A MITEL
PRODUCT
GUIDE

Unify OpenScape 4000

Volume 3: Feature Usage Examples

Service Documentation
03/2025

A31003-H31B0-S104-05-7620

Mitel

Notices

The information contained in this document is believed to be accurate in all respects but is not warranted by Mitel Europe Limited. The information is subject to change without notice and should not be construed in any way as a commitment by Mitel or any of its affiliates or subsidiaries. Mitel and its affiliates and subsidiaries assume no responsibility for any errors or omissions in this document. Revisions of this document or new editions of it may be issued to incorporate such changes. No part of this document can be reproduced or transmitted in any form or by any means - electronic or mechanical - for any purpose without written permission from Mitel Networks Corporation.

Trademarks

The trademarks, service marks, logos, and graphics (collectively “Trademarks”) appearing on Mitel’s Internet sites or in its publications are registered and unregistered trademarks of Mitel Networks Corporation (MNC) or its subsidiaries (collectively “Mitel), Unify Software and Solutions GmbH & Co. KG or its affiliates (collectively “Unify”) or others. Use of the Trademarks is prohibited without the express consent from Mitel and/or Unify. Please contact our legal department at iplegal@mitel.com for additional information. For a list of the worldwide Mitel and Unify registered trademarks, please refer to the website: http://www.mitel.com/trademarks.

© Copyright 2025, Mitel Networks Corporation

All rights reserved

Contents

1 General Information....38
1.1 Feature Usage Examples - Overview....38

2 System....50
2.1 AMO Authorizations in the PBX....50
2.1.1 Feature Description....50
2.1.2 Service Information....50
2.1.3 Generation (Example)....51
2.1.4 Relevant AMOs....51
2.2 AMO Caching....51
2.2.1 Overview....52
2.2.2 Service Information....53
2.2.3 AMO Usage....53
2.2.4 Relevant AMOs....53
2.3 Device Switching....54
2.4 DIMSU Warning....55
2.4.1 Feature Description....55
2.4.2 Service Information....55
2.4.2.1 Restrictions....56
2.4.2.2 Remarks....56
2.4.3 Generation (Example)....56
2.4.4 Relevant AMOs....57
2.5 Editing Line Circuits....57
2.5.1 Introduction....57
2.5.2 Adding an Incoming Line Circuit....58
2.5.2.1 Analog Line Circuits....58
2.5.2.2 Digital Line Circuits....58
2.5.3 Adding an Outgoing Line Circuit....60
2.5.4 Configuring MFC Trunks....60
2.5.5 Deleting a Trunk....61
2.6 Extended Access Protection (Login)....61
2.6.1 System Administrator Tasks....62
2.6.1.1 Initialized User IDs....62
2.6.1.2 Displaying User IDs....62
2.6.1.3 Adding New User IDs....62
2.6.1.4 Deleting User ID....65
2.6.1.5 Disabling and Enabling User IDs....65
2.6.1.6 Changing User ID Data....65
2.6.1.7 Configuring Preliminary Password....65
2.6.1.8 AMO PASSW....66
2.6.1.9 Logging MML Commands....66
2.6.1.10 Upload of Existing IDs with APS Exchange....67
2.6.1.11 User forgets password....68
2.6.2 User Possibilities....68
2.6.2.1 Opening a Session (login)....68
2.6.2.2 Closing a Session (logout)....69
2.6.2.3 Executional Rights....69
2.6.2.4 Changing Password....69
2.6.2.5 Forced Password Change....70
2.6.2.6 Displaying all Open Sessions....70
2.6.2.7 Cancelling and Deleting AMOs....70

2.6.2.8 Further Important Commands....71
2.7 Load Behavior of Flash Boards....71
2.7.1 Feature Description....71
2.7.2 Service Information....71
2.7.2.1 General Information....71
2.7.2.2 Load Behavior....72
2.7.3 Generation (Example)....72
2.7.3.1 CHANGE-ZANDE....72
2.7.3.2 DISPLAY-ZANDE....74
2.7.3.3 REGEN-ZANDE....75
2.7.4 Relevant AMOs....76
2.8 Loadware Variants....76
2.8.1 Feature Description....76
2.8.2 Configuration (Example)....77
2.8.3 Relevant AMOs....77
2.9 Logical Partitioning in OpenScape 4000 Systems....77
2.10 Optional Patches....80
2.10.1 General....80
2.10.2 Advantages....80
2.10.3 Procedure....80
2.10.4 Overview of the Assigned Flags....81
2.11 Partial Digit Analysis TWABE....81
2.12 Power Fail Interrupt Settings....82
2.13 Routes....83
2.13.1 Assign a route to the Telecommunications Service....83
2.13.2 Assign a Route to the Voice Mail Service....83
2.13.3 LCR Routes....84
2.14 Recovery of Peripheral Units....84
2.14.1 Feature Description....84
2.14.2 Feature Characteristics....84
2.14.3 User Interface: AMO PSTAT....85
2.14.4 Service Information....85
2.14.5 Relevant AMOs....85
2.14.6 Generation Information....86
2.15 Subscriber Search Enhancements....88
2.15.1 Feature Description....88
2.15.2 Generation (Example)....89
2.15.3 Relevant AMOs....91
2.16 System Backup & Restore....91
2.16.1 Important Information....91
2.16.2 Scenarios....91
2.17 Timers....95

3 OpenScape 4000 Assistant....97
3.1 Account Management....97

4 IP Solutions....98

5 Networking....99
5.1 Basic Networking Principles....99
5.1.1 General Information....99
5.1.2 Network Structures....99
5.1.2.1 Meshed network, fully meshed....99
5.1.2.2 Meshed network, partially meshed....100
5.1.2.3 Star-type network....101
5.1.3 Digit Analysis....101
5.1.4 Station Numbers and Codes throughout the Network....102

5.1.4.1 Feature description..... 102
5.1.4.2 Service information..... 103
5.1.4.3 Generation (example)..... 103
5.1.4.4 Relevant AMOs..... 104
5.1.5 Physical and Virtual Node..... 105
5.1.6 Node Number..... 107
5.1.6.1 Feature Description..... 107
5.1.6.2 Structure Overview..... 107
5.1.6.3 Service Information..... 108
5.1.6.4 Physical Node Number..... 108
5.1.6.5 Virtual Node Number..... 108
5.1.6.6 Fictive Node Number..... 108
5.1.6.7 Originating Node Number..... 108
5.1.6.8 Destination Node Number..... 108
5.1.7 Node Codes..... 109
5.1.7.1 Physical Node Code..... 109
5.1.7.2 Virtual Node Code..... 109
5.1.7.3 Area, Area Numbering..... 109
5.1.7.4 Area Code..... 109
5.1.7.5 Destination System Number..... 110
5.1.7.6 Route Code..... 110
5.1.7.7 Area-Code..... 110
5.1.7.8 Tie Code..... 110
5.1.7.9 Route..... 111
5.1.7.10 Path..... 111
5.1.7.11 Source Group..... 111
5.2 Alternate Routing on Error..... 111
5.2.1 Feature Description..... 111
5.2.1.1 Main goals for the alternate routing destination numbers in respect to OOS scenario..... 112
5.2.1.2 Usage of Alternate Routing Destination Numbers..... 113
5.2.1.3 Philosophy of loop avoidance in public/ OpenScape 4000/HiPath 4000 network..... 115
5.2.1.4 Philosophy of supplementation (parameter EXTNO)..... 116
5.2.1.5 Implausible conditions for supplementation..... 120
5.2.1.6 Plausibility of alternate routing destination numbers..... 122
5.2.1.7 Advisory output..... 122
5.2.2 User interface..... 125
5.2.2.1 Called subscribers (A,B,C,D,E of one source group), are not reachable, because of device/board errors..... 125
5.2.2.2 Called subscribers (A) is not reachable, because deactivated via AMO with additional request for alternate routing..... 127
5.2.2.3 Called HFA IP phones (A,B) are not reachable, because of IP errors, they moved their logon location from OpenScape 4000 to OpenScape Business/HiPath 3000..... 127
5.2.2.4 Called HFA IP phones are not reachable, because of system failure errors, they moved their logon location from OpenScape 4000 to another OpenScape 400 (MWI Indication)..... 130
5.2.2.5 Called subscribers (A,B) in its APs are in an APE situation to AP of the calling device..... 131
5.2.3 Service Information..... 133
5.2.3.1 General plausibility information..... 133
5.2.3.2 Special restriction information..... 134
5.2.4 Generation..... 134
5.2.5 Realization via A&S Tools: Screenshots and additional information..... 134
5.2.5.1 Realization via AMO: AMO or AMO Batch..... 134
5.2.6 Relevant AMOs..... 135
5.2.7 Frequently Asked Questions (FAQs)..... 137
5.3 Analog Trunking USA..... 144
5.3.1 Tie Traffic Features..... 145
5.3.1.1 TMEMUS..... 145

5.3.1.2 TMDNH - T1BOS for TIE Lines....169
5.3.2 Central Office Features....181
5.3.2.1 TMC16....182
5.3.2.2 TMDID....198
5.3.2.3 TMDNH -> T1BOS for Direct Inward Dialing Calls (T1DID)....207
5.3.2.4 TMDNH-T1BOS for Incoming and Outgoing Trunk Calls....219
5.3.3 Recorded Announcement Feature....232
5.3.3.1 Feature Description....233
5.3.3.2 Service Information....233
5.3.4 DIT Feature....233
5.3.4.1 Feature Description....233
5.3.4.2 User Interface....233
5.3.4.3 Service Information....233
5.3.4.4 Generation Example....234
5.3.4.5 Relevant AMOs....234
5.3.5 Supplemantary dialing....235
5.3.6 Real Dialtone from Central-Office....235
5.3.7 RealTrunk Group Overflow (Rerouting) for Trunks in the Event of a Fault....235
5.3.7.1 Original Trunk Group....236
5.3.7.2 Trunk Group Overflow....237
5.4 ANIF Automatic Number Identification....239
5.4.1 Feature Description....239
5.4.2 User Interface....239
5.4.3 Service Information....239
5.4.4 Generation....239
5.5 Automatic Node Topology Detection....241
5.5.1 Feature Description....241
5.5.2 User Interface....243
5.5.3 Service Information....243
5.5.3.1 Feature Activation / Deactivation....243
5.5.3.2 Feature Parameterization....244
5.5.3.3 What Information Does the Feature Provide?....246
5.5.3.4 Diagnostic options....247
5.5.3.5 Regenerate....247
5.5.3.6 Switching the Tie Trunk Circuits On and Off....248
5.5.4 Generation (Example)....248
5.5.5 Relevant AMOs....252
5.6 Cornet NQ Interworking with DPNSS1....254
5.6.1 Feature Description....254
5.6.2 Application Field of PBXXX....255
5.6.3 PBXXX Board....256
5.6.3.1 Partial Integration Ring Generator....256
5.6.3.2 Partial Integration DIUS2....257
5.6.3.3 Full-integration Solution....257
5.6.4 Feature Characteristics....258
5.6.5 Configuration....259
5.6.5.1 Software and Data Base Loading (Flash Loading Concept)....259
5.6.5.2 PBXXX Partial Integration RG....260
5.6.5.3 PBXXX Partial Integration (DIU-S2-Emulation)....260
5.6.5.4 PBXXX Full Integration....261
5.6.6 Administration/Maintenance....262
5.6.7 Service Information....262
5.6.8 AMO Information....262
5.6.9 Generation (Example)....268
5.6.9.1 Configuration of 'Partial-integration-RG' solution....268
5.6.9.2 Configuration of 'Partial-integration-DIUS2'....270

5.6.9.3 Configuration of 'Full-integration' solution....271
5.6.9.4 Usage of AMO LWCMD command interface:....273
5.6.9.5 COP for PBXXX....273
5.6.9.6 Protocol changes for PBXXX to activate the ASEG COP-parameter....274
5.6.9.7 COT Parameter for full integrated PBXXX....274
5.6.9.8 Changes of standard LWPAR....274
5.6.9.9 Remote registration of diversion....274
5.6.9.10 Class of Service Configuration....275
5.6.9.11 Trunk Identity Configuration....279
5.6.9.12 Routing DX calls to AC-Win MQ source keys....279
5.6.9.13 Automatic redirection to voicemail on busy....279
5.6.9.14 Trunking: Private ISDN networking....280
5.6.10 Relevante AMOs....280
5.7 CorNet-VN (CorNet Virtual Networking)....286
5.7.1 Feature Description....286
5.7.2 User Interface....287
5.7.3 Service Information....287
5.7.4 Generation (Example)....287
5.7.5 Relevant AMOs....288
5.8 Country-Specific Connection Techniques With Analog Trunks....289
5.8.1 Trunk Connections Versus Tie Connections....289
5.8.2 Dial Tone, Proceed-to-Send Signal on Outgoing Seizure....290
5.8.2.1 Real Dial Tone (Time-Dependent) From the Central Office (CO)....290
5.8.3 Dialing Procedures....290
5.8.4 End-of-Dial and Answer on Outgoing Seizure....291
5.8.4.1 End-of-Dial Code With '#'....291
5.8.4.2 End-of-Dial According to the 1A Procedure....291
5.8.4.3 End-of-Dial by Line Signal....292
5.8.4.4 End-of-Dial With First Call Charge Pulse....292
5.8.4.5 Effect of the End-of-Dial, Call Charge Pulse, and Answer Signals....292
5.8.4.6 Configuring the End-of-Dial Monitoring and End-of-Dial 1A Timers....293
5.8.5 Dial Tone on Incoming Seizure....293
5.8.6 Test Port....293
5.8.6.1 CH (Switzerland) Test Port....293
5.8.6.2 BEL Test Port....294
5.8.6.3 RSA Test Port....295
5.8.6.4 CIS Test Port....295
5.8.7 Extension of Trace Signaling for Calls to the Attendant Console....296
5.8.8 Line With Loop Start Signaling and Straightforward Direct Inward Dialing (DID)....296
5.8.8.1 Feature Description (User Interface)....296
5.8.8.2 Operational Configuration....297
5.8.8.3 Important Note on the 'Trunks'....297
5.8.9 Connection to External Systems Using TC-SL Link....297
5.8.9.1 Outgoing Calls (OpenScape 4000 to External System)....298
5.8.9.2 Incoming Calls (External System to OpenScape 4000)....298
5.8.9.3 Consultation Hold....298
5.8.9.4 Trunk Grounding/Trunk Flash....298
5.8.9.5 Picking Up a Consultation Hold in Straightforward Trunk Calls....299
5.8.9.6 Suffix Dialing To Remote System....300
5.8.9.7 Configuration Notes....300
5.8.10 Testing and Measuring the DTMF and MFC Signals....301
5.8.10.1 User Interface....301
5.8.11 Extension of the Override Features With Intercept....302
5.8.12 Reversed Charges Calls....303
5.9 Customer Groups, Shared Systems CUG....303
5.10 DTMF Dialing....304

5.10.1 Feature Description....304
5.10.1.1 Local DTMF functionality....304
5.10.1.2 Network DTMF functionality / Trunks that allow DTMF negotiation....305
5.10.1.3 Outgoing DTMF functionality / Trunks that do NOT allow DTMF negotiation....305
5.10.1.4 Incoming DTMF functionality....305
5.10.1.5 DTMF signaling in a conference concept....306
5.10.1.6 Feature Activation when DTMF signaling is active....307
5.10.1.7 Affected Talk States....307
5.10.1.8 Digit Displays....308
5.10.2 Service Information....308
5.10.3 Generation (example)....308
5.10.3.1 DTMF dialing configuration - Station basis....308
5.10.3.2 DTMF dialing configuration - Trunk (route) basis....308
5.10.4 Relevant AMOs....309
5.11 ECMA QSIG Protocol....311
5.11.1 General....311
5.11.2 QSIG Protocol Modifications....317
5.11.2.1 B-channel negotiation....318
5.11.2.2 Feature description....318
5.11.2.3 AMO Changes....318
5.11.2.4 Instructions for generation....319
5.12 EDSS1 System Interface / Trunk Interface....319
5.12.1 Feature Description....319
5.12.2 User Interface....320
5.12.3 Service Information....320
5.12.4 Relevant AMOs....324
5.12.5 Configuration of the EDSS1 system interface with Screening....331
5.12.5.1 Configuration of the system interface....331
5.12.5.2 A station number verification (screening)....332
5.12.5.3 EDSS1 Use Side....333
5.13 EURO-ISDN Exchange Interface....334
5.13.1 Direct Dialing In (DDI)....335
5.13.2 Calling and Connected Number Displays (CLIP/CLIR and COLP/COLR)....336
5.13.2.1 Format-dependent INS/STNO Modification in Incoming Direction....337
5.13.2.2 Format-dependent INS/STNO Modification in Outgoing Direction....338
5.13.2.3 COT-Parameters....338
5.13.2.4 Handling of extension numbers unknown to the exchange....338
5.13.2.5 Classes of service OVCAT and SPECAR....339
5.14 Features Available Throughout the Network....339
5.14.1 Call Forward/Forward No Reply....339
5.14.1.1 Call Forward/Forward No Reply with Open Numbering Scheme....340
5.14.1.2 Call Forward/Forward No Reply after Transfer....340
5.14.2 Announcement Unit....340
5.14.3 Override, Camp-On, Transfer....342
5.14.4 Public Address System....343
5.14.5 Dictation Equipment....343
5.14.6 Door Opener....343
5.14.7 Code Calling - Normal and Multiple Task....343
5.14.8 Callback....345
5.14.9 Speed Dialling Facility Throughout the Network (S0,S2)....345
5.15 ISDN Protocol Variants....346
5.15.1 Notes on protocol handling....346
5.15.2 Notes for upgrading a previous version....347
5.15.3 Example: Copying a protocol from the hard disk to the database....347
5.15.3.1 Current PRODE configuration should be regenerated first....347
5.15.3.2 Displaying the assignment of protocol variants to the protocols loaded in the database:....347

5.15.3.3 Deleting unwanted protocol variants..... 352
5.15.3.4 Querying the number (PDNO) under which the required protocol description (PDSTRING) is saved on the HD.....353
5.15.3.5 Copying the protocol from the hard disk to the database memory.....356
5.15.3.6 Assigning a protocol variant to the memory location in the database.....356
5.16 LCR (Least Cost Routing).....360
5.16.1 Routing with LCR.....361
5.16.1.1 Feature Description.....361
5.16.1.2 Service Information.....361
5.16.1.3 Generation (Example).....361
5.16.1.4 Relevant AMOs.....362
5.16.2 Routing with LCR with Rerouting.....362
5.16.2.1 Feature Description.....363
5.16.2.2 Service Information.....363
5.16.2.3 Generation (Example).....364
5.16.2.4 Relevant AMOs.....365
5.16.3 Routing via LCR with Internal Rerouting..... 365
5.16.3.1 Description of Features.....365
5.16.3.2 Service Information.....366
5.16.3.3 Generation (Example).....366
5.16.3.4 Relevant AMOs.....367
5.16.4 Central Office Breakout.....368
5.16.5 Indirect Network Access..... 369
5.16.6 Dialing Plan.....370
5.16.7 Closed Numbering NWLCR (without LCR DIALING PLAN).....370
5.16.7.1 Feature Description.....370
5.16.7.2 Service Information.....370
5.16.7.3 Generation (Example).....371
5.16.7.4 Relevant AMOs.....372
5.16.8 Open Numbering LCR (with LCR DIALING PLAN)).....374
5.16.8.1 Feature Description.....374
5.16.8.2 Service Information.....375
5.16.8.3 Generation (Example).....376
5.16.8.4 Relevant AMOs.....377
5.16.9 Time Based LCR (AMO LSCHD).....380
5.16.9.1 Feature Description.....380
5.16.9.2 Special Feature.....380
5.16.9.3 Service Information.....380
5.16.9.4 Generation (Example).....380
5.16.9.5 Relevant AMOs.....381
5.16.10 LCR Restriction Tables (AMO LDSRT).....382
5.16.10.1 Feature Description.....382
5.16.10.2 Service Information.....383
5.16.10.3 Generation (Example).....383
5.16.10.4 Relevant AMOs.....384
5.16.11 LCR Autorization PIN (Forced Authorization Code).....386
5.16.11.1 Feature Description.....386
5.16.11.2 User Interface.....387
5.16.11.3 Service Information..... 387
5.16.11.4 Generation (Examples)..... 388
5.16.11.5 Relevant AMOs..... 390
5.16.12 LCR Classes of Service LCOS (AMO COSSU)..... 392
5.16.12.1 Feature Description.....392
5.16.12.2 Service Information.....393
5.16.12.3 Generation (Example).....393
5.16.12.4 Relevant AMOs.....394

5.16.13 LCR Authorization Codes (AMO LAUTH)....394
5.16.13.1 Feature Description....394
5.16.13.2 Service Information....395
5.16.13.3 Generation (Example)....395
5.16.13.4 Relevant AMOs....395
5.16.14 LCR Source Dependant (AMO KNLCR)....396
5.16.14.1 Feature Description....396
5.16.14.2 Service Information....398
5.16.14.3 Generation (Example)....398
5.16.14.4 Relevant AMOs....399
5.16.15 LCR Source Groups (AMO LPROF)....399
5.16.15.1 Feature Description....399
5.16.15.2 Service Information....399
5.16.15.3 Generation (Example)....401
5.16.15.4 Relevant AMOs....401
5.16.16 LCR Dial Rules (AMO LODR)....402
5.16.16.1 Feature Description....403
5.16.16.2 Service Information....403
5.16.16.3 Generation (Example)....403
5.16.16.4 Relevant AMOs....404
5.16.17 LCR Traffic Dependant (Line Reservation AMO BUEND)....404
5.16.17.1 Feature Description....404
5.16.17.2 Service Information....406
5.16.17.3 Generation (Example)....406
5.16.17.4 Relevant AMOs....407
5.16.18 Inserting/Removing in a Queue (AMO LDAT)....407
5.16.18.1 Interrupting B Channel Search with Route Advance Delay....408
5.16.18.2 Off-Hook Queue....411
5.16.18.3 ON-hook Queue....413
5.16.19 LCR Generation....415
5.17 LCR Rerouting....416
5.17.1 Internal Rerouting Disabled....416
5.17.2 External Rerouting Disabled....418
5.18 MFC-R2 Signaling....419
5.18.1 Introduction to MFC-R2 Signaling....419
5.18.1.1 Compelled Signaling According to MFC-R2....420
5.18.1.2 Example of a Connection Set-Up....420
5.18.1.3 The Meaning of the MFC-R2 Signals According to UIT Q.441....421
5.18.1.4 MFC-R2 Signals and MFCTA....422
5.18.2 Hardware....422
5.18.2.1 Circuits....422
5.18.2.2 SIU for MFC-R2....423
5.18.2.3 Trunk - SIU Connection....423
5.18.3 General Information on the MFC Tables....423
5.18.3.1 Identification With Master Number (Outgoing Seizure)....423
5.18.3.2 Counter When Retrieving the A-Number (Terminating Seizure)....427
5.18.3.3 Identification With MFC-R2 (General)....427
5.18.3.4 Use Identified Calling Number for Redial....429
5.18.3.5 Acknowledged Identification Request (HUNGARY)....429
5.18.3.6 Handling the Signals in Generated Connections....430
5.18.3.7 Note on Message F5607 MFC-MONITORING....430
5.18.3.8 Monitoring the MFC Signal Exchange....433
5.18.3.9 Dialing Monitoring Combined With Intercept to Attendant Console....433
5.18.3.10 Tracing End-of-Dial Without Charges....433
5.18.3.11 END TO END Connections....434
5.18.3.12 Configuration Notes....434

5.18.3.13 New User Categories for Private Networks (With MFC Signaling)....435
5.18.3.14 Using the ITR (Internal Traffic Restriction Group) With MFC-R2....436
5.19 National ISDN Basic Rate Interface (NI BRI)....436
5.19.1 Feature Description....436
5.19.2 User Interface....436
5.19.3 Service Information....437
5.19.3.1 Connecting NI BRI Data Devices via the SLMQ3 Card....437
5.19.3.2 Connecting NI BRI Date Devices via the SLMO Card....438
5.19.3.3 NI BRI Partner Products Supported by OpenScape 4000....440
5.19.4 Generation (Example)....441
5.19.4.1 First-Time Loading of the NI BRI Protocol Data....442
5.19.4.2 Connecting NI BRI Data Devices via the SLMQ3 Card....442
5.19.4.3 Connecting NI BRI Data Devices via the SLMO Card....443
5.19.5 Relevant AMOs....444
5.20 Network Loops....446
5.20.1 Feature Description....446
5.20.2 Methods of Preventing Network Loops....446
5.20.3 Service Information....447
5.20.4 Generation (Example)....447
5.20.4.1 Network with Open Numbering; Alternate Routing with Complete Set of Prefix Codes....448
5.20.4.2 Network with Open Numbering; Alternate Routing with one Prefix Code....449
5.20.4.3 Network with Closed Numbering....449
5.20.5 Relevant AMOs....450
5.21 Number Modification....451
5.21.1 General Description and Rules....451
5.21.1.1 Summary....453
5.21.1.2 Phone numbers....455
5.21.1.3 US EPNP....458
5.21.1.4 Number signaling....460
5.21.2 Examples for the configuration of the number modification....468
5.21.2.1 One-level network (only Level 0)....468
5.21.2.2 Multi-level network....483
5.21.2.3 Open-numbered heterogeneous network....497
5.21.2.4 NNO Determination....518
5.21.3 Relevant AMOs....520
5.22 PIN and Follow-Me Network-Wide....523
5.22.1 Feature Description....523
5.22.2 Functions / Restrictions when using a PIN network-wide / external....525
5.22.3 Terminals....526
5.22.3.1 Activating and Deactivating a Network-Wide PIN....526
5.22.3.2 Identification via "APIN" Code (Manual PIN)....526
5.22.4 Identification via Chip Card....528
5.22.5 Input Procedure for Network-Wide Follow-Me....529
5.22.5.1 Follow-Me Activation/Deactivation with the FWD key (PIN/Chip Card Active)....530
5.22.5.2 Follow-Me Activation/Deactivation by Dialling the Codes for "Variable Call Forwarding On/Off" (PIN/Chip Card Active)....530
5.22.6 Follow-Me Activation/Deactivation via Service Menu:....530
5.22.6.1 Activating Follow-Me via the Service Menu....530
5.22.6.2 Deactivating Follow-Me via the Service Menu....532
5.22.7 PIN Deactivation....534
5.22.8 Network-Wide PIN and Follow-Me in 1 Step....535
5.23 Preventing Connections....535
5.23.1 Single Level Network....535
5.23.2 Multi Level Network....536
5.24 Public PRI Networking....536
5.24.1 Feature description....537

5.24.1.1 Supplementary Services....537
5.24.2 User Interface....540
5.24.2.1 CND (Calling Name Delivery)....540
5.24.2.2 ISDN-PRI RN (ISDN-PRI Redirecting Number)....540
5.24.3 Service Information....540
5.24.4 Generation....540
5.24.4.1 Calling Services....541
5.24.4.2 B-Channel Management....541
5.24.4.3 ACPN (Additional Calling Party Number)....542
5.24.4.4 CND (Calling Name Delivery)....542
5.24.4.5 ISDN-PRI RN (ISDN-PRI Redirecting Number)....542
5.24.5 Relevant AMOs....542
5.25 Public Network Exchange Signalling DTMF (Suffix Dialling)....546
5.26 REFTA Synchronization....547
5.26.1 Network Synchronization Plan....549
5.26.1.1 Clock Hierarchy Plan....549
5.26.2 Definition of Hierarchy Levels....550
5.26.2.1 Synchronous Private Networks....550
5.26.2.2 Plesiochronous or Pseudosynchronous Private Networks....551
5.26.2.3 Limiting Level Numbers....551
5.26.2.4 Reducing Level Numbers....551
5.26.3 Connections....553
5.26.3.1 Synchronization Interfaces....553
5.26.3.2 Clock-Transparent Connections....553
5.26.3.3 Connections with External Clock....554
5.26.4 AMO REFTA....554
5.26.4.1 Value Range of Priorities....555
5.26.4.2 Priority Assignment....556
5.26.4.3 Networks with Several Masters....556
5.26.4.4 AMOs LWPAR & SYSPAR....557
5.26.4.5 Clock Generator and Front Reference....557
5.26.4.6 Changes with cPCI Control....557
5.26.5 Selection of Clock Generators....558
5.26.5.1 Exactness of Free-Run Mode....558
5.26.5.2 Performance for Network Operation/Normal Clock Generators....558
5.26.5.3 Hold Over Mode....559
5.26.5.4 ATM....560
5.26.5.5 External Clock Box (AECB, AICB, etc.) for OpenScape 4000....560
5.26.5.6 Network Clock Supply....560
5.26.5.7 SDH....561
5.26.5.8 HiPath Cordless (CMI)....562
5.26.5.9 Network-Wide Synchronization for Cordless (ISS)....562
5.26.5.10 ATM Interface (STMA Board)....563
5.26.5.11 Special Cases....563
5.26.5.12 Front Reference....564
5.26.5.13 S0 Interface not Permanently Active....564
5.26.5.14 Setting the REFTA Error Counter to 16 000....565
5.26.5.15 T4 Clock Output/Previously T3ab, APT3 Adapter....565
5.26.6 Notes/Experience....565
5.26.7 Abbreviations....566
5.27 Restricted Call Duration for Transit Calls....568
5.27.1 Feature Description....568
5.27.2 Service Information....568
5.27.3 Generation (Example)....568
5.27.4 Relevant AMOs....569
5.28 Route Optimization....569

5.28.1 Feature Description....569
5.28.2 Special Notes....571
5.28.3 Restrictions....573
5.28.4 Service Information....573
5.28.5 Generation (Example)....574
5.28.5.1 Heterogeneous Network....574
5.28.5.2 Network with Several Areas....579
5.28.6 Relevant AMOs....581
5.29 S0/S2 Trunk Parameterization....583
5.30 Satellite Paths Limiting....585
5.31 Screening on the EDSS1 Trunk Interface....586
5.31.1 Feature Description....586
5.31.2 Overview....587
5.31.3 Screening....588
5.31.3.1 Allocate memory....588
5.31.3.2 Configure screening patterns....588
5.31.4 CLIP/CLIR, COLP/COLR....592
5.31.5 Presentation....592
5.32 Single Point of Access (SPoA)....594
5.32.1 Description of the product....594
5.32.1.1 SPoA....594
5.32.1.2 Option SESAP....595
5.32.1.3 SIRA....595
5.32.2 SPoA Router....596
5.32.3 Possible SPoA scenarios and network access on customer site....596
5.32.3.1 Remote Connectivity via Customer own SPoA (ISDN / DSL and VPN)....596
5.32.3.2 Remote Connectivity via supported SPoA Router....596
5.32.4 Configuration of the Huawei - Routers....597
5.32.4.1 Display and Connectors....598
5.32.4.2 Configuration....598
5.33 Transmission and Loss Plan....603
5.33.1 Overview....603
5.33.2 Service Information....604
5.33.3 Generation (Example)....604
5.34 Trunk Access with the STMA When Using the ATM Networking V2.0 Feature....606
5.34.1 Feature Description....606
5.34.2 Service Information....606
5.34.3 Example Configuration....607
5.35 Trunk to Trunk Supervised Connection....607
5.35.1 Overview....607
5.35.2 Feature Description....608
5.35.3 User Interface....608
5.35.4 Service Information....609
5.35.5 Generation (Example)....609
5.35.6 Relevant AMOs....609
5.36 Virtual Numbering (VNR)....610
5.36.1 Introduction....610
5.36.1.1 Prerequisites....610
5.36.1.2 Scenarios....611
5.36.2 Properties....612
5.36.2.1 Station Availability....613
5.36.2.2 Feature Principles....614
5.36.2.3 Special Features and Restrictions....614
5.36.2.4 Limiting Values....617
5.36.2.5 Converting to VNR....617
5.36.3 Generation....620

5.36.3.1 Tasks Involved in Switching to VNR....621
5.36.3.2 Network Integration....621
5.36.3.3 Description of the AMO Application....622
5.36.3.4 Connecting External Systems....642
5.36.4 OpenScape 4000 Manager....642
5.36.4.1 Configuration....642
5.36.4.2 Modifying the User Interface....643
5.36.5 AMO Interrelationships....644
5.36.5.1 Attendant Console Groups....644
5.36.5.2 VNR with Code Calling/Multiple Code Calling (CC/MCC)....646
5.36.5.3 VNR with Alternate Routing on Error (ARoE)....648
5.36.5.4 Applications....648
5.36.5.5 Modified Display for E.164....651
5.36.6 Relevant AMOs....651
5.37 Voice Compression....661
5.37.1 General....662
5.37.1.1 Task of the Feature....662
5.37.1.2 The Voice Compression Board....662
5.37.1.3 Description of Synonyms which are Used....663
5.37.1.4 Functional Overview....663
5.37.1.5 VCM Transit Overview....665
5.37.1.6 Administration Overview....666
5.37.2 Basic Administration....666
5.37.2.1 Allocation of Needed Memory....666
5.37.2.2 Costumer Feature List....667
5.37.2.3 VCM Board Configuration....667
5.37.2.4 Class of Trunk Configuration....667
5.37.2.5 Trunk Group Configuration....667
5.37.2.6 Trunk Configuration....668
5.37.2.7 Activation/Deactivation of Boards and Circuits....669
5.37.2.8 LCR Configuration....669
5.37.2.9 Voice Compression Configuration....670
5.37.2.10 Deactivation/Activation of Voice Compression....670
5.37.3 Extended Administration....672
5.37.3.1 Mixed Routes (compressed/not compressed)....672
5.37.3.2 No Voice Compression for Particular Subscribers....674
5.37.3.3 More Data Channels or More Speech Channels....677
5.37.3.4 Route Optimization....677
5.37.4 Error Messages....677

6 INCDR (Internal and network-wide call detail recording) - Basic Information....682
6.1 Call Detail Recording....682
6.1.1 General Information....682
6.1.2 Call Detail Recording Features....683
6.1.3 Call Detail Recording Overload Behavior....684
6.1.4 Relevant AMOs for Call Detail Recording....685
6.1.5 Cross-References between AMOs and the AMO SELG....692
6.1.6 Types of Call Detail Recording....692
6.1.6.1 Internal Traffic....692
6.1.6.2 Incoming Trunk Calls and Tie Trunk Traffic....694
6.1.6.3 Outgoing Tie Trunk Traffic (Networking)....696
6.1.6.4 Call Detail Recording for Networking....698
6.1.6.5 Network-Wide Call Detail Recording With Call ID....698
6.1.6.6 Euro ISDN Trunk....699
6.1.7 Call Charge Display on the Digite....700
6.1.8 Types of Charge Calculation....701

6.1.9 Data Recording ... 701
6.1.10 Data Selection ... 702
6.1.11 Selection Group Operating States ... 704
6.1.12 Validity Check of the Selection Entries ... 705
6.1.13 Data Output ... 705
6.1.13.1 Immediate Output ... 705
6.1.13.2 Data Output on Demand ... 707
6.2 Call Detail Transmission ... 708
6.2.1 Requirements for Call Detail Transmission to the DPS ... 709
6.2.2 Transmission of Individual Call Data ... 709
6.2.3 Message Sequences for Transmitting Individual Call Data ... 710
6.2.3.1 Example configuration of an immediate DPS output over customer LAN ... 711
6.2.4 Messages When Transmitting Individual Call Data ... 713
6.2.4.1 Message "Send CDR Information" ... 714
6.2.4.2 Message "CDR information block on demand" or "CDR information block with immediate output" ... 715
6.2.4.3 Message "Good/Bad CDR information end" ... 718
6.2.4.4 Message "CDR information processed" ... 719
6.2.4.5 Message "CDR data retrieval request" ... 720
6.2.4.6 Message "Repeat the same call data record (for immediate output only)" ... 720
6.2.4.7 Verification of Connection ("Heartbeat") ... 721
6.2.5 Types of Elements When Transmitting Call Detail Data ... 722
6.2.5.1 Elements with a Fixed Specification ... 723
6.2.5.2 Configurable Elements ... 724
6.3 Call Detail Information for Heterogeneous Networks ... 741
6.3.1 Call Charge Display Parameters in AMO COT and AMO COSSU ... 741
6.3.2 Charge-Related COT Parameters ... 741
6.3.2.1 AOCC ... 742
6.3.2.2 IICB ... 742
6.3.2.3 SNBE ... 742
6.3.2.4 IGID ... 742
6.3.2.5 TRSC ... 742
6.3.2.6 DPRE ... 743
6.3.2.7 ICZO and ICZL ... 743
6.3.2.8 CCTN ... 743
6.3.2.9 DFNN and LWNC on Tie Trunks to an Expression 450 ... 743
6.3.3 Charge-Related TDCSU Parameters ... 744
6.3.3.1 ZONE ... 744
6.3.4 Charge-Related FEASU Parameters ... 744
6.3.4.1 DISCHNW and CDROGNW ... 744
6.3.5 Charge-Related LDAT Parameters ... 744
6.3.5.1 LATTR Parameter NOCHDISP ... 744

7 Internal and network-wide call detail recording (INCDR) - Usage Examples ... 745
7.1 CDRe - Call Detail Recording enhanced ... 745
7.1.1 Specification ... 745
7.1.2 Description ... 745
7.1.3 Modified Cost Unit Assignment Concept ... 746
7.1.4 Special Features ... 746
7.1.5 User Interface ... 747
7.1.6 Service Information ... 747
7.1.7 AMOs ... 747
7.1.7.1 Enabling and Disabling Call Data Recording Enhancements ... 747
7.1.7.2 Important Fields in the Call Detail Record ... 747
7.1.7.3 Modified Cost Unit Assignment Concept ... 764
7.1.7.4 Processing Sequence for Entries in DEFPP ... 765

7.1.7.5 Changes in the AMO GEFE....766
7.2 Call Detail Recording enhanced Traffic....769
7.2.1 Feature Description....769
7.2.2 User Interface....769
7.2.3 Service Information....770
7.2.4 Generation....771
7.2.5 Relevant AMOs....774
7.3 Call Detail Recording - Account Code....776
7.3.1 Feature Description....776
7.3.2 User Interface....776
7.3.3 Service Information....777
7.3.4 Generation (Example)....777
7.3.5 Relevant AMOs....780
7.4 Call Charge Data Display....781
7.4.1 Call Charge Data Display from the CDRS File....781
7.4.2 Call Charge Data Display on Supplementary Device....782
7.5 Call Charge Data - Immediate Output....783
7.5.1 Immediate Output to GC 3001 A....783
7.5.2 Immediate Output to CDRC1 File on HD....785
7.5.3 Immediate Output to File Transfer File on HD....786
7.5.4 Immediate Output to Magnetic Tape Device....787
7.5.5 Immediate Output to PT80i (Optional Device)....789
7.6 Call Charge Output....790
7.6.1 Output Format 1....790
7.6.2 Charge Output at the ATND (CDRATND)....792
7.7 Call Charge Recording-Elapsed Time Display....794
7.7.1 Overview....794
7.7.2 Feature Description....794
7.7.3 User Interface....795
7.7.4 Service Information....795
7.7.5 Generation (Example)....795
7.7.6 Relevant AMOs....795
7.8 Central Configuration....795
7.8.1 Flexible Memory Management....796
7.8.2 Central System Data....796
7.8.2.1 Affected AMOs....796
7.8.2.2 Configuration Commands for Central System Data....798
7.8.3 Tariff Group Tables....799
7.8.4 Tariff Tables....800
7.8.5 Call Data Recording for Outgoing Connections....807
7.8.6 Call Data Recording for Incoming Connections....811
7.8.7 Call Data Recording for Internal Node Connections....814
7.8.8 Call Charge Display at the Attendant Console....816
7.8.9 CDR Records, Central and per Station....816
7.8.10 Examples....817
7.8.10.1 Internal Call Data Recording in the Network....817
7.8.10.2 Tie Traffic with Incoming Charges and Trunk Traffic in Transit....823
7.9 Charge Pulse Metering & Sending to Analog Stations....826
7.9.1 Feature description....826
7.9.1.1 Operating limitations....827
7.9.1.2 Areas of application....827
7.9.1.3 Activating the feature....827
7.9.2 Service Information....827
7.9.2.1 Charges for analog stations....827
7.9.2.2 Increasing the line length....828
7.9.3 Generation Notes....828

7.9.3.1 AMOs for charges on analog stations....828
7.9.3.2 FEASU - Enabling metering pulse sending....829
7.9.3.3 BCSU - Configuring an SLMAR board....829
7.9.3.4 XAPX - Managing classes of service....829
7.9.3.5 SCSU - Configuring an SLMAR station....829
7.9.3.6 TTBL- Configuring the tariff table for pulse sending....830
7.9.3.7 TTBL - Managing the tariff group table....830
7.9.3.8 VBZGR - Managing the internal traffic restriction group zone matrix....830
7.9.3.9 GEFE - Managing the CDR parameter....831
7.9.3.10 ZAND - Managing central system data....831
7.9.3.11 PTIME - Managing timers for peripherals....831
7.9.4 Forwarding charges from the CO....832
7.9.4.1 Configuring the board....832
7.9.4.2 Feature enabled....832
7.9.4.3 Output loadware version of SLMAR....832
7.9.4.4 Activating call detail recording....833
7.9.4.5 PUPHON tariff table....833
7.9.4.6 Station entries....833
7.9.5 Configuring internal call detail recording....833
7.9.5.1 Configuring internal zones for call detail recording....833
7.9.5.2 Assigning type public telephone....833
7.9.5.3 Enabling internal call detail recording....833
7.9.5.4 Tariff table for metering pulse sending....833
7.9.5.5 Tariff tables for public telephone....833
7.10 Default Values....834
7.10.1 Country-Specific Parameters....835
7.10.2 Connection Limits Table....836
7.10.3 Output Text Tables....836
7.10.4 File Sizes....838
7.11 DPS Interface Data....838
7.12 INFO 2000 Outcalls....840
7.13 Per-Second Invoicing with Prices in 1/100000 Currency Units....841
7.14 Station Number Modification....864
7.14.1 Feature Description....864
7.14.2 Service Information....864
7.14.3 Generation (Example)....864

8 Groups....866
8.1 Audible Ringing on Rollover Lines....866
8.1.1 Feature Description....866
8.1.2 User Interface....866
8.1.3 Service Information....867
8.1.4 Generation (Example)....867
8.1.5 Relevant AMOs....867
8.1.6 Interrelationship with other Features....868
8.2 Call Pickup....868
8.2.1 Directed Call Pickup....868
8.2.2 Local Call Pickup Groups....869
8.2.2.1 General Information....869
8.2.2.2 Service Information....870
8.2.2.3 Pickup Group Call....871
8.2.2.4 Generation (Example)....872
8.2.2.5 Other Remarks....876
8.2.3 Network-wide Call Pickup....876
8.2.3.1 Network-wide Call Pickup Groups....877
8.2.3.2 Supported Features....877

8.2.3.3 Directed Call Pickup..... 879
8.2.3.4 Service Remarks.....879
8.2.3.5 Generation Notes.....880
8.2.3.6 AMO Changes..... 883
8.3 CHESE - Integrated Executive/Secretary System..... 885
8.3.1 Assign a Secretary Telephone.....888
8.3.2 Assignment of the Messenger Facility.....888
8.4 CHESE/ Team Functions Network-wide.....888
8.4.1 Feature Description.....889
8.4.1.1 General Information..... 889
8.4.1.2 Team Functions.....890
8.4.1.3 Network-wide Team in Combination With Additional Features.....892
8.4.1.4 Comparison of Current Chese With Network-wide Team Function..... 893
8.4.1.5 Service Information..... 896
8.4.2 Relevant AMOs..... 899
8.4.2.1 Overview..... 900
8.4.2.2 Detail..... 901
8.4.2.3 Flowchart for Chese 1/1 over 2 Systems.....904
8.4.3 Generation (Examples)..... 905
8.4.3.1 Two Executives, One Secretary, Spread Over 3 Systems.....906
8.4.3.2 Two Executives and Two Secretaries, Spread Over 3 Systems..... 911
8.5 Class of Service Switch-Over COSX..... 920
8.6 COM Group Call.....921
8.6.1 Feature Overview.....921
8.6.2 Feature Description.....921
8.6.3 User Interface.....922
8.6.4 Service information.....922
8.6.5 Generation (Example)..... 922
8.6.6 Relevant AMOs..... 923
8.7 COM Group Speaker Call -Two-Way.....923
8.7.1 Overview.....924
8.7.2 Feature Description.....924
8.7.3 User Interface.....924
8.7.4 Generation (Example)..... 924
8.7.5 Relevant AMOs..... 925
8.8 Hunt Group..... 926
8.8.1 Feature Description.....926
8.8.2 Service Information..... 926
8.8.3 Feature Interactions for Hunt Group with Parallel Ringing..... 928
8.8.4 Generation (Example)..... 930
8.8.5 Relevant AMOs..... 933
8.8.6 Stimulus display phones (Optiset, Optipoint, lower Openstage versions, CP200) configured as master..... 935
8.9 Hunt Group Network-wide.....935
8.9.1 Expansion of the Call Queue Overflow Function.....936
8.9.2 Generation.....939
8.9.3 Example.....940
8.10 Keyset Preview Key..... 941
8.10.1 Overview.....941
8.10.2 Feature Description.....942
8.10.3 User Interface.....942
8.10.4 Service Information..... 944
8.10.5 Generation (Example)..... 944
8.10.6 Relevant AMOs..... 944
8.11 Integrated Key Functionality / Multi Line Access.....944
8.11.1 Feature Description..... 945

8.11.1.1 Brief Description of Keyset Features....946
8.11.1.2 Display of incoming calls on secondary lines of a keysystem....948
8.11.1.3 Visual Call Forwarding notification for key system lines....948
8.11.1.4 Keysystem Flowchart....949
8.11.2 Trading-Executive in a Keysystem....950
8.11.2.1 Description....950
8.11.2.2 Installing a local Keysystem with the new features....951
8.11.2.3 Direct Station Selection network wide....965
8.11.3 Relevant AMOs....975
8.11.4 High priority lines in a keysystem....976
8.12 Parallel Ringing - One Number Service (ONS)....976
8.12.1 General Information....977
8.12.2 Service Information....978
8.12.2.1 General Notes....978
8.12.2.2 Interactions with other Features....978
8.12.2.3 Notes on Configuration....981
8.12.2.4 Restrictions....982
8.12.2.5 ONS Groups with SIP Subscriber as Master/Slave....983
8.12.3 Generation (Example)....987
8.12.3.1 Configuration steps....987
8.12.3.2 Example with Auxiliary Device....988
8.12.3.3 Example with SIP Subscriber (Master and Slave)....990
8.12.4 Relevant AMOs....991
8.13 Personal Device Group....993
8.13.1 Feature Description....993
8.13.2 Service Information....994
8.13.2.1 Supported Devices....994
8.13.2.2 Restrictions....994
8.13.2.3 Supported Features....994
8.13.3 Generation (Example)....1001
8.13.4 Relevant AMOs....1002
8.14 Speaker Call - One-Way - Broadcast....1003
8.14.1 Overview....1003
8.14.2 Feature Description....1004
8.14.3 User Interface....1004
8.14.4 Service information....1005
8.14.5 Generation (Example)....1005
8.14.6 Relevant AMOs....1005

9 Non Voice....1006
9.1 Fax Machine....1006
9.1.1 Feature Description....1006
9.1.2 Service Information....1006
9.1.3 Generation (Example)....1006
9.1.4 Relevant AMOs....1007
9.2 Number Conversion....1007
9.2.1 Feature Description....1007
9.2.2 Example of Station Number Conversion....1008
9.2.3 Combination Code (FAX, DTE)....1009
9.2.4 Relevant AMOs....1009

10 Terminals....1011
10.1 Automatic Number Identification (ANI)....1011
10.1.1 Feature Description....1011
10.1.2 Service Information....1011
10.1.3 Generation....1011

10.1.4 Relevant AMOs.... 1011
10.2 Autoset Relocate.... 1011
10.2.1 General Information.... 1012
10.2.1.1 Terms Used.... 1013
10.2.1.2 Prerequisites for Signing Off and On.... 1013
10.2.2 Devices and Configurations which support Autoset Relocate.... 1014
10.2.2.1 Anate.... 1014
10.2.2.2 Digital System Telephone (without second Telephone).... 1014
10.2.3 Devices which do not support Autoset Relocate.... 1014
10.2.4 AMOs Usage Examples for Autoset Relocate.... 1015
10.2.4.1 Preparations.... 1015
10.2.4.2 Signing Off and On via AMO.... 1015
10.2.4.3 Signing Off and Enabling PENs.... 1016
10.2.4.4 Configuring Users/Stations with SIGNED_OFF Status (without PEN).... 1017
10.2.4.5 Display Signed Off Users and PENs.... 1017
10.2.4.6 Emergency calls.... 1018
10.3 Babyphone.... 1019
10.3.1 Feature Description.... 1019
10.3.2 Service Information.... 1019
10.3.3 User Interface and Operation.... 1019
10.3.3.1 Activation.... 1019
10.3.3.2 Deactivation.... 1019
10.3.3.3 Monitoring the room.... 1019
10.3.4 Generation (Example).... 1019
10.3.5 Relevant AMOs.... 1020
10.4 Block Dialing.... 1020
10.4.1 Feature Description.... 1020
10.4.2 Service Information.... 1020
10.4.3 Generation.... 1021
10.4.4 Relevant AMOs.... 1021
10.5 Buzz.... 1023
10.5.1 Feature Description.... 1024
10.5.2 User Interface.... 1024
10.5.3 Service Information.... 1024
10.5.4 Generation (Example).... 1025
10.5.5 Relevant AMOs.... 1025
10.6 Call Forwarding.... 1025
10.6.1 Feature Description.... 1025
10.6.2 User Interface.... 1027
10.6.2.1 Variable Call Forwarding.... 1027
10.6.2.2 Fixed Call Forwarding.... 1028
10.6.2.3 System Call Forwarding.... 1028
10.6.2.4 Call Forwarding/Call Forwarding Busy.... 1029
10.6.2.5 Call Forwarding Unconditional.... 1029
10.6.2.6 Chaining FWD Types.... 1029
10.6.3 Generation (Example).... 1030
10.6.3.1 AMO ACTDA.... 1030
10.6.3.2 AMO COSSU.... 1031
10.6.3.3 AMO COT.... 1031
10.6.3.4 AMO DIMSU.... 1032
10.6.3.5 AMO TDCSU.... 1032
10.6.3.6 AMO WABE.... 1032
10.6.3.7 AMO ZAND.... 1036
10.6.3.8 AMO ZIEL.... 1037
10.6.4 Relevant AMOs.... 1038
10.7 Call Forward no Reply (CFNR).... 1041

10.7.1 Call Forward no Reply after Transfer..... 1041
10.7.1.1 Feature Description.....1041
10.7.1.2 Service Information..... 1041
10.7.1.3 Interaction with other Features..... 1042
10.7.2 Call Forward No Reply and Rerouting.....1042
10.7.2.1 Feature Description.....1042
10.8 Call Hold analog.....1042
10.8.1 Overview.....1042
10.8.2 Feature Description.....1042
10.8.3 User Interface.....1043
10.8.4 Service Information..... 1043
10.8.5 Generation (Example)..... 1044
10.8.6 Relevant AMOs..... 1044
10.9 Call ID (Name and Number) on Analog Port with PRI NI2 Calls.....1044
10.9.1 Feature Description..... 1044
10.9.2 Generation (Example)..... 1045
10.9.3 Relevant AMOs..... 1045
10.10 Calling Line Identification (CLI) Enhancements..... 1045
10.10.1 Feature Description..... 1046
10.10.2 Realization.....1046
10.10.3 Prerequisites.....1047
10.10.4 Service Information..... 1048
10.10.5 Generation.....1049
10.10.6 Relevant AMOs..... 1050
10.11 Calling Line Identification (CLI) Restriction..... 1053
10.11.1 Feature Description..... 1053
10.11.2 Service Information.....1054
10.11.3 Generation (Example)..... 1054
10.11.4 Relevant AMOs..... 1055
10.11.5 Further Features in Connection with CLIR..... 1056
10.11.5.1 Display Control for a Single Call.....1056
10.11.5.2 Display Control for a Replacement Number for Calls to an External Station.....1057
10.11.5.3 Display Control (using parameters DISPTGNA/INDNADIS).....1059
10.11.5.4 Exceptions to Honoring Presentation Restriction Indication..... 1061
10.11.5.5 Display Suppression for Analog and T1 Trunks (only US)..... 1062
10.11.6 CLIR on an Individual Subscriber Basis..... 1065
10.12 Calling Line Identification (CLI) Translation..... 1065
10.12.1 Feature description.....1065
10.12.2 Generation (Example)..... 1066
10.13 Call Log for OptiPoint, OpenStage and CP phones..... 1067
10.13.1 Feature Description.....1067
10.13.2 Feature Characteristics..... 1068
10.13.3 Service Information..... 1069
10.13.4 Generation.....1069
10.13.4.1 Call log configuration..... 1069
10.13.4.2 Set up menu option: delete call log.....1069
10.13.4.3 Setup: save originating number on transfer..... 1069
10.13.4.4 Protection of the individual call log.....1070
10.13.5 Relevant AMOs..... 1070
10.14 Call Parking..... 1070
10.14.1 System Park.....1071
10.14.1.1 Feature Description.....1071
10.14.1.2 User Interface..... 1071
10.14.1.3 Service information..... 1073
10.14.2 Directed Call Parking..... 1073
10.14.2.1 Feature Description.....1073

10.14.2.2 User Interface ... 1074
10.14.2.3 Feature Operation by User Terminal ... 1074
10.14.2.4 Service Information ... 1077
10.14.2.5 Interworking between devices ... 1077
10.14.3 Call Park Within a Pickup Group ... 1078
10.14.3.1 User Interface ... 1078
10.14.4 Generation (Example) ... 1078
10.14.4.1 System Park ... 1078
10.14.4.2 Directed Call Park ... 1079
10.14.4.3 Park within a Pickup group ... 1080
10.14.5 Relevant AMOs ... 1080
10.15 Connect Key ... 1081
10.15.1 Feature Description ... 1081
10.15.2 User Interface ... 1082
10.15.3 Service Information ... 1082
10.15.4 Generation (Example) ... 1082
10.15.5 Relevant AMOs ... 1082
10.16 Controlled Trunk and Line Selection ... 1082
10.16.1 Feature Description ... 1083
10.16.2 Effects on other Features ... 1084
10.16.3 User Interface ... 1084
10.16.3.1 Data editing for CorNet-NQ ... 1084
10.16.3.2 Provision of path selection ... 1087
10.16.3.3 System Reactions ... 1087
10.16.4 Service Information ... 1088
10.16.5 Generation (Example) ... 1089
10.16.5.1 Relevant AMOs ... 1090
10.17 Data Security at the Terminal ... 1090
10.17.1 Feature Description ... 1090
10.17.2 Service Information ... 1091
10.17.3 Generation (Examples) ... 1091
10.17.3.1 Query whether the required protective parameters have been set ... 1092
10.17.3.2 Set the required (e.g. all) protective attributes ... 1092
10.17.3.3 Reset the corresponding protective attributes ... 1092
10.17.3.4 Configuration of the COS changeover (BERUM) ... 1092
10.17.3.5 Configure the Authorization for "COS Changeover with Code" ... 1093
10.17.3.6 Configure the station-specific COSXCD for BERUM ... 1093
10.17.3.7 Activate/deactivate COS changeover from the terminal ... 1093
10.17.4 Relevant AMOs ... 1094
10.18 Desktop Callback Idle Display Option ... 1095
10.18.1 Feature Description ... 1095
10.18.2 Service Information ... 1095
10.18.3 Generation (Example) ... 1096
10.18.4 Relevant AMOs ... 1096
10.19 Dictation Equipment DICT ... 1096
10.20 Digital Station with S0 Interface ... 1097
10.20.1 Functional Bus ... 1097
10.20.2 Bus Extenders ... 1098
10.20.2.1 Adding NV Services to the Functional Bus ... 1098
10.20.2.2 Adding MSN Call Numbers to the Functional Bus ... 1099
10.20.2.3 Deleting Devices at the S0 ... 1100
10.21 Direct Station Selection (DSS) ... 1101
10.21.1 Feature Description ... 1101
10.21.2 Service Information ... 1101
10.21.3 Generation (Example) ... 1101
10.21.4 Relevant AMOs ... 1102

10.22 Disable Flash on Analog Phones....1102
10.22.1 Overview....1103
10.22.2 Feature Description....1103
10.22.3 User Interface....1103
10.22.4 Service Information....1103
10.22.5 Generation (Example)....1104
10.22.6 Relevant AMOs....1104
10.23 Disable Message Waiting Lamps on OPS....1104
10.23.1 Overview....1104
10.23.2 Feature Description....1104
10.23.3 User Interface....1105
10.23.4 Service Information....1105
10.23.5 Generarion (Example)....1105
10.23.6 Relevant AMOs....1105
10.24 DNIS (Directory Number Identification Services)....1106
10.24.1 Overviews....1106
10.24.2 Feature Description....1106
10.24.2.1 Definition of Tables....1106
10.24.2.2 Definition of Terms....1107
10.24.2.3 AMO Relationships....1107
10.24.3 Service Information....1107
10.24.4 Generation....1107
10.24.4.1 AMO WABE....1107
10.24.4.2 AMO TDCSU (Digital), AMO TACSU (Analog) Trunk Configuration....1108
10.24.4.3 AMO BUEND....1108
10.24.4.4 GDTR Conversion for only Called Party Number....1108
10.24.4.5 GDTR Conversion for Called Part Number and SID/ANI info....1110
10.24.4.6 DNIT table GDTRSR....1112
10.24.4.7 GDTR Digit Conversion (DNIS) without SID/ANI signalling without PRI services....1113
10.24.4.8 GDTR Digit Conversion (DNIS) with SID/ANI signalling without PRI-Services for USA-PRI Trunks....1114
10.24.4.9 GDTR Digit Conversion (DNIS) with SID/ANI signalling with PRI Services for USA-PRI Trunks for ACD call....1115
10.24.4.10 GDTR Digit Conversion for Cornet-NQ PRI Trunks....1115
10.24.4.11 Without DNIS feature configuration....1115
10.24.4.12 DIDCR Digit Conversion without services for analog trunks....1116
10.24.4.13 DIDCR Digit Conversion with SID/ANI signalling with Trunking Services for USA-T1 Trunks....1116
10.24.4.14 DID call blocking DIDBLK....1117
10.24.4.15 Call Routing when no CLI present....1117
10.24.5 Relevant AMOs....1118
10.25 DSS 1 Terminals....1121
10.25.1 Feature Description....1122
10.25.2 User Interface....1124
10.25.2.1 Call Forwarding (CFU, CFB, CFNR, and CD)....1124
10.25.2.2 Call on Hold....1125
10.25.2.3 Call Transfer (ECT)....1125
10.25.2.4 Three-Party Conference....1125
10.25.2.5 Call Waiting (CW)....1126
10.25.2.6 Callback (CCBS) WP3....1126
10.25.2.7 Called Party Display Suppression (COLR)....1126
10.25.2.8 Advice of Charge....1127
10.25.2.9 Malicious Call Identification....1127
10.25.2.10 Terminal Portability....1128
10.25.3 Service Information....1128
10.25.4 Generation (Example)....1129

10.25.5 Relevant AMOs.... 1131
10.25.6 Glossary....1131
10.26 E911 Emergency Call....1131
10.26.1 Feature Description....1132
10.26.2 Central Office (CO) Requirements....1132
10.26.3 User Interface....1132
10.26.3.1 Subscriber.... 1133
10.26.3.2 Administrator.... 1133
10.26.4 Service Information.... 1133
10.26.5 AMO Usage....1134
10.26.5.1 Basic AMOs.... 1134
10.26.5.2 ISDN Connection to the C.O....1135
10.26.5.3 Analog Connection to the C.O.... 1136
10.26.5.4 Digital Networking OpenScape 4000....1137
10.26.5.5 Digital Networking V6.6.... 1138
10.26.5.6 Analog Networking....1138
10.26.5.7 Relevant AMOs....1139
10.26.6 Notifications for emergency calls.... 1140
10.26.7 E-mail notification of system errors.... 1141
10.26.7.1 SMTP Server Configuration....1142
10.26.7.2 Trap Filter....1143
10.27 Emergency Call.... 1144
10.27.1 Feature Description....1144
10.27.2 Service Information.... 1144
10.27.3 Generation (Example).... 1144
10.27.4 Relevant AMOs.... 1145
10.28 Emergency Override/Disconnect....1146
10.28.1 Feature Description....1146
10.28.2 Service Information.... 1146
10.28.3 Generation (Example).... 1146
10.28.4 Relevant AMOs.... 1148
10.29 Entrance Telephone with Door Opener....1150
10.30 EURO ISDN Terminals....1150
10.30.1 Configuration.... 1150
10.30.1.1 Configuration Examples....1151
10.30.1.2 Option Table....1151
10.30.1.3 Station class of service....1154
10.30.2 Additional Services....1155
10.30.2.1 Multiple Subscriber Numbers (MSN) on the S0 Bus....1155
10.30.2.2 Deleting of an Configuration....1159
10.30.3 Subaddressing (SUB)>....1160
10.30.3.1 Malicious Call Identification.... 1161
10.30.3.2 User-to-User Signalling (UUS)....1161
10.30.3.3 Terminal Portability....1161
10.30.3.4 Call Waiting....1161
10.30.3.5 Call Completion Busy Subscriber....1162
10.30.3.6 COLR.... 1162
10.30.3.7 Advice of Charge....1162
10.31 Executive Features....1162
10.31.1 Features....1162
10.31.1.1 DSS lines.... 1162
10.31.1.2 Mailboxes per line....1162
10.31.1.3 Entry without tone....1163
10.31.1.4 Ring transfer.... 1163
10.31.1.5 Redial destinations for trunks used.... 1163
10.31.2 Example: Configuration over two Nodes.... 1163

10.31.3 Relevant AMOs..... 1169
10.32 Flexible optiPoint Display..... 1170
10.32.1 Feature Description..... 1170
10.32.2 Service Information..... 1170
10.32.3 User Interface/Display Formats..... 1171
10.32.4 Relevant AMOs..... 1172
10.33 Hotline/Off-Hook Recall..... 1173
10.33.1 Relevante AMOs..... 1174
10.34 Ignore Call Forwarding..... 1175
10.34.1 Feature Description..... 1175
10.34.2 Service Information..... 1175
10.34.3 Generation (Example)..... 1175
10.34.4 Relevant AMOs..... 1176
10.35 Malicious Call Identification/Tracing..... 1176
10.35.1 Feature Description..... 1176
10.35.2 Service Information..... 1176
10.35.3 User Interface..... 1176
10.35.4 Generation (Example)..... 1177
10.35.5 Relevant AMOs..... 1178
10.36 Manual Hold of Consultation..... 1179
10.36.1 Overview..... 1179
10.36.2 User Interface..... 1180
10.36.3 Service Information..... 1180
10.37 Multilingual User Interface..... 1180
10.37.1 Feature Description..... 1180
10.37.2 Service Information..... 1181
10.37.3 Generation (Example)..... 1182
10.37.4 Relevant AMOs..... 1183
10.38 Name and Organization to a Number (ORG Assigning)..... 1183
10.39 Number Identification..... 1184
10.40 On Hook Transfer per User or a Group of Users..... 1184
10.40.1 Feature Description..... 1185
10.40.2 Service Information..... 1185
10.40.3 Generation (Example)..... 1185
10.40.4 Relevant AMOs..... 1185
10.41 OpenStage TDM..... 1186
10.41.1 Boards..... 1186
10.41.2 OpenStage terminal types..... 1186
10.41.3 Transmission Range..... 1186
10.41.4 Accessories..... 1189
10.41.5 Configuration..... 1190
10.41.5.1 Terminal Configuration..... 1190
10.41.5.2 Key assignment..... 1191
10.41.5.3 Master/Slave Configuration Downstream from Up0 Extender (Phone Adapter)..... 1191
10.41.5.4 OpenStage Busy Lamp Field..... 1194
10.41.5.5 Relevant AMOs..... 1195
10.41.6 TDM Software Download..... 1195
10.41.6.1 Feature description..... 1195
10.41.6.2 Restriction..... 1196
10.41.6.3 Configuration..... 1196
10.42 PIN (Personal Identification Number)..... 1197
10.42.1 PIN Types..... 1198
10.42.2 Functions / Restrictions when using a PIN..... 1200
10.42.3 PIN / PCODE Activation..... 1200
10.42.4 Length of PIN..... 1201
10.42.5 Manual PIN Types (PIN1 to PIN4 and PIN10-15)..... 1201

10.42.6 PIN Card (Chip Card)..... 1202
10.42.7 Class of Service Changeover Code (COSXCD)..... 1202
10.42.8 Class of Service Changeover to COS2 without COSXCD..... 1203
10.42.9 PIN Display on DIGITE Display..... 1203
10.42.10 Project Code..... 1203
10.42.11 Service Identifier..... 1203
10.42.12 Account Code..... 1204
10.42.13 Forced Authorization Code..... 1204
10.42.14 PIN Attributes..... 1204
10.42.14.1 PIN Type..... 1204
10.42.14.2 Duration of PIN Activation..... 1205
10.42.14.3 User Identification Display on Digite..... 1206
10.42.14.4 PIN-Identification at Home Station Only..... 1206
10.42.14.5 Transferring classes of service..... 1206
10.42.14.6 COS and Key Function Transfer from Home Station (internal PIN only)..... 1206
10.42.14.7 PIN-Entry in Repertory Keys and Speed Dialing List (internal PIN only)..... 1207
10.42.14.8 Automatic Exchange Seizure..... 1207
10.42.14.9 Additional Text for Call Data Recording (internal PIN only)..... 1207
10.42.14.10 Verifying the PIN/PCODE..... 1208
10.42.14.11 Station Number of Home/Foreign Station for CDR..... 1211
10.42.14.12 PIN/PCODE and Call Transfer (Extension)..... 1211
10.42.14.13 Detecting PIN/PCODE Hackers..... 1212
10.42.14.14 Deactivation of PIN by pressing Release or Delete Key..... 1212
10.42.14.15 PIN Valid for Digit Pattern Test..... 1212
10.42.15 Company Code\..... 1212
10.42.16 SMART Transfer Facility between Mailbox and Remote Station..... 1213
10.42.17 PIN/PCODE for Voice and Non-Voice..... 1213
10.42.18 PIN/PCODE in the Network..... 1213
10.42.18.1 Network-Wide PIN Usage..... 1213
10.42.18.2 PIN and Follow-Me in 1 Step..... 1215
10.42.19 Restart Security of PIN/PCODE..... 1215
10.43 PNT E for Connecting Standardized S0 Telephones..... 1215
10.43.1 Feature Description..... 1215
10.43.2 PNT E for Connecting Functional Station Devices..... 1216
10.43.3 PNT E for Connecting Functional NV Station Devices..... 1217
10.43.4 PNT E for Connecting Video Conference Equipment With Two Calling Numbers..... 1218
10.43.5 PNT E With Channel Bundling for NV Station Device..... 1219
10.44 Public Address System..... 1219
10.44.1 Feature Description..... 1219
10.44.2 User interface..... 1220
10.44.2.1 SLMA Access..... 1220
10.44.2.2 TMOM Access..... 1220
10.44.2.3 TIE or CO trunk Access..... 1221
10.44.3 Service information..... 1221
10.44.4 Generation (Example)..... 1221
10.44.4.1 SLMA Access..... 1221
10.44.4.2 TMOM Access..... 1221
10.44.4.3 TIE or CO Trunk Access..... 1222
10.44.5 Relevant AMOs..... 1222
10.45 Redial..... 1222
10.45.1 Saved Number Recall..... 1222
10.45.1.1 Generation..... 1222
10.45.2 Last Number Redialing..... 1223
10.45.2.1 Generation..... 1223
10.46 Repeat ID Key..... 1223
10.46.1 Feature Description..... 1223

10.46.2 User Interface....1224
10.46.3 Service Information....1224
10.46.4 Generation (Example)....1224
10.46.5 Relevant AMOs....1224
10.47 S2 Station Configuration....1225
10.47.1 Feature Description....1225
10.47.2 Service Information....1225
10.47.3 Generation (Example)....1225
10.47.4 Relevant AMOs....1226
10.48 Smart Card Application....1226
10.48.1 Feature Description....1227
10.48.2 User Interface....1227
10.48.3 Service Information....1228
10.48.4 Generation (Example)....1228
10.48.5 Relevant AMOs....1229
10.49 Speaker Call - One-Way....1229
10.49.1 Overview....1229
10.49.2 Feature Description....1230
10.49.3 User Interface....1230
10.49.4 Service Information....1231
10.49.5 Generation (Example)....1231
10.49.6 Relevant AMOs....1231
10.50 Special Ring Tone depending on Caller....1231
10.51 Speed Dialling....1232
10.51.1 Speed dialing, individual....1232
10.51.1.1 Overview....1232
10.51.1.2 Generation....1232
10.51.2 Speed Dialing, Central (SPDC)....1232
10.51.3 Extended functions for central speed dialing....1233
10.51.3.1 4-digit speed dialing facility....1233
10.51.3.2 5-digit speed dialing facility....1234
10.51.4 Relevant AMOs....1237
10.52 Stations....1237
10.52.1 Adding a Station (Example)....1239
10.52.2 Displaying Station Class of Services....1240
10.52.3 Displaying a Station from a Specific Class of Service....1240
10.52.4 Displaying Station Features....1240
10.52.5 Changing a Station's COS....1241
10.52.6 Station Number Changes....1241
10.52.6.1 Feature Description....1241
10.52.6.2 Service Information....1241
10.52.6.3 Generation (Example)....1241
10.52.7 Swapping Station Numbers....1242
10.52.7.1 Feature Description....1242
10.52.7.2 Service Information....1242
10.52.7.3 Generation (Example)....1242
10.52.8 Changing the Station Port Assignment....1242
10.52.8.1 Feature Description....1243
10.52.8.2 Service Information....1243
10.52.8.3 Generation (Example)....1243
10.52.9 Exchanging Terminals....1243
10.52.9.1 Feature Description....1243
10.52.9.2 Service Information....1244
10.52.9.3 Generation (Example)....1244
10.52.10 Station Port Deletion....1246
10.53 Station Controlled Conference....1246

10.53.1 Feature Description....1247
10.53.1.1 Hold a Conference....1248
10.53.1.2 Pick a Call and add to Conference, or Create a Conference....1248
10.53.1.3 Station Controlled Conference in the Private Network....1248
10.53.1.4 Prevention of consultation, transfering and hold by networked conference party....1249
10.53.1.5 Starting a Conference using Keyset Lines....1250
10.53.2 User Interface....1250
10.53.2.1 Create and add....1251
10.53.2.2 Hold of a Conference....1252
10.53.2.3 Pick a Call and Create a Conference....1252
10.53.2.4 Pick a Call and add to the Conference....1252
10.53.2.5 Removal of a Conference Member....1253
10.53.2.6 Optiguide....1253
10.53.2.7 Station Controlled Conference in the Private Network....1253
10.53.3 Service Information....1254
10.53.4 Generation....1255
10.53.5 Relevant AMOs....1256
10.54 Station Relocation....1258
10.54.1 Feature Description....1258
10.54.2 Service Information....1258
10.54.3 Generation (Example)....1258
10.54.4 Relevant AMOs....1259
10.55 Step by Step Dialing....1259
10.55.1 Description....1259
10.55.2 Supported Hardware, Lines, Protocols....1260
10.55.3 Restrictions....1260
10.55.4 Basic Configuration Notes....1260
10.55.4.1 No Answer....1261
10.55.4.2 Routing....1261
10.55.4.3 Outdial Rule....1261
10.55.4.4 COT/COP....1261
10.55.4.5 Timer....1261
10.55.5 Configuration Examples....1262
10.55.5.1 ECMA Protocol with Announcement....1262
10.55.5.2 Dial Pulsing Circuits (DIUC64) with ANSWER from the Trunk....1263
10.55.5.3 DTMF Circuits (DIUC64) with ANSWER from the Trunk....1264
10.55.5.4 Dial Pulsing Circuits (TMEMW) with ANSWER from the Trunk....1264
10.55.5.5 Dial Pulsing Circuits (DIUC64) without ANSWER from the Trunk....1266
10.55.5.6 DTMF Circuits (DIUC64) without ANSWER from the Trunk....1266
10.55.5.7 Dial Pulsing Circuits (TMEMW) without ANSWER from the Trunk....1267
10.55.5.8 DTMF Circuits (TMEMW) without ANSWER from the Trunk....1268
10.55.5.9 Configuration Data for Step by Step Dialing via ECMAV2 (Analog Dial Pulsing Circuit)....1269
10.55.5.10 Configuration Data for Step by Step Dialing via ECMAV2 (DTMF analog)....1269
10.56 Suffix Dialing....1269
10.56.1 Feature Description....1269
10.56.2 Flashing Signal at AC....1271
10.56.3 Busy Override....1271
10.56.4 TFZ Signaling....1271
10.56.5 EB5/NAL signaling....1273
10.57 Suppression of the FWD Destination at the Caller's Display....1274
10.57.1 Feature Description....1274
10.57.2 Service Information....1275
10.57.3 Generation (Example)....1275
10.57.4 Relevant AMOs....1275
10.58 Transfer before Answer ex Call State....1276
10.58.1 Feature Description....1276

10.58.2 Service Information..... 1277
10.58.3 Effects on other features.....1278
10.58.4 Service Information..... 1279
10.58.5 Generation.....1279
10.58.6 Relevant AMOs..... 1280
10.59 User Signaling for the U.S. Market.....1281
10.59.1 Feature Description.....1281
10.59.2 User Interface.....1281
10.59.3 Service Information..... 1281
10.59.4 Generation (Example)..... 1282
10.59.4.1 LED Handling.....1282
10.59.4.2 Ring Cadences..... 1283
10.59.4.3 Tones on Display Phones:.....1284
10.59.5 Relevant AMOs..... 1285
10.60 User-to-User Service..... 1287
10.60.1 Feature Description..... 1287
10.60.2 Service Information..... 1288
10.60.3 Generation (Example)..... 1289
10.60.3.1 AMO batch for DSS1 terminals..... 1289
10.60.3.2 AMO batch for CMI and network-wide CHESE.....1290
10.60.3.3 AMO batch for networks.....1290
10.60.4 Relevant AMOs..... 1292
10.61 Variable Call Forwarding No Reply.....1293
10.61.1 Feature Description.....1293
10.61.2 Service Information..... 1293
10.61.3 Generation (Example)..... 1293
10.61.4 Relevant AMOs..... 1294
10.62 Witness Facility.....1294
10.62.1 Feature Description.....1294
10.62.2 Service Information..... 1295
10.62.3 Generation (Example)..... 1295
10.62.4 Relevant AMOs..... 1296
10.63 Announcement for internal caller if the call is forwarded outside of company’s own telephony network.....1298
10.63.1 Feature Description.....1298
10.63.2 Generation (Example)..... 1299
10.63.3 Service information.....1301

11 Attendant Console.....1302
11.1 Attendant Console..... 1302
11.1.1 Overview.....1302
11.1.2 Feature Description..... 1302
11.1.3 Comfort Attendant Console.....1304
11.1.3.1 Overview AC-WIN (DQ).....1304
11.1.3.2 Overview AC-Win MQ.....1304
11.1.4 Nodes without an Attendant Console.....1305
11.1.4.1 Feature Description.....1305
11.1.4.2 Service Information..... 1306
11.1.4.3 Generation (Example)..... 1306
11.1.4.4 Relevant AMOs..... 1306
11.1.5 Usage - Examples.....1307
11.1.5.1 Assign an Attendant (AC)..... 1307
11.1.5.2 Assign an Attendant Group (ATNDGR)..... 1307
11.1.5.3 Assign a Name to an ATND Group..... 1308
11.1.5.4 Remove an ATND from an ATNDGR and Delete.....1308
11.1.5.5 Change personal number of attendant..... 1309

11.1.5.6 Change ATND Internal Access and Answer Codes ... 1309
11.1.5.7 Add an ATND to an ATNDGR ... 1309
11.1.5.8 Internal Centralized Attendant Services ... 1309
11.1.5.9 External Centralized Attendant Services Group ... 1310
11.1.6 Function-Enhancements for the Attendant Queues ... 1311
11.1.6.1 Priority Calculation and Queue Assignment ... 1312
11.1.6.2 Priority Upgrade ... 1320
11.1.7 Automatic Night Service ... 1321
11.1.7.1 Feature Description ... 1322
11.1.7.2 Service Information ... 1322
11.1.7.3 Generation (Example) ... 1322
11.1.7.4 Relevant AMOs ... 1323
11.1.8 Attendant Intercept ... 1323
11.1.8.1 Feature Description ... 1323
11.1.8.2 Service Information ... 1323
11.1.8.3 Generation (Example) ... 1324
11.1.8.4 Relevant AMOs ... 1325
11.1.9 Extend Call to Paged User ... 1326
11.1.9.1 Overview ... 1326
11.1.9.2 Feature Description ... 1327
11.1.9.3 User Interface ... 1327
11.1.9.4 Service Information ... 1329
11.1.10 Remote Activation of Call Forwarding for Users at the Attendant Console ... 1329
11.1.10.1 Overview ... 1329
11.1.10.2 Service Information ... 1330
11.1.10.3 Generation (Example) ... 1330
11.1.10.4 Relevant AMOs ... 1330
11.1.11 Attendant Control of Diversion ... 1330
11.1.11.1 Overview ... 1331
11.1.11.2 Feature Description ... 1331
11.1.11.3 Service Information ... 1331
11.1.11.4 Generation (Example) ... 1332
11.1.11.5 Relevant AMOs ... 1332
11.1.12 Displaying of the Source Dialling Number instead of Number of the Attendant Console ... 1332
11.1.12.1 Feature Description ... 1333
11.1.12.2 Generation ... 1333
11.1.12.3 Relevant AMOs ... 1333
11.2 Attendant Light ... 1333
11.2.1 Service Information ... 1333
11.2.1.1 General Information ... 1333
11.2.1.2 Interworking with other features ... 1335
11.2.1.3 Restrictions ... 1335
11.2.2 Generation (Example) ... 1335
11.2.2.1 Master Hunt Group ... 1335
11.2.2.2 Code Hunt Group ... 1336
11.2.2.3 Configure key layout for busy lamp field ... 1337
11.2.3 Relevant AMOs ... 1338
11.3 Call Retrieval ... 1339
11.3.1 Feature Description ... 1339
11.3.2 Service Information ... 1340
11.3.3 Generation (Example) ... 1340
11.3.4 Relevant AMOs ... 1340
11.4 Code Calling System Basic ... 1341
11.4.1 CC in DISPLAY OPERATION ... 1342
11.4.2 CC in VOICE ANNOUNCEMENT Operation ... 1342
11.4.3 CC in MEET-ME Operation ... 1343

11.4.4 Code Calling in MIXED MODE Operation with CODE DIGIT....1343
11.4.5 Code Calling in TRANSPARENT MODE Operation....1344
11.5 General Night Switching Options....1344
11.5.1 Feature Description....1344
11.5.2 Service Information....1345
11.5.3 Generation (Example)....1345
11.5.4 Expand a Night Option....1346
11.5.5 Reduce a Night Option....1347
11.5.6 Delete a Night Option....1347
11.5.7 Relevant AMOs....1347
11.6 Multiple Code Calling System CCM....1348
11.6.1 CCM in Display Operation....1349
11.6.2 CCM in Meet-me Operation....1351
11.6.3 CCM in Meet-me Operation with Display....1351
11.6.4 Reversing the Number Display Sequence....1352
11.6.5 Left-Justified/Right-Justified A-Number Display....1352
11.6.6 CCM with Block Separators and End-of-Block Characters....1352
11.6.7 CCM with Code Conversion....1353
11.6.8 Parallel Ringing of Exchange Calls if FWD/FNANS Activated to CCM in Meet-me Operation....1354
11.6.9 Priority Signalling of Urgent Exchange Calls for CCM in Meet-me Operation....1354
11.6.10 Announcements for CCM in Meet-Me Operation....1354
11.6.11 Display Number Modification with AMO KNMAT....1356
11.6.12 Multiple code calling of the same paging number....1357
11.6.13 Suffix dialing to CCM with busy....1358
11.6.14 Paging with on-hook handset internally and throughout network....1358
11.6.15 CTIME Timers for CCM....1358
11.7 Remote Night Station Changeover....1359
11.7.1 Feature Description....1359
11.7.2 Service Information....1359
11.7.3 Generation (Example)....1360
11.7.4 Relevant AMOs....1360
11.8 Trunk Night Service....1360
11.8.1 Feature Description....1361
11.8.1.1 Console night service....1361
11.8.1.2 Group night service....1362
11.8.1.3 Trunk night service....1362
11.8.2 Restrictions....1363
11.8.3 AMO Usage Examples....1363
11.8.4 Generation (Examples)....1364
11.8.4.1 Trunk Night Service....1364
11.8.4.2 Centralized Attendant Configuration....1365
11.8.5 Relevant AMOs....1367
11.9 Universal Night Answer....1369
11.9.1 Feature Description....1369
11.9.2 Service Information....1370
11.9.3 Generation (Example)....1370
11.9.4 Relevant AMOs....1371

12 ACD....1373
12.1 ACD (Automatic Call Distribution)....1373
12.1.1 Enhanced Agent Feature Operation after Soft Restart....1373
12.1.1.1 Feature Description....1374
12.1.1.2 User Interface....1374
12.1.1.3 Service Information....1374
12.1.2 Phantom Lines as Agents....1374
12.1.2.1 Feature Description....1374

12.1.2.2 User Interface..... 1375
12.1.2.3 AMO Usage..... 1376
12.1.2.4 Relevant AMOs..... 1377
12.1.3 PhoneMail Ports as Agents..... 1377
12.1.3.1 Feature Description..... 1377
12.1.3.2 User Interface..... 1378
12.1.3.3 AMO Usage..... 1378
12.1.3.4 Relevant AMOs..... 1380
12.1.4 Special Outpulsing Devices (SODs) as Agents..... 1380
12.1.4.1 Feature Description..... 1380
12.1.4.2 User Interface..... 1381
12.1.4.3 AMO Usage..... 1381
12.1.4.4 Relevant AMOs..... 1382
12.1.5 Silent/Tone Monitoring of Non-Agent Targets..... 1382
12.1.5.1 Feature Description..... 1382
12.1.5.2 User Interface..... 1383
12.1.5.3 Relevant AMOs..... 1383
12.1.6 Consultation Calls from Conference into ACD..... 1383
12.1.6.1 Feature Description..... 1383
12.1.6.2 User Interface..... 1383
12.1.7 Honoring of Call Forwarding for ACD Routes Offsite..... 1383
12.1.7.1 Feature Description..... 1383
12.1.8 Automatic Call Acceptance (ACD Zip Tone)..... 1384
12.1.8.1 Feature Description..... 1384
12.1.8.2 Relevant AMOs..... 1384
12.1.9 Personal Call Notification (AICS for ACD calls only)..... 1384
12.1.9.1 Feature Description..... 1384
12.1.9.2 Service Information..... 1385
12.1.9.3 Relevant AMOs..... 1385
12.1.10 Display the A Number at the Agent..... 1385
12.1.10.1 Feature Description..... 1386
12.1.10.2 Scenarios..... 1386
12.1.10.3 Activation..... 1387
12.1.11 Ringback Tone for Diverted Call to analog CallDirector..... 1387
12.1.11.1 Feature Description..... 1387
12.1.11.2 Service Information..... 1387
12.1.11.3 Generation (Example)..... 1388
12.1.11.4 Relevant AMOs..... 1388
12.1.12 Divert Call Request Support of Reroute Internal..... 1389
12.1.12.1 Divert Call Requests if the Destination is a Trunk with Reroute Internal..... 1389
12.1.12.2 ACL Set Forward Command Support for Reroute Internal..... 1390
12.1.13 Application Populated Caller ID (APCID)..... 1392
12.1.13.1 Feature Description..... 1392
12.1.13.2 Service Information..... 1393
12.1.13.3 Generation (Example)..... 1394
12.1.14 Displaying the ACD Pilot Number and Name for Outgoing System-Internal Calls..... 1394
12.1.14.1 Feature Description..... 1394
12.1.14.2 Service Information..... 1395
12.1.14.3 Generation (Example)..... 1396
12.1.14.4 Relevant AMOs..... 1396
12.1.15 DNIT Number Presentation..... 1397
12.1.15.1 Feature Description..... 1397
12.1.15.2 Service Information..... 1397
12.1.15.3 Generation (Example)..... 1398
12.1.16 Virtual Agents..... 1398
12.1.16.1 Feature description..... 1398

12.1.16.2 Static OND.....1399
12.1.16.3 Virtual Agent Station.....1399
12.1.16.4 Agent features for Virtual Agent Station.....1400
12.1.16.5 Restrictions.....1400
12.2 Flexrouting.....1401
12.2.1 Feature Description.....1401
12.2.1.1 The fundamental routing functions of the ACD package are:.....1401
12.2.1.2 Server Functions.....1401
12.2.1.3 The following is a short description of the features.....1402
12.2.2 User Interface.....1403
12.2.3 Service Information.....1403
12.2.4 Generation (Example).....1405
12.2.4.1 Defining ACD call numbers, groups and users.....1405
12.2.4.2 Defining routes.....1410
12.2.5 Relevant AMOs.....1415
12.3 Flexrouting Silent/Tone Monitoring PIN.....1425
12.3.1 Overview.....1425
12.3.2 Feature Description.....1426
12.3.3 User Interface.....1426
12.3.3.1 Feature Activation with Positive Acknowledgement.....1426
12.3.3.2 Feature Activation with Negative Acknowledgement.....1427
12.3.3.3 Feature Deactivation.....1427
12.3.4 Service Information.....1427
12.3.5 Feature Interactions.....1428
12.3.6 Generation (Example).....1429
12.3.7 Relevant AMOs.....1430
12.4 Whisper Announcement.....1431
12.4.1 Feature Description.....1431
12.4.2 Realization.....1431
12.4.3 User Interface.....1432
12.4.3.1 ACD WHISPER ANNOUNCEMENT Feature Activation.....1432
12.4.3.2 Breakdown of Whisper monitor Connection - Monitoring Party.....1434
12.4.3.3 Breakdown of Whisper Monitor Connection - Monitored Party / Non-Monitored Party.....1434
12.4.3.4 Breakdown of Whisper monitor Connection - Monitor Party Wait State.....1434
12.4.3.5 Reestablishing the Whisper Monitor Connection.....1434
12.4.3.6 Whisper Announcement Feature and Whisper Monitor Connections over a CC Soft Restart... 1435
12.4.4 Administration.....1435
12.4.5 Restrictions.....1436

13 Applications.....1437
13.1 Announcement Unit.....1437
13.1.1 Assignment of Announcement Unit for General Text (internal).....1437
13.1.2 Announcement Unit for Greeting Text and General Text.....1437
13.2 Music Source External.....1439
13.2.1 Feature Description.....1439
13.2.2 Generation (Example).....1439
13.2.3 Service Information.....1439
13.2.4 Relevant AMOs.....1439
13.3 Synchronized Announcements.....1440
13.3.1 General.....1440
13.3.2 Connecting Announcement Units.....1445
13.3.2.1 Prerequisites, Interrelationships.....1449
13.3.3 Help for Setting Synchronized Announcements.....1458
13.3.4 Possible Reasons why Announcements may not Work.....1464
13.3.4.1 General Requirements:.....1465
13.3.4.2 Announcements for Attendant Call Queue.....1466

13.3.4.3 Announcements for Calls to Multiple CCM..... 1467
13.3.4.4 Announcements for Hunting Group Call Queue.....1468
13.3.4.5 General Announcements if Called Station is Busy.....1468
13.3.4.6 Announcement for Automatic Camp-on on Busy Station.....1469
13.3.4.7 General Announcements with call to station and no answer..... 1470
13.3.4.8 Announcements for Suffix Dialing if Called Station is Busy..... 1471
13.3.4.9 Announcements for Suffix Dialing if Station User does not Answer.....1471
13.3.4.10 Announcements for Direct Inward Dialing..... 1472
13.3.4.11 Announcement for call to AC in night service..... 1472

14 MLPP (Multi-Level Precedence and Preemption).....1474
14.1 Feature Description..... 1474
14.2 Specific terminology.....1474
14.3 Overview..... 1475
14.4 Administration..... 1475
14.4.1 Relevant AMOs..... 1476
14.4.2 Global switch configuration..... 1486
14.4.2.1 Global configuration for trunk searching (SMEO).....1487
14.4.2.2 Global configuration for DSN Hotline (SMEO)..... 1489
14.4.3 Announcements (via Musiphone).....1490
14.4.4 Assignment of the Information Tones..... 1493
14.4.5 Assignment of Ringing Tones..... 1493
14.4.6 Basic Trunk Administration..... 1494
14.4.6.1 General Administration of T1 MOS (example)..... 1494
14.4.6.2 General Administration of T1 BOS (example).....1497
14.4.6.3 General administration for E1 CAS (example).....1498
14.4.6.4 Outpulsing Format..... 1500
14.4.6.5 Trunk Supervisory Preemption with E&M Wink.....1500
14.4.6.6 Emergency Service.....1500
14.4.6.7 NI2 Precedence Level IE.....1501
14.4.6.8 DISC MSG Information Cause Values..... 1502
14.4.6.9 Signal Information Element.....1504
14.4.7 Calls in Queue to the Attendant..... 1504
14.4.7.1 Assignment of the MLPP call queues with AMO-VFGR.....1504
14.4.7.2 Assignment of the MLPP call queues on AC-Win-MQ Application.....1505
14.4.8 CDR Fields (SMEO).....1506
14.4.9 DSN Hotline Service (SMEO).....1508
14.4.9.1 Protected Hotline Calling..... 1508
14.4.9.2 Pair Protected Hotline Calling.....1509
14.4.9.3 Unprotected Hotline Receiving..... 1509
14.4.9.4 Protected Hotline Receiving..... 1510
14.4.10 Outgoing and tandem call trace (SMEO).....1510
14.4.10.1 Creating a new list.....1510
14.4.10.2 Displaying the list of destination numbers that will be traced.....1511
14.4.10.3 Adding a new destination number to the list..... 1511
14.4.10.4 Deleting a number from the list..... 1511
14.4.10.5 Deleting the list of destination numbers to be traced.....1511
14.4.11 Further Information..... 1511
14.4.11.1 Change host to aLaw.....1512
14.4.11.2 Change host to uLaw.....1512
14.4.11.3 Law conversion on AP3700IP.....1512
14.4.11.4 Number Routing on US Military Bases.....1513
14.4.11.5 Setting the Precedence-Digit representation and the Route Digit on CAS Outpulsing..... 1518
14.5 User interface..... 1518
14.5.1 Originating User..... 1518
14.5.2 Destination User.....1519

14.5.2.1 Called MLPP subscriber is idle..... 1519
14.5.2.2 Called MLPP subscriber is busy (with camp on).....1520
14.5.2.3 Called MLPP subscriber busy (without camp on)..... 1520
14.5.3 Invocation and operation.....1520
14.5.4 Announcements.....1521
14.5.5 Precedence Call Diversion.....1521
14.5.6 Precedence Call Waiting.....1522
14.5.7 Call Forwarding..... 1522
14.5.8 Three Way Calling.....1522
14.5.9 Defense Switched Network World Wide Numbering and Dialing Plan..... 1523
14.5.10 Calls in Queue to the Attendant..... 1523
14.5.11 Call Waiting for Anate..... 1523
14.5.11.1 Feature Description.....1523
14.5.11.2 Service Information..... 1523
14.5.11.3 Generation (Example)..... 1523
14.5.11.4 Relevant AMOs..... 1524
14.6 Generic Switching Center Requirements (GSCR)..... 1524
14.6.1 Interswitch and Intraswitch Dialing.....1524
14.6.2 Seven-Digit Dialing.....1524
14.6.3 Ten-Digit Dialing..... 1525
14.6.4 Emergency Service 911 Conflict Resolution.....1526

15 COP and COT Parameter.....1527
15.1 Default values for COP and COT..... 1527
15.1.1 Default parameters for COP..... 1527
15.1.2 Default parameters for COT..... 1530
15.1.3 Variant table and value in the database for COP.....1536
15.1.4 Variant table and value in the database for COT.....1539
15.2 Parameter Generation and Signaling for International Markets.....1541
15.2.1 Exchange Traffic and Tie Traffic for UK.....1542
15.2.2 Parameter Overview for UK.....1542
15.2.3 Exchange Traffic and Tie Traffic for France..... 1543
15.2.4 Parameter Overview for France.....1544

16 COP Parameter..... 1545
16.1 Organization of COP parameters.....1545
16.1.1 COP parameter description.....1546
16.1.2 COP parameter usage for different signaling methods..... 1559
16.1.2.1 Overview of COP for Alternating Current.....1560
16.1.2.2 Overview of COP for loop signaling..... 1561
16.1.2.3 Overview of COP for Tone Frequency Signaling.....1563
16.1.2.4 Overview of COP for E & M Signaling..... 1564
16.1.2.5 Overview of COP for MOSIG/DP Signaling.....1568
16.1.3 Configurations for foreign countries.....1569
16.2 ALUL - A- to Mu- Law Convertor.....1569
16.3 COTT - CO-Tone in Transit Traffic.....1570
16.4 NAAT - North America Analog Trunks..... 1571

17 COT Parameter..... 1572
17.1 Organization of COT parameters.....1572
17.1.1 COT Parameter Description.....1574
17.1.2 Examples of COT Parameter Initializations.....1595
17.1.2.1 Digital exchange traffic via S0/S2 interface.....1595
17.1.2.2 Digital main/satellite PBX traffic via S0/S2 interface (OpenScape 4000/OpenScape 4000)..... 1596
17.1.2.3 Digital tie-line traffic via S0/S2 interface.....1599
17.1.2.4 Digital Inter-PBX traffic via S0/S2 Interface (OpenScape 4000/OpenScape 4000= Local Internal Network)..... 1601

17.1.2.5 Main / Satellite PBX traffic with loop signalling or WTK signalling..... 1603
17.1.2.6 Digital exchange (CO) traffic with speed dialling.....1606
17.1.2.7 Networking..... 1607
17.1.3 Configurations for foreign countries.....1608
17.2 ADIU - Attenuation of DIUC trunk circuits (CIS).....1608
17.3 AICF - ATND intercept if the call is identified as forwarded..... 1609
17.4 ANNC - Activate local announcement to calling system for incoming seizure of analog trunk.....1609
17.5 ANS - Trunk signaling answer..... 1610
17.6 ATRS - Activate network loop check with transit counter..... 1611
17.7 BCNE - B-channel negotiation for EDSS1.....1612
17.8 BLOC - Signal "end-of-dial" to partner nodes.....1613
17.9 BRAR - Backward Release (of an incoming CO call).....1614
17.10 CDN - Call Deflection network-wide.....1614
17.11 CFBN - Call Forward Busy network-wide..... 1615
17.12 CFOS - Call forwarding programming for other subscribers.....1615
17.13 CFTR - Activate, deactivate and check routes for call forwarding in central office..... 1616
17.14 CFVA - Enable connectivity validation for call forwarding destinations in network.....1617
17.15 CTLN - Prevent controlled line and trunk selection in an external system..... 1619
17.16 CTLS - Controlled trunk and line selection network-wide.....1619
17.17 CUG - Release Closed User Groups network-wide.....1620
17.18 DISN - Only display the dialed number on A station display.....1621
17.19 DSIT - Disconnect Supervision for Incoming Trunk.....1621
17.20 DTNE - Provide external dial tone to calling system for incoming seizure..... 1622
17.21 ETSC - UUS ETSI conform..... 1623
17.22 FAX1 - Call forwarding from incoming FAX CO lines to Phonemail..... 1624
17.23 FAX2 - Call forwarding from incoming FAX CO lines to Phonemail..... 1625
17.24 FNAN - Enable rerouting for network-wide forwarding on no answer to source node..... 1626
17.25 FWDN - Release rerouting for network-wide call forwarding to source node..... 1628
17.26 ITRN - Internal traffic restriction group (ITR) network-wide..... 1629
17.27 KNDI - Camp-on in DID calls (TC and TT).....1630
17.28 KNOR - Knocking override possible..... 1631
17.29 LINC - Handling implicit numbers when connecting to a carrier.....1632
17.30 LINO - Line with implicit number.....1634
17.31 LPRN - Permanent station number suppression for EDSS1 CO.....1634
17.32 LRPM - Line to Phonemail.....1635
17.33 MFCL - Line with MFC (Multi-Frequency Code) signaling.....1636
17.34 MICC - MCID call clearing control required.....1636
17.35 MIIH - Make MCID here, print out MCID locally.....1637
17.36 MLPR - Multi-level precedence and preemption.....1638
17.37 NAAT - North America Analog Trunks..... 1638
17.38 NCT - Network Call Transfer.....1639
17.39 NCTP - Partner node cannot execute network-wide call forwarding after transfer..... 1639
17.40 NIN2 - No multi-level precedence and preemption on trunk.....1640
17.41 NITO - No intercept in networking transit lines.....1641
17.42 NLCR - Partner system sends no LCR authorizations in Voice or Fax service..... 1642
17.43 NLHT - No local hold tone, hold tone sent by remote system.....1643
17.44 NLRD - Partner system sends no LCR authorizations in the Data service.....1644
17.45 NMLT - No multi-level precedence and preemption on trunk..... 1644
17.46 NOFT - No Flag Trace..... 1645
17.47 NOHO - No Hold for NW Conference.....1646
17.48 NORR - No rerouting with LCR..... 1646
17.49 NOSD - No Simple Dialog Available.....1647
17.50 NOTO - No Tone for Unsuccessful Call.....1648
17.51 NOVC - No override on CO connections.....1649
17.52 NPIS - Numbering Plan ISDN on outgoing trunk calls..... 1650
17.53 NPPR - Numbering Plan PRIVATE on outgoing trunk calls.....1651

17.54 NPUN - Numbering Plan UNKNOWN on outgoing trunk calls....1652
17.55 NQNP - Neighboring node does not support CorNet-NQ network-wide call pickup....1652
17.56 NQPI - Neighboring node does not support CorNet-NQ network-wide call pickup information....1653
17.57 NTON - Do not connect dial tone or announcement for incoming seizure of analog circuits....1654
17.58 OHKQ - Off Hook Queuing for transit connections....1655
17.59 PINR - Signal PIN features network-wide....1655
17.60 PRI - Network-wide prioritized control of incoming calls at ATND....1656
17.61 RCL -Recall to attendant console or to transferring party if user hangs up in consultation call....1657
17.62 RCLS - Recalls to ATND suppressed in node without attendant console....1658
17.63 RLIN - Receive Trailing LIN digits....1658
17.64 SANH - Synchronized Announcement of Non OpenScape 4000 Switch....1659
17.65 SDID - Deactivate partial digit analysis in the device handler, activate single digit direct inward dialing....1659
17.66 SECO - Send Emergency Call Outgoing....1660
17.67 SIRI - Single ring burst....1661
17.68 SPAH - Park system and hold analog connection....1661
17.69 SPCM - Define a speech-compressed trunk group....1662
17.70 SPSR - Identify lines for a Phone Mail or Voice Mail server....1662
17.71 SUPN - Suppress name network-wide....1663
17.72 T4WA - Level switching on T reference point for device class TMA4WIRE....1664
17.73 TCC - Signal incoming calls on analog tie trunk circuits as trunk calls....1664
17.74 TCET - Through-connect a networking transit connection after call extend in call status....1665
17.75 TGRE - Control LCR rerouting on the basis of cause values....1666
17.76 TR6T -Tones are supplied as in a 1TR6 CO....1668
17.77 TNDV - Tone in end-of-dialing signals activates partner device of trunk....1669
17.78 TRBA - Transfer before answer to first connection....1670
17.79 TWDS - Transfer Allowed without Disconnect Supervision....1671
17.80 UUS1 - Implicit user-to-user signaling no. 1....1672
17.81 VCMN - Voice compression not allowed....1673

18 COT Parameter - Internal and network-wide call detail recording (INCDR)....1674
18.1 AOCC - Request charges per line for remote station....1674
18.2 CATR - Charge transfer via analog CO trunk circuits which are operated as tie trunk circuits in transit.. 1675
18.3 CCTN - Apply trunk number as A number....1675
18.4 CDBO - Set record point in network for call data recording....1676
18.5 CDFD - Call data recording for PNE lines....1677
18.6 DFNN - Use default node number for trunk as a dummy source node number....1677
18.7 DPRE - Send dial information actually sent to partner system as destination number with prefix digits to call data recording....1678
18.8 DSDL - Don't send diversion LEG information....1679
18.9 ICZL - Incoming call data recording by zone or from line....1679
18.10 ICZO - Incoming call data recording by zone only....1679
18.11 IICB - Ignore incoming billing information element....1680
18.12 LWNC - Line protocol without node number....1681
18.13 NCDR - No CDR-E-specific signaling messages to partner node....1681
18.14 NCHD - No charge data during call....1682
18.15 SNBE - Send no billing element to the partner system....1682
18.16 TRSC - Trunk sends call charges to source node....1683

Index....1685

1 General Information

1.1 Feature Usage Examples - Overview

This chapter contains feature usage examples for the basic system.

In this section the usage and parameters of the relevant AMOs for each application are shown. Please note that not all parameters are given, but often only the most important ones. If you require further information on other parameters, please refer to the AMO descriptions. The commands are shown as keyword-oriented commands (parameter acronym followed by equals sign followed by parameter value). Specific parameter values are only given in cases where they are necessary for the application concerned.

Beneath the table of content the content is sorted to the following 14 subjects:

Subject ACD

ACD (Automatic Call Distribution)

Flexrouting

Flexrouting Silent/Tone Monitoring PIN

Whisper Annoucement

Subject Applications

Announcement Unit

Music Source External

Synchronized Announcements

LRPM - Line to Phonemail

SPSR - Identify lines for a Phone Mail or Voice Mail server

Subject Attendant Console

Attendant Console

Attendant Light

Call Retrieval

Code Calling System Basic

General Night Switching Options

Ignore call forwarding

Multiple Code Calling System CCM

Remote Night Station Changeover

Trunk Night Service

Universal Night Answer

AICF - ATND intercept if the call is identified as forwarded

CFOS - Call forwarding programming for other subscribers

NIN2 - No multi-level precedence and preemption on trunk

NITO - No intercept in networking transit lines

PRI - Networkwide prioritized control of incoming calls at ATND

RCL -Recall to attendant console or to transferring party if user hangs up in consultation call

RCLS - Recalls to ATND suppressed in node without attendant console

Subject Call Detail Recording - Basic Information

Call Detail Recording

Call Detail Transmission

Call Detail Information for Heterogeneous Networks

Subject Call Detail Recording - Usage Examples

CDRE - Call Detail Recording enhanced

Call Detail Recording enhanced Traffic

Call Detail Recording - Account Code

Call Charge Data Display

Call charge data - immediate output

Call charge output

Call Charge Recording-Elapsed Time Display

Central Configuration

Charge Pulse Metering & Sending to Analog Stations

Default Values

DPS Interface Data

INFO 2000 Outcalls

Per-Second Invoicing with Prices in 1/100000 Currency Units

Station Number Modification

Subject Call Detail Recording - COT Parameter

AOCC - Request charges per line for remote station

CATR - Charge transfer via analog CO trunk circuits which are operated as tie trunk circuits in transit

CCTN - Apply trunk number as A number

CDBO - Set record point in network for call data recording

CDFD - Call data recording for PNE lines

DFNN - Use default node number for trunk as a dummy source node number

DPRE - Send dial information actually sent to partner system as destination number with prefix digits to call data recording

DSDL - Don't send diversion LEG information

ICZL - Incoming call data recording by zone or from line

ICZO - Incoming call data recording by zone only

IICB - Ignore incoming billing information element

LWNC - Line protocol without node number

NCDR - No CDR-E-specific signaling messages to partner node

NCHD - No charge data during call

SNBE - Send no billing element to the partner system

TRSC - Trunk sends call charges to source node

Subject COP

COP and COT Parameter

COP Parameter

ALUL - A- to Mu- Law Convertor

COTT - CO-Tone in Transit Traffic

NAAT - North America Analog Trunks

Default values for COP and COT

Organization of COP parameters

Parameter Generation and Signaling for International Markets

Subject COT

COP and COT Parameter

COT Parameter

ADIU - Attenuation of DIUC trunk circuits

AICF - ATND intercept if the call is identified as forwarded

ANNC - Activate local announcement to calling system for incoming seizure of analog trunk

ANS - Trunk signaling answer

ATRS - Activate network loop check with transit counter

BCNE - B-channel negotiation for EDSS1

BLOC - Signal "end-of-dial" to partner nodes

BRAR - Backward Release (of an incoming CO call) if a system-initiated recall to the attendant or night station is not answered

CDN - Call Deflection network-wide

CFBN - Call Forward Busy Networkwide

CFOS - Call forwarding programming for other subscribers

CFTR - Activate, deactivate and check routes for call forwarding in central office

CFVA - Enable connectivity validation for call forwarding destinations in network

CTLN - Prevent controlled line and trunk selection in an external system

CTLS - Controlled trunk and line selection network-wide

CUG - Release Closed User Groups network-wide

DISN - Only display the dialed number on A station display

DSIT - Disconnect Supervision for Incoming Trunk

DTNE - Provide external dial tone to calling system for incoming seizure

ETSC - UUS ETSI conform

FAX1 - Call forwarding from incoming FAX CO lines to Phonemail

FAX2 - Call forwarding from incoming FAX CO lines to Phonemail

FNAN - Enable rerouting for network-wideforwarding on no answer to source node

FWDN - Release rerouting for network-wide call forwarding to source node

ITRN - Internal traffic restriction group (ITR) network-wide

KNDI - Camp-on in DID calls (TC and TT)

KNOR - Knocking override possible

LINC - Handling implicit numbers when connecting to a carrier

LINO - Line with implicit number

LPRN - Permanent station number suppression for EDSS1 CO

LRPM - Line to Phonemail

MFCL - Line with MFC (Multi-Frequency Code) signaling

MICC - MCID call clearing control required

MIIH - Make MCID here, print out MCID locally

MLPR - Multi-level precedence and preemption

NAAT - North America Analog Trunks

NCT - Network Call Transfer

NCTP - Partner node cannot execute network-wide call forwarding after transfer

NIN2 - No multi-level precedence and preemption on trunk

NITO - No intercept in networking transit lines

NLCR - Partner system sends no LCR authorizations in Voice or Fax service

NLHT - No local hold tone, hold tone sent by remote system

NLRD - Partner system sends no LCR authorizations in the Data service

NMLT - No multi-level precedence and preemption on trunk

NOFT - No flagtrace

NOHO - No Hold for NW Conference

NORR - No rerouting with LCR

NOSD - No Simple Dialog Available

NOTO - No Tone for Unsuccessful Call

NOVC - No override on CO connections

NPIS - Numbering Plan ISDN on outgoing trunk calls

NPPR - Numbering Plan PRIVATE on outgoing trunk calls

NPUN - Numbering Plan UNKNOWN on outgoing trunk calls

NQNP - Neighboring node does not support CorNet-NQ network-wide call pickup

NQPI - Neighboring node does not support CorNet-NQ network-wide call pickup information

NTON - Do not connect dial tone or announcement for incoming seizure of analog circuits

OHKQ - Off Hook Queuing for transit connections

PINR - Signal PIN features network-wide

PRI - Network-wide prioritized control of incoming calls at ATND

RCL -Recall to attendant console or to transferring party if user hangs up in consultation call

RCLS - Recalls to ATND suppressed in node without attendant console

RLIN - Receive Trailing LIN digits

SANH - Synchronized Announcement of Non HiPath Switch

SDID - Deactivate partial digit analysis in the device handler, activate single digit direct inward dialing

SECO - Send Emergency Call Outgoing

SIRI - Single ring burst

SPAH - Park system and hold analog connection

SPCM - Define a speech-compressed trunk group

SPSR - Identify lines for a Phone Mail or Voice Mail server

SUPN - Suppress name network-wide

T4WA - Level switching on T reference point for device class TMA4WIRE

TCC - Signal incoming calls on analog tie trunk circuits as trunk calls

TCET - Through-connect a networking transit connection after call extend in call status

TGRE - Control LCR rerouting on the basis of cause values

TR6T -Tones are supplied as in a 1TR6 CO

TNDV - Tone in end-of-dialing signals activates partner device of trunk

TRBA - Transfer before answer to first connection

TWDS - Transfer Allowed without Disconnect Supervision

UUS1 - Implicit user-to-user signaling no. 1

VCMN - Voice compression not allowed

AOCC - Request charges per line for remote station

CATR - Charge transfer via analog CO trunk circuits which are operated as tie trunk circuits in transit

CCTN - Apply trunk number as A number

CDBO - Set record point in network for call data recording

CDFD - Call data recording for PNE lines

DFNN - Use default node number for trunk as a dummy source node number

DPRE - Send dial information actually sent to partner system as destination number with prefix digits to call data recording

DSDL - Don't send diversion LEG information

ICZL - Incoming call data recording by zone or from line

ICZO - Incoming call data recording by zone only

IICB - Ignore incoming billing information element

LWNC - Line protocol without node number

NCDR - No CDR-E-specific signaling messages to partner node

NCHD - No charge data during call

SNBE - Send no billing element to the partner system

TRSC - Trunk sends call charges to source node

COT parameter organization

Default values for COP and COT

Parameter Generation and Signaling for International Markets

Subject Groups

Audible Ringing on Rollover Lines

Call Pickup

CHESE - Integrated Executive/Secretary System

CHESE/Team Functions Network-wide

Class of service switch-over COSX

COM Group Call

COM Group Speaker Call -Two-Way

Hunt Group

Hunt group network-wide

Keyset Preview Key

Integrated key functionality / multi line access

Parallel Ringing - One Number Service (ONS)

Personal Device Group

Speaker Call - One-Way - Broadcast

CUG - Release Closed User Groups networkwide

Subject OpenScape 4000 Assistant

Account Management

Subject IP

Access Point Emergency (APE)

Different Time Zones (DTZ)

H323 / H323 Annex Connectivity

HiPath Cordless IP

HiPath Feature Access (HFA)

Gateways HG 3500 and HG 3575

IP Distributed Architecture (IPDA)

IP Terminals

Large Enterprise Gatekeeper (LEGK)

Mobile HFA

OpenScape Access, OpenScape Branch

OpenScape 4000 SoftGate

Payload Switching DMC

RG 8350a

Separate LAN Connectivity for Administration and VoIP

Signaling and Payload Encryption (SPE)

SIP Connectivity

T.38 Fax

Subject Multi Level Precedence and Preemption (MLPP)

Administration

Feature Description

Generic Switching Center Requirements (GSCR)

Overview

Specific terminology

User interface

Subject Networking

Basic Principles

Alternate Routing on Error

Analog Trunking USA

ANIF Automatic Number Identification

Automatic Node Topology Detection

Cornet NQ interworking with DPNSS1

CorNet-VN (CorNet Virtual Networking)

COP and COT Parameter

COP Parameter

ALUL - A- to Mu- Law Convertor

COTT - CO-Tone in Transit Traffic

COT Parameter

ANS - Trunk signaling answer

ATRS - Activate network loop check with transit counter

BLOC - Signal "end-of-dial" to partner nodes

CDN - Call Deflection Networkwide

CFBN - Call Forward Busy network-wide

CTLN - Prevent controlled line and trunk selection in an external system

CTLS - Controlled trunk and line selection networkwide

CUG - Release Closed User Groups networkwide

DTNE - Provide external dial tone to calling system for incoming seizure

FNAN - Enable rerouting for networkwide forwarding on no answer to source node

FWDN - Release rerouting for networkwide call forwarding to source node

ITRN - Internal traffic rescriction group (ITR) networkwide

KNOR - Knocking override possible

LPRN - Permanent station number suppression for EDSS1 CO

MFCL - Line with MFC (Multi-Frequency Code) signaling

NCT - Network Call Transfer

NCTP - Partner node cannot execute networkwide call forwarding after transfer

NIN2 - No multi-level precedence and preemption on trunk

NLCR - Partner system sends no LCR authorizations in Voice or Fax service

NLRD - Partner system sends no LCR authorizations in the Data service

NOHO - No Hold for NW Conference

NORR - No rerouting with LCR

NOTO - No Tone for Unsuccessful Call

NOVC - No override on CO connections

NPIS - Numbering Plan ISDN on outgoinging trunk calls

NPPR - Numbering Plan PRIVATE on outgoinging trunk calls

NPUN - Numbering Plan UNKNOWN on outgoinging trunk calls

NQNP - Neighboring node does not support CorNet-NQ networkwide call pickup

NQPI - Neighboring node does not support CorNet-NQ networkwide call pickup information

OHKQ - Off Hook Queuing for transit connections

PINR - Signal PIN features networkwide

RCL -Recall to attendant console or to transferring party if user hangs up in consultation call

SANH - Synchronized Announcement of Non HiPath Switch

SIRI - Single ring burst

SPAH - Park system and hold analog connection

SUPN - Suppress name networkwide

T4WA - Level switching on T reference point for device class TMA4WIRE

TCET - Through-connect a networking transit connection after call extend in call status

TGRE - Control LCR rerouting on the basis of cause values

TR6T -Tones are supplied as in a 1TR6 CO

TNDV - Tone in end-of-dialing signals activates partner device of trunk

TRBA - Transfer before answer to first connection

Country-Specific Connection Techniques With Analog Trunks

Customer Groups, Shared Systems CUG

DTMF Dialing

ECMA QSIG Protocol

EDSS1 System Interface / Trunk Interface

EURO-ISDN Exchange Interface

Features available throughout the network

Hunt group network-wide

ISDN protocol variants

LCR (Least Cost Routing)

LCR Rerouting

MFC-R2 Signaling

National ISDN Basic Rate Interface (NI BRI)

Network Loops

Number Modification

Parameter Generation and Signaling for International Markets

PIN and Follow-Me Network-Wide

Preventing connections

Public PRI Networking

Public Network Exchange Signalling DTMF (Suffix Dialling)

RefTa Synchronisation

Restricted Call Duration for Transit Calls

Route Optimization

S0/S2 Trunk Parameterization

Satellite Paths Limiting

Screening on the EDSS1 Trunk Interface

Single Point of Access (SPoA)

Transmission and Loss Plan

Trunk Access with the STMA When Using the ATM Networking V2.0 Feature

Trunk to Trunk Supervised Connection

Virtual Numbering (VNR)

Voice Compression

Subject Non Voice

Fax Machine

Number Conversion

FAX1 - Call forwarding from incoming FAX CO lines to Phonemail

FAX2 - Call forwarding from incoming FAX CO lines to Phonemail

Subject System

AMO Authorizations in the PBX

AMO Caching

Call Forwarding

Device Switching

DIMSU Warning

Editing Line Circuits

Emergency Call

Extended Access Protection (Login)

LAN Monitoring

Flash Boards: Load Behavior

Loadware Variants

Logical Partitioning in HiPath 4000 Systems

Optional Patches

Partial Digit Analysis TWABE

Power Fail Interrupt Settings

Routes

Recovery of peripheral units

Subscriber Search Enhancements

System Backup & Restore

Timers

KNDI - Camp-on in DID calls (TC and TT)

MLPR - Multi-level precedence and preemption

NMLT - No multi-level precedence and preemption on trunk

Subject Terminals

Attendant Light

Automatic Number Identification (ANI)

Autoset Relocate

Babyphone

Block Dialing

Buzz

Call forward no reply after transfer

Call forward no reply and rerouting
Call Hold analog
Call ID (Name and Number) on Analog Port with PRI NI2 Calls
Calling Line Identification Enhancements
Calling Line Ident. Restriction (CLIR)
Calling Line Identification Translation
Call log for optiPoint 410/420, OpenStage
Call Parking
Call Waiting for Anate
Connect Key
Controlled Trunk and Line Selection
Data Security at the Terminal
Desktop Callback Idle Display Option
Dictation Equipment DICT
Digital Station with S0 Interface
Direct Station Selection (DSS)
Disable Flash on Analog Phones
Disable MW Lamps on OPS
Display of calling party number in Call Center
DNIS (Directory Number Identification Services)
DSS 1 Terminals
E911 Emergency Call
Emergency Call
Emergency Override/Disconnect
Entrance Telephone with Door Opener
EURO-ISDN Terminals
Executive features
Flexible optiPoint Display
Hotline/Off-Hook Recal
Ignore call forwarding
Malicious Call Identification/Tracing
Manual Hold of Consultation
Multilingual User Interface
Name and Organization to a Number (ORG Assigning)
Number Identification
On Hook Transfer per User or a Group of Users
OpenStage TDM

OpenStage Busy Lamp Field for optiPoint 500

Parallel Ringing - One Number Service (ONS)

Personal Device Group

PIN (Personal Identification Number)

PNT E for Connecting Standardized S0 Telephones

Public Address System

Redial

Repeat ID Key

S2 station configuration

Smart Card Application

Speaker Call - One-Way

Speaker Call - One-Way - Broadcast

Special Ring Tone depending on Caller

Speed Dialing

Stations

Station Controlled Conference

Station Relocation

Step by Step Dialing

Suffix-Dialing

Suppression of the FWD destination at the caller's display

Transfer before Answer ex Call State

User Signaling for the U.S. Market

User-to-User Service

Variable Call Forwarding No Reply

Witness facility

CFOS - Call forwarding programming for other subscribers

DISN - Only display the dialed number on A station display

ETSC - UUS ETSI conform

MICC - MCID call clearing control required

MIIH - Make MCID here, print out MCID locally

UUS1 - Implicit user-to-user signaling no. 1

2 System

2.1 AMO Authorizations in the PBX

2.1.1 Feature Description

A "required execution authorization", called a class, is permanently assigned to each AMO action. A user can only start an AMO action if the class of the AMO action is included in the set of his or her execution rights. If the authorizations are not sufficient, an error message appears and the user cannot perform the AMO action.

The system administrator assigns one or more of the execution rights to each user ID; these authorize the user of the ID to execute specific MML commands (AMO actions) (see Figure 1).

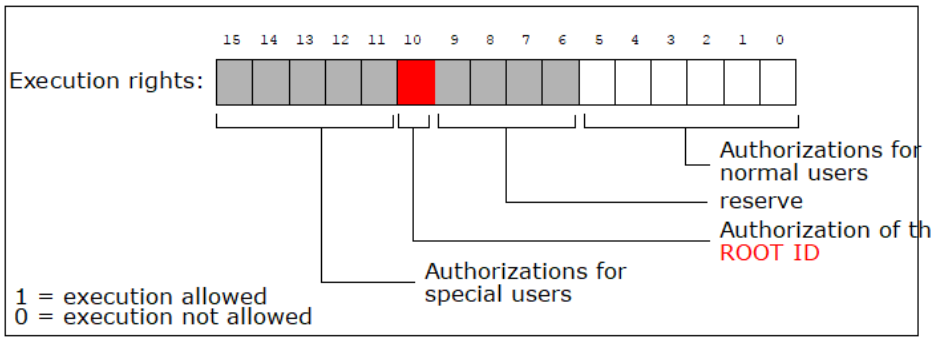


Figure 1: Breakdown of User Execution Rights

It is possible to use the AMO AUTH at any time to grant and change the AMO authorizations for individual actions if the user has the authorization needed to do this (see chapter with log in concept).

2.1.2 Service Information

- If no other parameters are specified when calling the AMO AUTH, the user receives a list of all system AMOs with their corresponding actions.
- It is possible to administer the classes of the AMO actions.
- As a default, a user must have an ID with class of service 10, which is usually the ROOT ID, to change the classes of service.
- Any change to a class affects both AMO languages simultaneously.
- To be able to perform an AMO action, the user must explicitly have the authorization because there is no longer a hierarchy (for example, class 4 does not automatically include classes 1 to 3).

2.1.3 Generation (Example)

- Requesting all AMO action classes in a system:

```
DISPLAY-AUTH:;
H500: AMO AUTH   STARTED
                       CLASS OF

  AMO   ACTION          SERVICE

  ---------------------------
  ACMSM ADD                4
  ACMSM CHANGE             4
  ACMSM DELETE             4
  ACMSM DISPLAY            4
  ACMSM REGENERATE         4
  AFR   ACTIVATE           5
  ...
```

- Display the current AMO action classes for the AMO LDPLN:
  `DISPLAY-AUTH:AMO="LDPLN";`
- Change the current AMO action class for "ADD" for the AMO LDPLN to 5:
  `CHANGE-AUTH:AMO="LDPLN",ACTION="ADD",CLASS=5;`

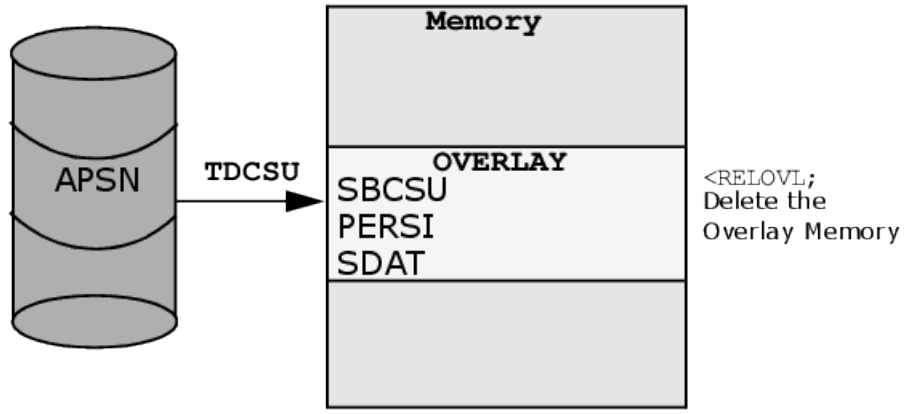
2.1.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
AUTH	AMO	d	Noun: Auswahl eines AMOs
	AMO	e	Noun: selection of an AMO
	AKTION	d	Verb: Auswahl einer Aktion innerhalb des AMOs
	ACTION	e	verb: selection of an action within the AMO
	TYP	d	Verzweigunsparameter fuer Ausgabeeinschraenkung
	TYPE	e	branching parameter for restricting output
	KLASSE	d	neue Ausfuehrungsberechtigung
	CLASS	e	new execute permission

2.2 AMO Caching

2.2.1 Overview

The following description of the new overlay handling concept is based on the AMO overlay handling, but the concept in general effects all kind of overlays.



Loaded AMO's remain in a cache memory until there is nor more free space for new ones to be loaded or the system command RELOVL to remove the overlay memeory is issued.
With AMO DBC the memory for the overlay can be configured

AMO Subsystems are kept loaded until a predefined limit is exceeded even if they are still not in use. The limit is defined by the number of slots (selectors) and the amount of memory all loaded subsystems occupy.

The limits for SLOT and MEM can be defined with new parameters of AMO DBC processor specific (ADPSLOT, SWUSLOT, MONOSLOT, ADPMEM, SWUMEM, MONOMEM). If the parameter values are set to zero, the old behaviour is performed.

System command RELOVL

The new overlay handling concept requires the new command **RELOVL** to release all currently loaded overlays by user request. **RELOVL** is a system command like the well known system commands **TSN**, **BREAK**, etc. and can be entered any time these commands can be entered. This is at

- session input prompt "<"
- system session prompt "PLEASE ENTER COMMAND <<"

RELOVL will also work in the case of old overlay handling behaviour (zero values for SLOT and MEM).

When **RELOVL** is entered by a user

- all overlays that are still not in use are released immediately
- all overlays which are still in use are marked to be released after the last using process ended
- a new process which wants to use a marked overlay will be delayed or rejected until the marked overlay is released

2.2.2 Service Information

- With EXEC- DBC a standard configuration is made depending on the system type
- The Technician may only change the configuration under the instructions of developement.
- When the memory is to small administration runs slower.
- When the values for Overlay are set to zero then the old procedure is used.

2.2.3 AMO Usage

```
CHANGE-DBC:ADPSLOT=200,SWUSLOT=200,MONOSLOT=200,ADPMEM=10,
SWUMEM=10,MONOMEM=10;
```

2.2.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
DBC	ADPSLOT	d	Anzahl der Slots für den ADP
	ADPSLOT	e	Number of slots for ADP processors
	SWUSLOT	d	Anzahl der Slots für die SWU
	SWUSLOT	e	Number of slots for SWU processors
	MONOSLOT	d	Anzahl der Slots bei Mono Prozessoren
	MONOSLOT	e	Number of slots for mono processors
	ADPMEM	d	Overlay Speicher für den ADP (vielfaches von 100KB)
	ADPMEM	e	Overlay memory for ADP (Multiple of 100 KB)
	SWUMEM	d	Overlay Speicher für die SWU (vielfaches von 100KB)
	SWUMEM	e	Overlay memory for ADP (Multiple of 100 KB)
	MONOMEM	d	Overlay Speicher für den Monoprozessor (vielfaches von 100KB)
	MONOMEM	e	Overlay memory for Mono processors (Multiple of 100 KB)

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
RELOLV		d	System Kommando zum Löschen des Overlay-Speichers
	MONOMEM	e	System command to erase the overlay memory

2.3 Device Switching

- Activate a terminal
  `AC-DSSU:`
  `[ONTYPE=param],STNO=number,STNO=number,SVC=param;`
- Reset a terminal:
  `RESTART-DSSU:TYPE=STNO,STNO=number,`

  The commands DEACTIVATE and ACTIVATE are always combined in one job, whereby OFFTYPE=DI and ONTYPE=AUL.

  IMPORTANT: The SVC parameter is only required if a terminal is connected to a S0-Bus.

- Activate station line circuit
  `AC-DSSU:[ONTYPE=param],TYPE=PEN,PEN=pen;`
- Deactivate a station line circuit by specifying a station number
  `DEA-DSSU:[OFFTYPE=param],TYPE=STNO,STNO=number;`
- Reset a terminal:
  `RESTART-DSSU:TYPE=PEN,PEN=lage;`

  The commands DEACTIVATE and ACTIVATE are always combined in one job, whereby OFFTYPE=DI and ONTYPE=AUL

  IMPORTANT: Functional S0-bus terminals cannot be switched separately.

- Deactivate a station line circuit
  `DEA-DSSU:`
  `[OFFTYPE=param],TYPE=PEN,PEN1=pen,REFOFF=param;`

  IMPORTANT: The REFOFF parameter is only relevant if the circuit is the current reference clock supplier.

  The 2nd b-channel of an S0-bus can be deactivated and activated separately.

  ```
  AC-DSSU:TYPE=BCHANS0, PEN1=pen;
  DEA-DSSU:TYPE=BCHANS0,PEN1=pen;
  ```

  The parameters ONTYPE and OFFTYPE are automatically set internally by the DSSU AMO.

- If a circuit is deactivated with soft blocking (OFFTYPE=DC), and the circuit in question is a voice compression destination, the appropriate partner circuit of the VCM board is also soft-blocked.
  `DEA-DSSU:OFFTYPE=DC,TYPE=PEN,PEN1=port equipment number;`
- When (re)activating a circuit which is a voice compression destination, the appropriate partner circuit of the VCM board is also (re)activated.
  `AC-DSSU:[ONTYPE=param],TYPE=PEN,PEN1=port equipment number;`

2.4 DIMSU Warning

2.4.1 Feature Description

Requirements:

An alarm is created when DIMSU parameters usage initiated by AMOs or by subscriber activities approaches 90 % or 100% or if 10% of DIMSU parameter is available again.

When the DIMSU parameters **EXTNAME**, **NAME**, **ORG**, **CFWDEST**, **KEYSYS**, **STN**, **OPTCC**, **OPTEXP**, **DPLNCD**, **PUGR**, **ACDAGT**, **ACDGRP**, **ACDLOGON**, **ACDPRIM**, **ACDRT**, **ACDRTX**, **ACDSHIFT**, **DNI**, **DPDNI** reach 90% of usage a minor alarm is to be created. A major alarm indicates that 100% of a DIMSU parameter is used. If 10% are available again the previously activated alarm has to be reset.

AMOs using memory of the DIMSU parameters are:

- AMO PERSI,
- AMO ZIEL,
- AMO ACTDA,
- AMO KCSU,
- AMO SBCSU,
- AMO SXSU,
- AMO AUN,
- Flexrouting AMO ACDRT,
- AMO ACDRS-rs,
- AMO ACDRS-ds and
- AMO DNIT.

Subscriber adtivities:

Activate a call forwarding destination or logging on/off of ACD agents.

2.4.2 Service Information

DB calculates the percentage of usage of the DIMSU parameters and sends a message to SysDep to generate an alarm when 90%, 100% are used or 10% are free again. To avoid an overflow of messages only one 90%-message is sent. This is triggered by a flag per parameter. For this purpose 256 bytes of DB_D_RESERVE_CC_TBL (10) are used.

The flags are reset after a restart (reload, hard restart or soft restart). That means that the alarm messages could occur again, when the DIMSU parameter are used although they has been sent already before the restart.

If the value of a DIMSU parameter is changed by AMO DIMSU the flags are reset. The alarm message could occur again afterwards.

The existing SWU central alarm 24 (SYSTEM MESSAGES) will be assigned to the DIMSU warning messages. The error counter of this alarm will be incremented by 8 in case of 90% DIMSU parameter usage, by 10 in case of 100% usage and it will be reset to 0 if 10% are free again. After proper setting of VADSU (see administration part) this results minor, major or no alarm depending on the DIMSU warning messages.

Examples for the alarm messages are:

- Minor alarm:
  ```
  F4016 M4 N0062 NO ACT BPA DB ADVISORY 06-11-23 13:35:16
  ALARM CLASS:CENTRAL:024
  FORMAT:33
  90% OF DIMSU PARAMETER ORG/ORG USED
  ```
- Major alarm:
  ```
  F4016 M4 N0063 NO ACT BPA DB ADVISORY 06-11-23 13:40:59
  ALARM CLASS:CENTRAL:024
  FORMAT:33
  100% OF DIMSU PARAMETER ORG/ORG USED
  ```
- No alarm (alarm is reset):
  ```
  F4016 M4 N0064 NO ACT BPA DB ADVISORY 06-11-23 13:46:25
  ALARM CLASS:CENTRAL:024
  FORMAT:33
  10% OF DIMSU PARAMETER ORG/ORG AVAILABLE AGAIN
  ```

2.4.2.1 Restrictions

This feature is not possible when the optional diagnosis patches s20362, s20405, s20416, s20417, s20419 with activation flag 52 are active, because these patches use DB_D_RESERVE_CC_TBL too.

2.4.2.2 Remarks

For DIMSU parameter values < 10 the percentage figures in the first and third alarm messages are not exact.

2.4.3 Generation (Example)

The settings for the SWU cantral alarm 24 (SYSTEM MESSAGES) has to be changed at each customer who needs the alarm in case of DIMSU warning:

```
CHANGE-VADSU:ALARMGR=CENTRAL,ALARMNO=24,THRESHD1=8,
THRESHD2=10,TIME1=10,TIME2=10;
```

Manual deletion of the alarm might be necessary after changing the DIMSU parameters:

```
DELETE-GRA:UNIT=BP,ALARMNO1=24;
```

2.4.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
VADSU	SCHWELL1	d	Schwellwert fuer nichtdringenden Alarm
	THRESH1	e	threshold for minor alarm
VADSU	SCHWELL2	d	Schwellwert fuer dringenden Alarm
	THRESH2	e	threshold for major alarm
VADSU	ZEIT1	d	Validierungszeit fuer nichtdringenden Alarm
	TIME1	e	validation time for minor alarm
VADSU	ZEIT2	d	Validierungszeit fuer dringenden Alarm
	TIME2	e	validation time for major alarm
GRA	ALARMNR1	d	Alarmnummer 1
	ALARMNO1	e	Alarm number 1

2.5 Editing Line Circuits

2.5.1 Introduction

You can use AMO TACSU, AMO TDCSU and AMO TSCSU to configure and edit the line circuits in an existing trunk group.

The line-specific parameters are grouped into various classes and are assigned with the AMO COP (Class of Parameter). The call processing parameters of the line circuits are assigned with the AMO COT (Class of Trunk).

The COS (class-of-service) is relevant for transit and satellite PABX traffic. Only the direct trunk access and tie-trunk classmarks are evaluated. If you want to prevent a trunk from being seized with a tie trunk, you must remove the direct trunk access classmark from the tie trunk's COS (AMO COSSU).

Use the AMO BUEND to define a trunk group. All line circuits in a trunk group must have identical properties. The AMO TACSU, AMO TDCSU and AMO TSCSU are used to assign line circuits to a trunk group. You can use the AMO BUEND's **NO** parameter to set the maximum number of line circuits/B channels to be configured. Changes to line circuit parameters are automatically saved by the AMO TACSU, AMO TDCSU and AMO TSCSU to the memories of all line circuits assigned to this trunk group.

Outgoing routes are defined with the AMO RICHT and THE LCR AMOs.

A trunk group may be assigned to several routes.

However, a line circuit or a B channel group may only be assigned to one trunk group.

AMO TACSU

The AMO TACSU handles all analog trunk circuits, tie-line circuits and satellite PABX tie trunks.

AMO TDCSU

The AMO TDCSU handles the digital circuits (S0, S1 or S2).

AMO TSCSU

The AMO TSCSU edits all line circuits for special configurations (APSE).

2.5.2 Adding an Incoming Line Circuit

2.5.2.1 Analog Line Circuits

- Add the module configuration data (peripheral line module):
  `AD-BCSU:MTYPE=PER,LTU=number,SLOT=number,PARTNO=string, [LWVAR=string];`

  IMPORTANT: As a rule, line modules are loaded with the loadware for Germany. Some modules, however, require different loadware variants in order to comply with PTT requirements in foreign countries (e.g. SLMA Q2141-X). The parameter 'LWVAR' can be used in order to specify the required loadware variant when the modules are configured. For a list of possible loadware variants for each module, please consult the appropriate module description. Once the module has been configured, the loadware variant can be changed with the AMO ZAND.

- Assign a class of service:
  `AD-COSSU:AVCE=param;`
- Assign a class of parameter (device handler parameters):
  `AD-COP:PAR=param;`
- Assign a class of trunk
  `AD-COT:PAR=param;`
- Lines for incoming traffic only are normally not assigned to trunk groups.
- Assign an analog line circuit:
  `AD-TACSU:PEN=pen,COTNO=number,COPNO=number,LCOSV=number, LCOSD=number, DEVTYPE=<circuit_type>,DEV=<circuit_type>;`

2.5.2.2 Digital Line Circuits

Digital line circuits that signal incoming traffic with ANY_CHANNEL (for example, connections to fax servers) require special configuration for incoming traffic:

- Each line circuit must be configured in a separate trunk group.

- As usual, these trunk groups are grouped together to form an LCR route for outgoing traffic (as described under LCR).
- Afterwards, each of these trunk groups must also be assigned an individual route (AMO RICHT).
- A separate LDAT entry must be created for each of these routes (AMO LDAT).

NOTICE: Each trunk group configured in AMO RICHT must have an LDAT entry. If this is not done the following advisory message is displayed each time when changing, adding, displaying or deleting LDAT:

```
H25: NOT ALL TRUNKS ENTERED IN RICHT ARE
 CONFIGURED IN LDAT(LROUTE:@@@@@) TOO
    THIS CAN LEAD TO PROBLEMS FOR TRUNK B-
CHANNEL SEARCH,
    THIS IS ESPECIALLY IMPORTANT FOR IP-
TRUNKING TO WORK CORRECTLY.
    !! ALL TRUNKS CONFIGURED IN RICHT SHOULD BE
 ENTERED IN LDAT !!
```

Example:

A configuration is connected to the OpenScape 4000 with three line circuits. The examples only contain the parameters essential for comprehension.

- Add trunk groups:

```
AD-BUEND: TGRP=<bunr1>,NO=<B-channel
 number>,NAME="<trunk group name>";
AD-BUEND: TGRP=<bunr2>,NO=<B-channel
 number>,NAME="<trunk group name>";
AD-BUEND: TGRP=<bunr3>,NO=<B-channel
 number>,NAME="<trunk group name>";
```

- Add line circuits:

```
AD-TDCSU:PEN=<pen1>,DEV=<S0CONN/S2CONN>,
TGRP=<bunr1>,BCNEG=N,...;

AD-TDCSU:PEN=<pen2>,DEV=<S0CONN/S2CONN>,
TGRP=<bunr2>,BCNEG=N,...;

AD-TDCSU:PEN=<pen3>,DEV=<S0CONN/S2CONN>,
TGRP=<bunr3>,BCNEG=N,...;
```

- Add an outgoing route to the server:

```
AD-RICHT:LRTE=<lrtgnr>,TGRP1=<bunr1&tgrp2&tgrp3>,...;
```

- Add outgoing LCR routes:

```
AD-LDAT:LROUTE=<lrtgnr>,TGRP=<bunr1>,...;
AD-LDAT:LROUTE=<lrtgnr>,TGRP=<bunr2>,...;
AD-LDAT:LROUTE=<lrtgnr>,TGRP=<bunr3>,...;
```

- Finally add additional routes for incoming traffic with "Any Channel":

```
AD-RICHT:LRTE=<lrtgnr_b1>,TGRP1=<bunr1>,...;
AD-RICHT:LRTE=<lrtgnr_b2>,TGRP1=<bunr2>,...;
```

```
AD-RICHT:LRTE=<lrtgnr_b3>,TGRP1=<bunr3>,...;
```

- To conclude, add the associated LCR routes for incoming traffic:

```
AD-LDAT:LRTE=<lrtgnr_b1>,TGRP=<bunr1>,...;
AD-LDAT:LRTE=<lrtgnr_b2>,TGRP=<bunr2>,...;
AD-LDAT:LRTE=<lrtgnr_b3>,TGRP=<bunr3>,...;
```

Explanation:

If CHI=ANY CHANNEL appears in an incoming SETUP, the trunk group entry is used to determine the route last configured for this trunk group. The mechanisms used for an outgoing connection are applied to this route to find an available B channel.

2.5.3 Adding an Outgoing Line Circuit

- Add the module configuration data:
  `AD-BCSU:MTYPE=PER,LTU=number,SLOT=number,PARTNO=string;`
- Assign a class of service:
  `AD-COSSU:AVCE=param;`
- Assign LCR class of service for voices:
  `CHA-COSSU:TYPE=LCOSV,LCOSV=number,ALCR=number,LRCOPTS=param;`
- Assign LCR class of service for data:
  `CHA-COSSU:TYPE=LCOSD,...`
- Assign a class of parameter:
  `AD-COP:PAR=param;`
- Assign a class of trunk:
  `AD-COT:PAR=param;`
- Assign a trunk group:
  `AD-BUEND:NO=number;`
- Assign a line module and allocate it to a trunk group:
  `AD-TACSU:PEN=pen,COTNO=number,COPNO=number,LCOSV=number, LCOSD=number,DEVTYPE=(circuit type),DEV=(circuit type);`
- Configure the LCR route as described under LCR

2.5.4 Configuring MFC Trunks

- Add the module configuration data:
  `AD-BCSU:MTYPE=PER,LTU=number,SLOT=number,PARTNO=string;`
- Add the module configuration data for a SIU-TYPE 3:
  `AD-BCSU:MTYPE=SIUP,LTU=number,SLOT=number,PARTNO=string, MFCTYPE=param,[FCTID=number];`
- Assign a class of service:
  `AD-COSSU:AVCE=param;`
- Assign a class of parameter:
  `AD-COP:PAR=param;`
- Assign a class of parameter:
  `AD-COP:PAR=param;`
- Assign a trunk group:
  `AD-BUEND:NO=number;`

- Assign a number to the MFC variant (this number must later be entered for the parameter MFCVAR in the AMO TACSU).
  `COP-MFCTA:MFCVARI=number;`
- Add the MFC trunk:
  - Add incoming MFC trunk
    `AD-TACSU:COTNO=number,COPNO=number,DEVTYPE=(circuit type),DEV=(circuit type);`
  - Add bothway MFC trunk
    `AD-TACSU:COTNO=number,COPNO=number,TGRP=number,DEVTYPE=(circuit type),DEV=(circuit type);`
- Configure the LCR route as described under LCR

Changing the MFC Variant Tables

`CHA-MFCTA:MFCVAR=number,TYPE=MFCVAR,OPT=MISC,{BACKTYPE=param,FORWTYPE...};`

Changing the MFC Tables

`CHA-MFCTA:MFCVAR=number,TYPE=TBLB,OPT=...;` (Backward)

`CHA-MFCTA:MFCVAR=number,TYPE=TBLF,OPT=...;` (Forward)

Changing the MFC Timers

Timers for MFC signaling and for testing (DTMF/MFC tones).
`CHA-DTIM1:TYPEDH=MFCDID,{RNG=number,BUSY=number,TSUPV1=number,..};`

2.5.5 Deleting a Trunk

- Deactivate trunk:
  `DEA-DSSU:TYPE=PEN,PEN1=pen;`
- Delete trunk:

  `DEL-TACSU:PEN=ltg-ltu-slot-cct;` (for analog trunks)

  `DEL-TDCSU:PEN=ltg-ltu-slot-cct;` (for digital trunks)

  `DEL-TSCSU:PEN=ltg-ltu-slot-cct;` (for special trunks in the SWU)

2.6 Extended Access Protection (Login)

Sessions can only be started with the right user ID. The user must identify himself by user name and password which makes the corresponding user ID known to the system. Certain COS are assigned to every user ID allowing the user to execute certain MML commands. During logging of the MML commands, the identification number of the ID (user ID = UID) calling the commands is registered. A privileged user, the so called system administrator, administers the user IDs.

2.6.1 System Administrator Tasks

2.6.1.1 Initialized User IDs

One user ID is initialized in the ADS data base of the application program system (APS):

1) ROOT with Password XXXXX

To make it impossible for unauthorized people to use the initialized ID, the passwords with the ROOT ID should be changed immediately after a new APS variant has been uploaded to a customer system!

The initialized user ID ROOT always has the user ID 1 and cannot be deleted. ROOT is also used for internal command processing.

2.6.1.2 Displaying User IDs

The user IDs configured in the system can be listed using the `DISPLAY-USER` command.

Input:
```
DISPLAY-USER;
```

Output:

```
USER TABLE
   |UID|  NAME    |     AUTH        |  STATUS  |    OPTIONS
   |  RE-  | LOCK- |
   |   |          |111111           |          | | | | | | |
 | | TRIES | TIME  |
   |   |          |5432109876543210|          |L|R|C|F|P|E|
T|I|       | (MIN) |
   +===+==========+================+==========+=+=+=+=+=+=
+=+=+=======+=======+
   | 1 | ROOT     |     XXXXXXXXXXX| INIT.    |X X X   X X
   |    99 |    0  |
   | 2 | MAYER    |          XXXXXX|          |X X X X X X
   |    99 |    0  |
   | 3 | SCHMIDT  |             XXX|          |X X X X X X
   |    99 |    0  |
   | 4 | SMITH    |             XXX|          |X X X X X X
  X|    99 |    0  |
```

2.6.1.3 Adding New User IDs

New user IDs can be set using AMO USER. The maximum number of IDs is 99. The AMO automatically assigns the user ID. The new user IDs cannot be used immediately. The system administrator must assign a preliminary password using PASSW. Exceptions are user IDs without the option P (see chapter Options).

2.6.1.3.1 User Name

At the user interface the user identity is defined by the user name (login name) which may consist of maximum 8 characters (capitals, digits and special characters in any combination). The name must be unambiguous and assigned only once. The user will then login using this user name.

The system administrator assigns and also modifies, if required, the user names in agreement with the users. Every user should have his/her own user ID. This helps in cases of unauthorized access to determine which user ID was used for the access attempt.

2.6.1.3.2 Rights Assignment

The system administrator assigns one or more executional rights to every user ID. These rights allow the user to execute certain MML commands (AMO actions) (see Figure 2).

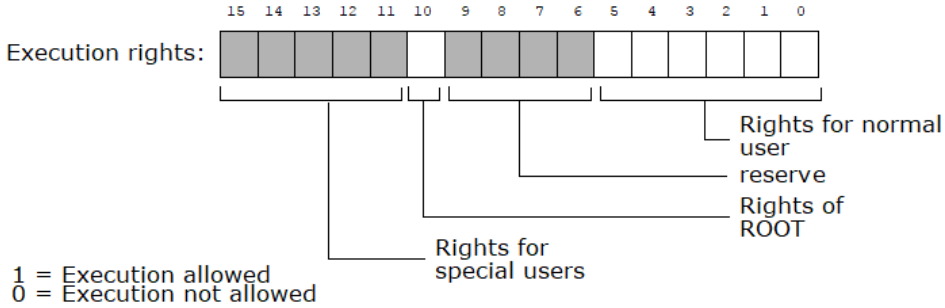


Figure 2: Execution rights of a user

A "necessary execution right" also known as class, is assigned to every AMO action. A user can call an AMO action only if the class of the AMO action is contained in his/her catalogue of execution rights. If the rights are insufficient, an error message is displayed and the AMO action is not performed. The action can only be carried out, if a user ID with the required rights is used.

In this system variant the classes of AMO actions are predefined. They are based on the old hierarchical password class structure. It is useful to follow the previous password classes of PASSW AMO when assigning rights (see). The lowest right is 0. Rights > 10 are reserved for special users.

Table 1: Assignment of rights following password classes of AMO PASSW

AMO PASSW Class	Rights
5	0&&5
4	0&&4
3	0&&3
2	0&&2
1	0&1
0	0

The advantages of the new access concept are:

- Protection of AMO actions with class 0.
- Access control is no longer hierarchical.

The system administrator can modify the AMO action classes using AMO AUTH.

2.6.1.3.3 Options

One or more options can be set for one user ID using the OPTIONS parameter. There are the following options:

Option	Meaning
L	Local use. The ID can be used locally (devices CON1 to CON6).
R	Remote use.The ID can be used from remote AM (device FAS) (modem or LAN).
C	Change own password.The user can change his/her password.
F	Forced password change. The user is forced to change the temporary password.
P	Password required. The user has a password (without password means: no password prompting during login).
E	Erasable. The ID can be deleted.
T	Timeout. Forced logoff after timeout (after ca. 2 minutes).
I	International session language (English).

When new user IDs are set the options L to E (all options with the exception of option T) and, if required I, are set as defaults. The default value for option I, used to specify the session language, depends on the session which sets the ID.

2.6.1.3.4 Limiting unauthorized Logon Attempts

Every device and every user ID has a counter which counts the number of unsuccessful login attempts by a user ID. The counter is reset with every successful attempt. Every counter has a limiting value and a disable time. As soon as the limiting value is reached the device or ID is disabled for the duration of the disable time. The limiting values and disable times can be set individually for the IDs and devices.

2.6.1.3.5 Disabling the User ID

The limiting value and the disable time for a user ID are set using the **ATTEMPTS** and **DISTIME** parameters in AMO USER. The limiting value in **ATTEMPTS** can be set from 1 to 99 and the disable time in **DISTIME** from 1-9999 minutes. **DISTIME=0** means: "no disable", the number of unauthorized access attempts is unlimited in this case. **DISTIME= *** means: "permanent disable".

IMPORTANT: Automatic disabling of user IDs could result in problems. Unauthorized access attempts could render the IDs useless and block the administration!

2.6.1.3.6 Disabling the Terminal

The limiting value and the disable time for terminals are still set using PASSW AMO and are valid for all terminals.

Input:
`ADD-PASSW:TYPE=LOCK,COUNT=<number>,TIME=<number>;`

The limiting value in **COUNT** can be set from 1 to 99 and the disable time in **TIME** from 0 to 240 hours. **TIME=0** means: "no disable", in this case the number of unauthorized access attempts is unlimited.

2.6.1.4 Deleting User ID

User IDs can be deleted using `DELETE-USER`.

Input:
`DELETE-USER:<name>;`

ROOT cannot be deleted. It is sometimes better to disable an unused user ID instead of deleting it. The ID can no longer be used. But it is possible to reconstruct the user actions on the system (LOGBK AMO), if required.

2.6.1.5 Disabling and Enabling User IDs

User IDs can be disabled using `DEACTIVATE-USER` or released using `ACTIVATE-USER`. It is unimportant, if the ID was disabled manually, with AMO USER or automatically after unsuccessful login attempts.

2.6.1.6 Changing User ID Data

All data which can be set when installing a new ID can also be modified using `CHANGE-USER`. Modification of ROOT data, however, is restricted.

Example: Change executional rights of a user ID.

Input:
`CHANGE-USER:NAME=<name>,AUTH=0&&5;`

2.6.1.7 Configuring Preliminary Password

Newly configured user IDs cannot be used. The system administrator must assign a preliminary password using the system command `PASSW`. Exception: user IDs without option P (see Section 7.1.3.3, "Options").

Input:

IMPORTANT: PASSW must be entered in in upper case!

`PASSW:<name>`

Output:

`NEW PASSW = <password>`

```
PLEASE REENTER NEW PASSWORD
NEW PASSW = <password>
```

During password entry the echo is switched off and the terminal is darkened, the password is therefore not visible during input. The password must be entered twice as typing mistakes cannot be seen due to the darkened terminal. The password setting is immediately effective, EXEC-UPDAT is therefore unnecessary. The password can consist of 8 characters (upper case letters, digits and special characters in any combination). For safety reasons, the minimum length is 6 characters. Shorter passwords are rejected. When a user logs in the first time he/she is forced to change the preliminary password (exception: users without options C or F). Passwords are stored in encoded form only. Decoding is not possible (one-way encoding). The system command PASSW is not recorded in the logbook.

2.6.1.8 AMO PASSW

Passwords are only set or modified using the system command PASSW. The AMO PASSW is now used to set the terminal block, i.e. to set the disable time and the number of password input attempts which result in a terminal block.

Input:

```
ADD-PASSW: TYPE=LOCK, COUNT=<number>, TIME=<number>;
```

All other functions are without meaning.

2.6.1.9 Logging MML Commands

During MML command logging in the logbook the identification number of the ID calling the commands is registered. Using AMO LOGBK and the user ID it is possible to directly search for entries of a certain user.

Input:

```
DISPLAY-LOGBK:UID=3;
```

Output:

```
56 HITS

CONTINUE (Y/N/C): Y



P4711 DEV:CON1 TSN:1234 UID:3 NOUN:BUEND TYPE:START
 TIME:98-03-
01 06:23:45

ADD-BUEND:TGRP=22,NO=30;

  .

  .

  .
```

2.6.1.10 Upload of Existing IDs with APS Exchange

2.6.1.10.1 New APS Version

When a new APS version has been uploaded to the harddisk, all existing user IDs which were stored in the ADS database can be uploaded into the new APS by updating the database.

Input before Reload:
```
EXEC-UPDAT:A1,ALL;
```

This procedure is only possible, when the version and not the variant has been changed.

2.6.1.10.2 New APS Variant

After an upload of a new APS variant the database must be regenerated. For user identifications the REGEN-USER command from the REGEN batch must be uploaded. The initialized user IDs ROOT are not regenerated. After uploading a new APS variant the passwords with the ROOT identifications must be changed immediately, to prevent unauthorized accesses. User IDs with rights > 10 are not regenerated either and must be reconfugured manually.

As the user passwords are stored in the database in encoded form, they cannot be regenerated. Instead, the user IDs are transferred to a backup file in encoded form, and the COPY-USER command is regenerated. After exchange of the APS this command can be used to download the user IDs from the backup file. However, this command only works after an exchange of the APS and as long as no new IDs were installed.

Input before APS exchange:
```
REGEN-USER;
```

Output:
```
COPY-USER;
```

The user IDs are stored in the AMD:UDT file.

Input after APS exchange:
```
COPY-USER;
```

Output:
```
H06: USER ID <name> COPIED

H06: USER ID <name> COPIED

  .

  .

  .
```

The data contained in the file AMD:UDT were uploaded into the database. The ADS must now be updated.

2.6.1.11 User forgets password

If a user forgets his/her password, the system administrator may assign a temporary new password (see chapter: Configure preliminary password). In case the system administrator forgets his/her own password, the following solution is provided. The ROOT ID can be accessed without password, if the service dongle is plugged in and the dongle code word was entered using CODEW AMO.

IMPORTANT: To enter the service code word at least one user ID must still be usable.

2.6.2 User Possibilities

2.6.2.1 Opening a Session (login)

After connection setup with Ctrl-T or LOGON, the user must identify himself/herself with user name and the password. The user name is used to establish the user ID. The entered password is encoded and compared with the one stored under the user ID. Unlike the user name the password is not visible when entered.

Input:

```
<Ctrl-T>

LOGIN = <name>

PASSW = <password>
```

If both the user name and the password are correct, the following message is displayed and the user logged in:

```
----------------------------------------------------------------------

TERMINAL-1                    L O G O N            01-03-98
  14:15:51

----------------------------------------------------------------------

>
```

If one of the two entries is wrong, all entries are rejected with the following message and the input must be repeated:

```
LOGIN INVALID

LOGIN =
```

The user does not know, whether the user name or the password was incorrect.

2.6.2.2 Closing a Session (logout)

A user should always logoff when leaving the terminal, to prevent unauthorized access using the ID of the user. Logoff is always possible by entering either Ctrl-X or LOGOFF:

Input:
```
> <Ctrl-X>
```

Output:
```
-------------------------------------------------------------------

TERMINAL-1                  L O G O F F            01-03-98
  14:18:45

-------------------------------------------------------------------

DISCONNECTED
```

The connection is also closed down. If the option T is set for the user ID (see chapter: Options) the session is automatically closed after a timeout (ca. 2 minutes).

2.6.2.3 Executional Rights

The system administrator assigns one or more executional rights to the user ID. These rights allow the user to execute certain MML commands (AMO actions), (see Figure 2). A "required execution right", also known as class, is fixedly assigned to every AMO action. The classes are predefined. They can be modified by the system administrator using AMO AUTH A user can only call an AMO action, if the class of the AMO action is also contained in his assigned list of execution rights. If not, the following error message is displayed:
```
M43: CLASS INSUFFICIENT, EXECUTION NOT POSSIBLE
```

2.6.2.4 Changing Password

Every user can change his/her password using the system command PASSW (not AMO PASSW):

Input:
```
PASSW;(must be in upper case)
```

Output:

```
OLD PASSW=<password>
NEW PASSW=<password>
PLEASE REENTER NEW PASSWORD
NEW PASSW=<password>
```

During password entry the "Echo" is switched off and the terminal is in non-displaying mode. The password remains invisible during entry. To prevent unauthorized password changes during an opened session, the old password must be entered first. The new password must be entered twice, because typing errors may not be recognized in non-displaying mode.

The password change is effective immediately, EXEC-UPDAT need not be called.

2.6.2.5 Forced Password Change

The system administrator assigns a temporary password to newly installed user IDs. After the first login, the user is forced to change this temporary password. Exceptions: options F, C or P are not set, see Section 7.1.3.3, "Options".

```
PASSWORD EXPIRED - PLEASE ENTER NEW PASSWORD

NEW PASSW = <password>

PLEASE REENTER NEW PASSWORD

NEW PASSW =<password>
```

This new password, changed by the user, is also unknown to the system administrator.

2.6.2.6 Displaying all Open Sessions

Several sessions, opened by several users, can be simultaneously active. Every user can see an overview of all other active sessions, using the TSN function:

Input:

```
TSN;
```

Output:

```
TSN   | NOUN   | LOG DEV | TIME      | USER

------+-------+---------+----------+----------

1004            TASK       14 15 53    ROOT

1013    CHESE   CON 1   *  16 42 25    MAYER
```

2.6.2.7 Cancelling and Deleting AMOs

Every user could cancel or delete hanging AMOs using the BREAK and CANCEL functions. This possibility is restricted as follows to prevent users interfering with other users:

- The AMOs of any user can be cancelled or deleted from ROOT.
- All AMOs started on a terminal can be cancelled or deleted from this terminal.
- Users can (only) cancel or delete those AMOs they themselves have called.

IMPORTANT: Be careful with using BREAK and CANCEL. Cancelling an AMO can cause inconsistencies in the system.

- BREAK: Breaks a running command.
- CANCEL: Cancels the task specified by the task sequence number.

IMPORTANT: CANCEL should only be used if BREAK has failed!

2.6.2.8 Further Important Commands

- RELOVL: Force release of all overlays (e.g. AMOs)
- RELTRPOOL: force tracer to release the trace bufferpool
- RESTART: Soft Restart of processor A1

2.7 Load Behavior of Flash Boards

2.7.1 Feature Description

The load behavior of flash boards can be configured in AMO ZANDE, branches HRBHV (Hard Restart BeHaVior) and LWSRC (**L**oad**W**are **S**ou**RC**e).

The default values are **HRBV=**HRNOLOAD (HardRestartNOLOAD --> which means no reset of periphery and no load during restart) and **LWSRC=**FLASH (loadware ID check is carried out)

In case of a SoftRestart or CC switchover no periphery will be reset and consequently no loadware loaded and the default values remain unchanged.

In case of a Reload the periphery will be **always** be reset and a loadware ID check is done (all values changed via **LOADBHV** are **ignored**).

Changed values are only stored within the DB RAM and are returned to default automatically after **each** Hardrestart or Reload of CC.

That means, changing within branch **HRBHV** will only be used once, if the next restart is a HardRestart.

2.7.2 Service Information

2.7.2.1 General Information

- The CHANGE branch of AMO FUNSU does not have any functionality anymore. However, the branch and its parameters remain. If the user executes CHANGEFUNSU, an advisory message is displayed:
  ```
  Hxx: Administration of the loading behavior of boards is
   moved to CHANGE-ZANDE:TYPE=LOADBHV.
  ```
- After a Hardrestart or Reload in case of CHANGE or DISPLAY-ZANDE following message can be displayed. The command must then be repeated later.

  ```
  F14: FLASH HANDLING NOT YET FINISHED,
  ```

```
    AT THE MOMENT THERE IS NO CHANGE/DISPLAY POSSIBLE.
    PLEASE WAIT UNTIL FLASH HANDLING IS FINISHED.
    (HISTA F4266: "CHANGE OF LOADBHV IN AMO ZANDE NOW
POSSIBLE")
    THIS CAN TAKE SOME MINUTES"
```

- OpenScape 4000 SoftGate/OpenScape Access are not affected by the new load concept. OpenScape 4000 SoftGate/OpenScape Access always loading the loadware locally.

2.7.2.2 Load Behavior

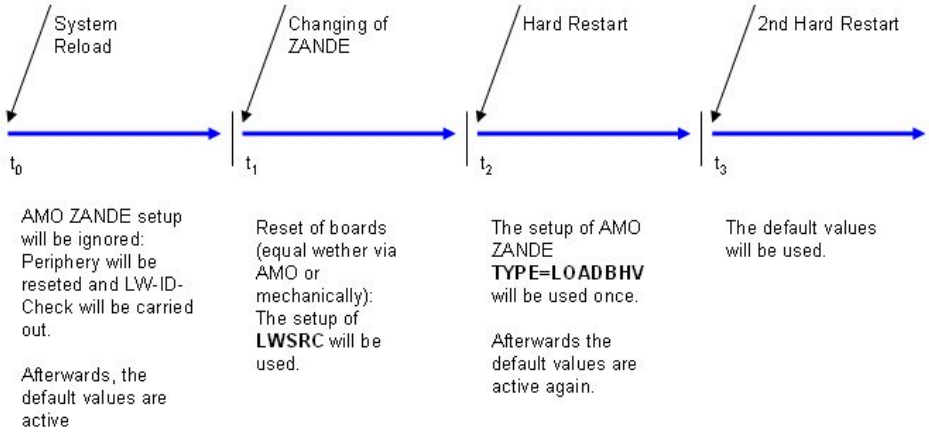


Figure 3: Simplified presentation of load behavior

Restart Scenarios

- `EXEC-REST:TYPE=MODUL,MODUL=BP,RSLEVEL=HARD;`

  The settings from **PIT=HRBHV** are applied.
- **RES-BSSU** or plug the board in and out:

  The settings from PIT=LWSRC will be used
- **RES-USSU** or press Reset button on NCUI

  NCUI: Always a LW-ID-Check is carried out and dependant of this, the loadware will be loaded from hard disk or flash.

  For all other boards within the shelf will used the values from PIT=LWSRC.
- `EXEX-REST:TYPE=MODUL,MODUL=BP,RSLEVEL=RELOAD;`

  A reset of the periphery and LW-ID-Check always is carried out and dependent of this, the loadware will be loaded from hard disk or flash.

2.7.3 Generation (Example)

2.7.3.1 CHANGE-ZANDE

The load behavior of boards can be set with AMO ZANDE:

Table 2: Set load behavior of boards in AMO ZANDE

CHANGE-ZANDE:	TYPE=LOADBHV	
		PIT=HRBHV,LOAD=<param>;
		PIT=LWSRC,[PARTNO=<string>], [FCTID=<number>], LOADDEV=<param>;

IMPORTANT: Settings within **HRBHV** (**H**ard**R**estart**B**eHa**V**ior) only take effect in case of HardRestart. For all other actions the settings from **LWSRC** apply.

Case 1: PIT=HRBHV, LOAD=HRNOLOAD (default)

--> No reset of periphery occurs and loadware won't be loaded new. The settings of load source (**LWSRC**) is also not relevant.

Case 2: PIT=HRBHV, LOAD=LWLOAD

--> A reset of periphery occurs. The load behavior is dependant on settings from load source (**LWSRC**)

The load source is set by branch LWSRC.

Case 3: PIT=LWSRC, LOADDEV=FLASH (Default)

--> A loadware ID check is carried out. If the loadware on the HD is the same as in the flash memory then it will be loaded from the flash memory. In case of different loadwares the loadware will be loaded from the hard disk.

Case 4: PIT=LWSRC, LOADDEV=HD

--> The loadware is loaded from hard disk without any loadware ID check.

IMPORTANT: LOADDEV=HD doesn't apply for NCUI boards. For these boards a loadware ID check always is carried out. An "enforced" loading is done using `EXEC-USSU:TYPE=NCUILOAD, FILES=LW;`.

IMPORTANT: LOADDEV=HD also doesn't apply for OpenScape 4000 SoftGate/OpenScape Access 500 and virtual boards where they will never be loadware loaded in case of HardRestart/Reload.

Optionally within the branch **LWSRC** can be limited for specified boards via **FTCID** and **PARTNO** settings.

- If both parameters are entered, the change will be performed for the specified board.
- If only **PARTNO** is entered, the change will be performed for all board types with that **PARTNO** (even with different FCTIDs).

- Entering only **FCTID** does not make sense and is therefore rejected with an error message:
  `Fxx: FCTID has to be entered together with PARTNO.`
- If neither **PARTNO** or **FCTID** is entered, the change will affect all configured flash boards. A confirmation check is added to indicate that this is the correct intention and the administrator will confirm/reject it.
  ```
  Attention: If PARTNO and FCTID are not entered, all
  configured flash boards will be affected! Are you sure?
   (yes/
  no)
  ```
- OpenScape Access Boards

  If the part number (**PARTNO**) / function ID (**FUNCTID**) entered belongs to a OpenScape Access board, the change will be carried out for the entered OpenScape Access board and also for the corresponding "classical" board.

  The same is also valid conversely (i.e. if the entered board has a corresponding OpenScape Access board, the change will affect the "classical" and also the corresponding OpenScape Access board). In both cases, the following advisory message is displayed:
  ```
  H22: Changes are made for HPA board ^OpenScape access
   board^
  and corresponding classic board ^board^.
  ```

2.7.3.2 DISPLAY-ZANDE

```
DISPLAY-ZANDE:TYPE=LOADBHV,[LIST=<param>];
```

The **LIST** parameter has the following values:

- **ALL**: All flash board types are listed.
- **CONFIG** (default): Only flash board types configured on the system are listed.

Example of output:

```
DISP-ZANDE:TYPE=LOADBHV,LIST=CONFIG;
H500:  AMO ZANDE STARTED

   HRBHV:
   ==========================
   LOAD = LWLOAD

   FLASH:
   ==========================
   PARTNO     FCTID    LOADDEV
   --------   -----    -------
   QXXX1-Y1    0       FLASH
   QXXX2-Y2    0       FLASH
   QXXX3-Y3    1       HD
   QXXX4-Y4    1       HD
   QXXX5-Y5    1       FLASH

AMO-ZANDE-111       SYSTEM DATA - EXTENDED

DISPLAY COMPLETED;
```

```
<
```

IMPORTANT: All displayed changes are only valid until the next HardRestart or Reload. Afterwards the default values are set and displayed again.

OpenScape Access boards:

If one of the boards of a "OpenScape Access and corresponding classical board pair" is configured, both of them are displayed and the following advisory is issued:

```
H21: HPA as well as the corresponding classic board are
displayed in this list even if only one of them is
configured.
```

2.7.3.3 REGEN-ZANDE

The values entered in `CHANGE-ZANDE:TYPE=LOADBHV;` are regenerated in REGEN-ZANDE.

For **LWSRC** branch, only records that differ from the default value are regenerated. If we assume the default **LOADDEV** value (the value in UBGDAT) of the board types in the sample DISPLAY output is **HD**, the REGEN output is as follows:

IMPORTANT: REGEN-ZANDE:TYP=LOADBHV and AMO UPDAT are not possible.

```
REG-ZANDE;
H500:  AMO ZANDE STARTED
...
...(other ZANDE output)
...
CHANGE-ZANDE:TYPE=LOADBHV,PIT=LWLOAD;
CHANGE-ZANDE:TYPE=LOADBHV,PIT=LWSRC,PARTNO=QXXX1-
Y1,FCTID=0,LOADDEV=FLASH;
CHANGE-ZANDE:TYPE=LOADBHV,PIT=LWSRC,PARTNO=QXXX2-
Y2,FCTID=0,LOADDEV=FLASH;
CHANGE-ZANDE:TYPE=LOADBHV,PIT=LWSRC,PARTNO=QXXX5-
Y5,FCTID=1,LOADDEV=FLASH;
AMO-ZANDE-111     SYSTEM DATA EXTENDED

REGENERATE COMPLETED;
  <
```

2.7.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
ZANDE	TYP=LOADBH	d	Ladeverhalten
	TYPE=LOADBHV	e	Load behavior
	PIT=HRBHV	d	Verhalten bei Hard Restart
	PIT=HRBHV	e	Behavior in case of hard restart
	LOAD	d	Mögliche Werte: **HRNOLOAD** (**H**ard**R**estart**NOLOAD**) oder **LWLOAD**
	LOAD	e	Possible values: **HRNOLOAD** (**H**ard**R**estart**NOLOAD**) or **LWLOAD**
	PIT=LWSRC	d	Ladequelle der Loadware
	PIT=LWSRC	e	Loadware source
	LOADDEV	d	Gerät von dem die Loadware geladen wird
	LOADDEV	e	Device the loadware will be loaded from

2.8 Loadware Variants

2.8.1 Feature Description

It is not possible to configure different loadware variants for the same board type within a PBX. After a soft restart the last entered variant is loaded for all boards of this type.

For the configuration of a new board type state the loadware variant in AMO BCSU (parameter LWVAR e.g. 0=FRG, K=USA, if it deviates from the variant which is in the UBGDAT module table). This saves later modifications in AMO ZAND and subsequent loading of the board (see example).

The loadware for the various modules and module functions is stored in files on the hard disk. Various loadware files are located in the following directory: PDS:APSP/LTG.

2.8.2 Configuration (Example)

- It is possible to display the installed loadware variants via the AMO ZAND:
  `DISPLAY-ZAND:TYPE=LOADWARE;`
- The current assignment of a module to loadware (type and variant, etc.) can be displayed via the AMO BGDAT:
  `DISPLAY-BGDAT;`
- Proceed as follows to change the loadware variant for certain board types:
  `CHA-ZAND:TYPE=LOADWARE,LWTYPE=param,LWVAR=param;`
- Reload the boards by switching the boards on and off.

  ```
  DEA-BSSU:[LTG=number],LTU=number,SLOT=number;

  AC-BSSU:ONTYPE=AUL,[LTG=number],LTU=number,SLOT=number;
  ```

  or

  ```
  RESTART-
  BSSU:ADDRTYPE=PEN,[LTG=number],LTU=number,SLOT=number;
  ```

  or

  ```
  RESTART-BSSU:ADDRTYPE=PARTNO,[PARTNO=string],
  [FCTID=number];
  ```

2.8.3 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
BGDAT	SORT	d	Sortiert nach (N Baugruppenname, Q Quellennummer)
	SORT	e	Sorted by (N Boardname, Q Q-number)
ZAND	TYP	d	Auswahl des Datentyps (LOADWARE)
	TYPE	e	Desired system option (LOADWARE)
	LWTYP	d	LOADWARE FUER SATZBAUGRUPPEN UND SIU
	LWTYPE	e	LOADWARE FOR TRUNK MODULES AND SIU
	LWVAR	d	Loadware Variante
	LWVAR	e	Loadware variant

2.9 Logical Partitioning in OpenScape 4000 Systems

Requirements

Prohibit connections between CO trunks and NW trunks of other areas.

Respected Features:

Basic Call, Call Forwarding, Conference and Transfer

Simplified Description:

1. Within the own Area all Devices may use all Features among each other.

2. Over all Areas all Stations among themselves may use all Features.

3. Over all Areas all Stations may use all Features via VoIP Trunk, incoming and outgoing.

4. No Device may use a foreign PSTN Trunk with any feature.

5. Mobile Users are handled as the physical stations, where the mobile users are logged in.

Functionality Table:

Source Device	Destination Location	Destination Device	Permission
All Devices	Within own Area	All Devices	Allowed
STN	To foreign Area	STN	Allowed
STN	To foreign Area	VoIP Trunk (NW)	Allowed
VoIP Trunk (NW)	To foreign Area	STN	Allowed
All Devices	To foreign Area	PSTN Trunk	Denied
PSTN Trunk	To foreign Area	All Devices	Denied

The following features are a must for logical partitioning of a PBX:

1. The subscriber of the system should not be able to transfer a call from the public line to private line and vice versa.

2. The subscriber should not be able to setup a conference call between the public line and private line.

3. The transfer of call from public line to public line is allowed.

4. The conference call between 2 external parties connected on public line only is allowed.

5. The transfer of call from private line to private line is allowed.

6. The conference call between 2 external parties connected on private line only is allowed.

OpenScape 4000 support only 1, 3 and 5 of the requirement of logical partitioning can be configured in the OpenScape 4000 systems.

Conference

Authorisation can be given to accept CO trunk connections in a conference by COT parameter XFER. This does not solve the requirements as this forbids or accepts to connect a CO trunk call to a conference independently of the other members' trunk types.

- Realisation

  Additional checks are made before creating a conference --- either after consultation or after accepting a second call --- or allowing a new member to join an existing conference, in order to filter out the different trunk type categories: i.e. CO trunks and private trunks. Mixing is prohibited.

  ACLC: If the patches of the CR is activated on a switch the ACLC Conference Call Request is also working according to the requested functionality of this CR.
- Prerequisites

  None. The solution filters out the conferences with mixed trunk type from the otherways acceptable ones.
- User interface

  The user attempting to initiate a mixed trunk type conference will have the usual "CONFERENCE NOT POSSIBLE" display message and stays in connection with the active party.

Call transfer

The requirements concerning the connection of the internal trunks and public trunks via call transfer can be solved by configuration using AMO KNMAT.

Administration (configuration example):

Configuring OpenScape 4000 system 1 in order to prohibit the call transfer from OpenScape 4000 system 2 to the public line:

In the tests the situation was as follows:

- Node number of OpenScape 4000 2 is 1-2-99
- Node number of the public network is 1-2-100
- The LEVEL is 0: we compare the values 99 and 100

```
CHA-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNO=99,DNNO=100,CONN=D;
```

Activation

```
CHANGE-ZAND:RESERVE,173,YES;
```

Configuration:

The Node Numbers of prohibited connections are configured in AMO-KNMAT as denied (CONN=D).They have to be configured for both directions in all systems of the network.

Example:

Connections between Node 100 and 200 are prohibited:

```
CHANGE-KNMAT:LEVEL=0,ONNO=200,DNNO=100,CONN=D;
 CHANGE-KNMAT:LEVEL=0,ONNO=100,DNNO=200,CONN=D;
```

For conference restrictions COT parameter NOHO has to be set for all NW trunks.

The following COT parameters have to be set in the network between different areas to prevent workarounds e.g. directed call pick up: CTLN & NQNP & NQPI.

NOTICE: Don't use these parameters within the Network: DSDL & LWNC & LRPM & ORRN & DFNN & NOCI & NOCT. Use Parameter LWNC and DFNN with caution! Don't use them within

the network! Use this parameters only to separate the network behind, e.g. to VoIP Network! Configure group features only within an area, e.g. Pick Up Group, Hunt Group, etc.

Restrictions:

Regarding AMO-KNMAT configurations are only possible per Level; it is only realized and tested in Level 0!

No Node Number differences in Higher Levels are allowed.

For outgoing connections only the node number of AMO-RICHT is used! - Node numbers of AMO-LDAT are ignored.

If a mobile User is logged in at a foreign area, follow me will not work for CO calls, regarding a connection to the foreign Area is not allowed. If it is necessary that CO calls shall follow the mobile user, it is recommended to use remote call forwarding feature to activate CFU via CO to the number of the physical device.

Use Group features, e.g. Pick Up Group, Hunt Group, within an area only.

2.10 Optional Patches

2.10.1 General

Optional patches are used to activate features or special functions for certain users. The activiation is now done by activation flags. These activation flags which are assigned to one or more specific patches can now be set or deleted using an AMO. The functions/features assigned to flags can thus be activated or deactivated.

2.10.2 Advantages

When updating a customer system from an old to a new release, all previously activated features are automatically activated in the new release after database update by means of the default customer database update using the standard update.

2.10.3 Procedure

The AMO PATCH will be used to set the relevant activation flags. The corresponding patches (one or more per flag) are then automatically copied from the ":PDS:OPT/" directory to ":PDS:PATCHINPUT/" and activated. The patches can be displayed in Patch Administration with DIS-PATCH and have the activation flag as group code.

Activation

- SWU
  `ACT-PATCH:OPT,S,flag;`

- ADP
  `ACT-PATCH:OPT,D,flag;`

Deactivation

To deactivate a feature activated in this manner, the commands

`DEACT-PATCH:OPT, ...`

etc. are used.

The associated patches are deactivated and deleted from Patch Administration. They remain, however, in :PDS:OPT/.

IMPORTANT: These patches cannot be activated and deactivated directly by specifying the patch name. After successful activation / deactivation you have to execute an EXEC-UPDAT (note: the AMO PATCH also comes up with this hint).

2.10.4 Overview of the Assigned Flags

- An overview of all integrated features available with a release and the corresponding activation flags can be found in the KMOSS PRB database under "Type of Correction".
- An overview of all integrated features available in a revision level and the corresponding activation flags can be found in the KMOSS PRB database under "Revision Level" or alternatively using the "FindIt" tool.
- An overview of all patches that have been assigned an activation flag can be found using the "FindIt" tool.

2.11 Partial Digit Analysis TWABE

Partial digit analysis (AMO TWABE) is used to pre-evaluate dialled digits in the device handler. Entries in the TWABE tables can be made for all possible digit combinations throughout the network. The TWABE tables, unlike the DPLN, do not take the call progress situations into account. In the case of short digit combinations contained in longer digit combinations, only the shortest possible combination must be entered in the TWABE tables, since both combinations may lead to different DARs in the dial plan.

E.g.	DPLN group 1	430	DAR = X
	DPLN group 2	43	DAR = Y

In the above example, if the digit combination 430 were to be entered in the TWABE tables, the shorter combination 43 would not be passed on to the DPLN.

When entering digit combinations in the TWABE tables, the digit combination to be evaluated is entered first (max. 3 digits), followed by the number of digits (up to 18) which must be dialled before the number is passed on to the DPLN for evaluation. Add digit combination 456 with a length of 6 digits, i.e. all digit

sequences which begin with 456 are not passed on to the DPLN for evaluation until the 6th digit has been dialled.
`ADD-TWABE:STNO=456,LEN=6;`

2.12 Power Fail Interrupt Settings

Starting with the Atlantik platforms (for example, 600ECX/600ECS, 80CMX-DSC, 80CXE systems), the software supports a battery manager (with power fail interrupt).

If the entire system power supply (line-powered converter plus any redundant units) fails, there is a switchover (hardware) to a battery, if there is one. If the battery capacity then also nears its limit, a so-called power fail interrupt (PFI) is generated approximately 1 minute before the end of the battery capacity. As a result of this PFI interrupt, the error message BATTERY DOWN is signaled and the UNIX operating system is informed so that critical data can be saved on the hard disk or so that the UNIX operating system can be brought down.

The software cannot detect on its own whether the hardware generates a PFI. Therefore it retrieves this information from a variable that you must set with the AMO FUNCT.

The call is as follows: 'CHANGE-FUNCT:PFI=WITHPFI;' (PFI can be evaluated) or 'CHANGE-FUNCT:PFI=WOUTPFI;' (PFI cannot be evaluated).

You can also set the power supply devices that you use with 'CHANGE-FUNCT' in the POWERSYS parameter.

You can assign the POWERSYS parameter the following values:

ACDCWR .... AC/DC system with power supply unit redundancy

ACDCWOR .... AC/DC system without power supply unit redundancy

DCDCWR .... DC/DC system with power supply unit redundancy

DCDCWOR .... DC/DC system without power supply unit redundancy

The call is as follows: 'CHANGE-FUNCT:POWERSYS=ACDCWR;'

If you have specified a redundancy in an AC/DC system, for example, and a power supply unit fails, POW FAIL REDUND LOSS AC/DC SYS is signaled and a minor alarm set. If you put the power supply unit back Into operation, POW FAIL REDUND BACK AC/DC SYS is signaled and the mInor alarm is cancelled.

If you have specified a redundancy in an AC/DC system, for example, and more than one power supply unit fails, POW FAIL START AC/DC SYS is signaled and a major alarm is set. In addition, the system switches over to a battery is there is one. If you put the power supply units back into operation, POW FAIL END AC/DC SYS is signaled and the major alarm is cancelled.

If you have not specified redundancy in an AC/DC system, for example, and one power supply unit fails, POW FAIL START AC/DC SYS is signaled and a major alarm is set. In addition, the system switches over to a battery if there is one. If you put the power supply unit back into operation, POW FAIL END AC/DC SYS is signaled and the major alarm is cancelled.

You can check the current PFI setting with the call `DISPLAY-FUNCT;`.

2.13 Routes

Trunk groups are assigned to outgoing routes with the AMO RICHT. These routes are allocated on or more access codes. The sequence in which the trunk groups are entered in the ADD-RICHT command also determines the seizure priorities, and thus also decides the overflow and alternate routing procedures.

A trunk group may be assigned to several routes. For this reason, the route parameters are specified separately for each trunk group in the AMO RICHT. However, a trunk may only be assigned to one trunk group!

2.13.1 Assign a route to the Telecommunications Service

- Assign the route codes in the DPLN

  The same codes are used as for the route to the Voice Mail Server.
  `AD-WABE:CD=key-num,DAR=VMOWN,CD2=key-num;`

  CD = route via DAR 'VMOWN' CD2 = route via DAR 'VMFOR'
- Add trunk group
  `AD-BUEND:NO=number;`

  (NO = number of trunks times 2)
- Assign a line circuit on an SLMD for TTX
  `AD-TSCSU:COTNO=number,TGRP=number,DEV=SMTTX;`
- Assign a line circuit on an SLMD for FAX
  `AD-TSCSU:COTNO=number,TGRP=number,DEV=SMFAX;`
- Assign a route
  `AD-RICHT:TYPE=CD,CD=key-num,SVC=TTX,SM=VM,TGRP1=number;`

  `AD-RICHT:TYPE=CD,CD=key-num,SVC=FAX,SM=VM,TGRP1=number;`

  A separate route must be assigned for each service using different trunk groups.

2.13.2 Assign a Route to the Voice Mail Service

- Add the codes in the DPLN
  `AD-WABE:CD=key-num,DAR=VMOWN,CD2=key-num;`

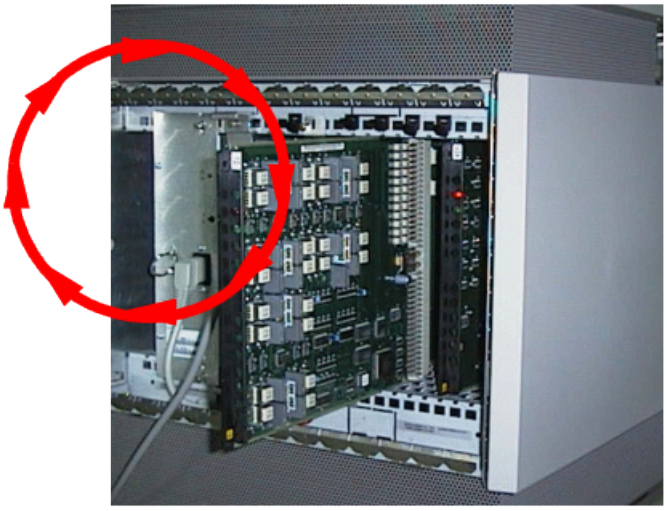
  CD = route via DAR 'VMOWN' CD2 = route via DAR 'VMFOR'
- Add trunk group
  `AD-BUEND:NO=number; (NO = number of trunks times 2)`
- Assign a line circuit on an SLMD
  `AD-TSCSU:COTNO=number,TGRP=number,DEV=SMVM;`
- Assign a route
  `AD-RICHT:TYPE=CD,CD=key-num,SVC=VCE,SM=VM,TGRP1=number;`
- Delete a route
  `DEL-RICHT:TYPE=CD,CD=key-num,SVC=param,TYPE=TGRP,TGRP=number;`
- Delete the trunk group
  `DEL-BUEND:TGRP=number;`

2.13.3 LCR Routes

See Chapter 36, "LCR (Least Cost Routing)"!

2.14 Recovery of Peripheral Units

2.14.1 Feature Description



- Up tp 8 automatic recoveries of peripheral units.
- Pre-initialised timer values for automatic recovery.
- Different recovery times for LTUC, board, trunk and terminal.
- Monitoring of the peripheral units for stable operation.
- Timer can be configured for all functions.

Using this feature, defective peripheral units can be restarted once or, if necessary, several times (LTUC, boards, trunks and terminals).

After a defect the corresponding device is locked for a certain period of time (LOCKTIM). It is then restarted and monitored for stable operation (STABTIM). If all restart attempts fail, the device remains in defect state.

2.14.2 Feature Characteristics

- Possibilities:

  As default, up to 5 recoveries can be executed. Using PSTAT AMO, between one and up to eight restarts for the levels LTUC, boards, trunks and terminals can be selected. The time until recovery (lock time), and the monitoring time until stabilization, can be modified.

2.14.3 User Interface: AMO PSTAT

- Query of the locking times: all locking times for the levels LTUC, boards, trunks and terminals are displayed (INIT and ACTUAL)
- Query of the stabilization times: one stabilization time per level LTUC, boards, trunks and terminals is displayed (INIT and ACTUAL)
- Modification of the locking times: the locking times can be modified for every level. The values are between 0 and 60 minutes. At least one locking time must be >0. The locking times must be selected in ascending order. The reason being, that it makes sense to increase the locking times with every recovery. The first three locking times should be under 10 minutes for a speedy recovery of the unit and to avoid alarm messages to the Service Center (see also the section on Service Information). A locking time of 1 minute could be too short which would result in a second recovery. After the modification the original time is stored as INIT value.
- Modification of the stabilization times: these times can be modified on every level. The values are between 10 and 30 minutes. Regeneration of the locking times: this is executed in case of deviations between the INIT and the ACTUAL values. Regeneration of the stabilization times: this is executed in case of deviations between the INIT and the ACTUAL values.
- Application areas: no restriction

2.14.4 Service Information

- The delay time before alarm messages are sent to the Service Center is 10 minutes. If a locking time exceeds the 10 minute threshold and a renewed defect exceeds the alarm threshold set for a group of devices, an alarm could be released.
- Instead of individual timers a central timer is used per device to set the locking and stabilizing times. The times are therefore subject to deviations of up to 60 seconds. A locking time of 1 minute could therefore lie between 0 and 60 seconds, a locking time of 2 minutes could lie between 60 and 120 seconds.
- Restrictions: For technical reasons, certain modules are excempt from the recovery: RGEN, WGEN, PSIO, CONF and the central SIU.
- If all timers are set to the maximum value the recovery could last for up to 5 and a half hours.

2.14.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
PSTAT	LOCKTIM	d	Sperrzeit vor Wiederinbetriebnahme
	LOCKTIM	e	Locking time before recovery
	STABTIM	d	Überwachungszeit nach der Inbetriebnahme

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	STABTIM	e	Stabilization time after automatic recovery

2.14.6 Generation Information

The locking time (LOCKTIM) and stabilization time (STABTIM) tables receive their contents from the database during startup. The INIT and ACTUAL times have the same values.

The PSTAT AMO can be used to query, modify and regenerate the ACTUAL times.

Query of the locking times

```
DIS-PSTAT:TYPE=LOCKTIM;
```

Comment:

The values described under "INIT" represent the initializing values. This shows the deviations from the basic initialization value and the current value. The value 0 under e.g. TIM6 means that this timer is inactive.

```
H500:  AMO PSTAT STARTED
 +-------------------------------------------------------------------
+

|  LOCKING TIMES (IN MINUTES)
             |

|  OF THE AUTOMATIC  RECOVERY
             |

+---------------
+-----------------------------------------------------+

| LEVEL          | TIM1 | TIM2 | TIM3 | TIM4 | TIM5 | TIM6 |
 TIM7 | TIM8 |

+---------------+------+------+------+------+------+------
+------+------+

| BOARD  ACTUAL |   2  |   5  |   9  |  20  |  60  |   0  |
   0  |   0  |

|        INIT   |   2  |   5  |   9  |  20  |  60  |   0  |
   0  |   0  |

+---------------+------+------+------+------+------+------
+------+------+

| CIR    ACTUAL |   2  |   5  |   9  |  20  |  60  |   0  |
   0  |   0  |
```

```
|        INIT   |   2  |   5  |   9  |  20  |  60  |   0  |
   0  |   0  |

+---------------+------+------+------+------+------+------
+------+------+

| DEV    ACTUAL |   2  |   5  |   9  |  20  |  60  |   0  |
   0  |   0  |

|        INIT   |   2  |   5  |   9  |  20  |  60  |   0  |
   0  |   0  |

+---------------+------+------+------+------+------+------
+------+------+

| LTUC   ACTUAL |   2  |   5  |   9  |  20  |  60  |   0  |
   0  |   0  |

|        INIT   |   2  |   5  |   9  |  20  |  60  |   0  |
   0  |   0  |

+---------------+------+------+------+------+------+------
+------+------+

AMO-PSTAT-153       PERIPHERAL STATISTICS
```

Modification of the locking times, e.g. for boards:

```
CHA-PSTAT:LOCKTIM,BOARD,2,4,8,16,30,60,60,60;

H500:  AMO PSTAT STARTED

H06: BY INCREASING THE LOCKING TIME TO A VALUE >= 10
 MINUTES

     THE ALARM ASSIGNED TO THIS BOARD CAN BE ACTIVATED.

AMO-PSTAT-153       PERIPHERAL STATISTICS
```

Modification of the locking times e.g. for terminals:

```
CHA-PSTAT:LOCKTIM,DEV,1,3,5,9,0;

H500:  AMO PSTAT STARTED

AMO-PSTAT-153       PERIPHERAL STATISTICS
```

Query of the stabilizing times

```
DIS-PSTAT:TYPE=STABTIM;
```

Comment:

The values described under "INIT" represent the initializing values. This shows the deviations from the basic initialization value and the current value.

```
+----------------------------------------+
```

```
|  STABILIZING TIME (IN MINUTES)            |
|  OF THE AUTOMATIC  RECOVERY               |
+-------------+-------------+--------------+
|  LEVEL      |     INIT    |    AKTUALL   |
+-------------+-------------+--------------+
|  BOARD      |      20     |      20      |
+-------------+-------------+--------------+
|  CIR        |      20     |      20      |
+-------------+-------------+--------------+
|  DEV        |      20     |      20      |
+-------------+-------------+--------------+
|  LTUC       |      20     |      20      |
+-------------+-------------+--------------+
AMO-PSTAT-153       PERIPHERAL STATISTICS
```

Modification of the stabilizing time, e.g. for trunks:

```
CHA-PSTAT:STABTIM,CIR,10;
 H500:  AMO PSTAT STARTED
```

2.15 Subscriber Search Enhancements

2.15.1 Feature Description

For searching for stations in a specific source group and/or in a specific cluster branches are available in AMO SDAT.

Furthermore, a branch is implemented on AMO SBCSU for querying the stations with a specific IP address and listing stations in a specific network. It is possible for the user to enter the IP address and get the station number that owns this address. It is also possible to list all stations that are in a network by entering a partial IP address.

2.15.2 Generation (Example)

Search for stations in a specific source group

```
DISPLAY-SDAT:TYPE=SRCFIND,SRCGRP=<xy>;
```

Output:

```
DISP-SDAT:TYPE=SRCFIND,SRCGRP=5;
 H500:  AMO SDAT  STARTED

STNO  =          105  SRCGRP = 5

STNO  =          106  SRCGRP = 5

STNO  =          107  SRCGRP = 5

STNO  =          108  SRCGRP = 5

STNO  =          233  SRCGRP = 5



AMO-SDAT -111       ADMINISTRATION OF SUBSCRIBER ATTRIBUTES
 AND
DATA

DISPLAY COMPLETED;

  <
```

Search for stations in a specific cluster

```
DISPLAY-SDAT:TYPE=CLUSFIND,CLUSTID=<xy>;
```

Output:

```
DISP-SDAT:TYPE=CLUSFIND,CLUSTID=5;
 H500:  AMO SDAT  STARTED

STNO  =          105  CLUSTID = 5

STNO  =          106  CLUSTID = 5

STNO  =          107  CLUSTID = 5

STNO  =          108  CLUSTID = 5

STNO  =          233  CLUSTID = 5



AMO-SDAT -111       ADMINISTRATION OF SUBSCRIBER ATTRIBUTES
 AND
DATA

DISPLAY COMPLETED;

  <
```

Search for a station with a specific IP address

```
DISPLAY-SBCSU:TYPE=IPSEARCH,IPADDR=192.168.10.20;
```

Output:

```
DISP-SBCSU:TYPE=IPSEARCH,IPADDR=192.168.10.20;
 H500:  AMO SBCSU  STARTED

STNO  =          105  IPADDR = 192.168.10.20



AMO-SBCSU -111       STATION AND S0-BUS CONFIGURATION OF
SWITCHING UNIT

DISPLAY COMPLETED;
   <
```

Search for stations in a specific network

```
DISPLAY-SBCSU:TYPE=IPSEARCH,IPADDR=192.168.2.*;
```

The user can enter an asterisk (*) for each number. It will then be possible to specify network IPADDR as

- *.*.*.*
- X.*.*.*
- X.Y.*.*
- X.Y.Z.*

Output:

```
DISP-SBCSU:TYPE=IPSEARCH,IPADDR=192.168.2.*;
H500:  AMO SBCSU  STARTED

STNO  =          105  IPADDR=192.168.2.10

STNO  =          106  IPADDR=192.168.2.5

STNO  =          107  IPADDR=192.168.2.29

STNO  =          108  IPADDR=192.168.2.7

STNO  =          233  IPADDR=192.168.2.46



AMO-SBCSU -111       STATION AND S0-BUS CONFIGURATION OF
SWITCHING UNIT

DISPLAY COMPLETED;

  <
```

2.15.3 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
SDAT	TYP=SRCSUCH	d	Suche nach Teilnehmern in einer bestimmten Source Group
	TYPE=SRCFIND	e	Search for stations in a specific source group
	TYP=CLUSSUCH	d	Suche nach Teilnehmern in einem bestimmten Cluster
	TYPE=CLUSFIND	e	Search for stations in a specific cluster

2.16 System Backup & Restore

2.16.1 Important Information

IMPORTANT: For a Duplex or Separated Duplex system the function "Recovery HD" can't be used in case only one node is down even if this is node A.

2.16.2 Scenarios

The following use cases exist:

1) Recovery of Duplex system due to hardware problems

a) Both nodes of a Duplex deployment are down due to problems with the cluster:

- Shut down the system from OpenScape 4000 Platform Administration (Portal) (**OpenScape 4000 Platform Administration (Portal) > Maintenance > Shutdown/Reboot >** select option **Shutdown**) or if OpenScape 4000 Platform Administration (Portal) is not available make a shutdown via ssh connection on all nodes (e.g. `shutdown -h now` or `init0`).
- Remove all hard disks from Drive1 slot (node 1).
- Insert the recovery hard disk. Please refer to the online help of OpenScape 4000 Platform Administration (Portal) how to create a Recovery HD.
- Remove the HA (corosync) and Atlantic cable between the nodes.
- Switch on node 1. The system boots using the software version stored on the recovery hard disk.
- Telephony will be restored immediately. All resources will start. CCA will reach active state in approximately 3 minutes. Telephony will be usable again in 5 to 10 minutes (depending on the system size).

- Reinstall using the first installation image on node 1 (with the same version the recovery HD has) using as deployment Duplex Replacement. If a xml file is used than node configuration for this board in slot5 should contain data that it is a replacement board. <entry key="node-replacement">1</entry>
- After installation and configuration is done on node 2 connect the HA (corosync) and Atlantic cable between the two boards.
- OpenScape 4000 Assistant image, OpenScape 4000 Assistant data, OpenScape 4000 CSTA image and OpenScape 4000 Platform Administration data will be provided to node 2 via DRBD and remote copy from node 1 automatically.
- To recover the latest data (from the time the Recovery HD was created until last Data/Logical Backup was done) use the **OpenScape 4000 Backup & Restore > Data/Logical Restore**.

  Please refer to the online help of OpenScape 4000 Backup & Restore for more information.

b) One of the nodes of a Duplex deployment is down due to problems with the cluster:

If one node is down then reinstall using the first installation image (with the same version the other nodes have) with the right configuration (replacement board) .

If a xml file is used than node configuration should contain data that it is a board replacement.

<entry key="node-replacement">1</entry>

c) Board replacement (hardware has crashed / Linux does not boot anymore / the whole board must be replaced).

To recover the board use the first installation image (image version should be the same as on the other node) and a xml file containing system configuration. xml node configuration should contain data that it is a board replacement.

<entry key="node-replacement">1</entry>

OpenScape 4000 Assistant image, OpenScape 4000 Assistant data, OpenScape 4000 CSTA image and OpenScape 4000 Platform Administration data will be provided to new board via DRBD and remote copy from the other node (only possible for Duplex and Separated Duplex deployments).

d) Board recovery in case of SOCO2/DRBD problems but Linux is still working (problems with the cluster - only possible for Duplex and Separated Duplex deployments).

To recover the board use the first installation image (image version should be the same as on the other node/nodes) and a xml file containing system configuration. xml node configuration should contain data that it is a board replacement.

<entry key="node-replacement">1</entry>

In the future: Script based recovery

2) Recovery of Simplex / Survivable SoftGate

- To recover the system use the latest Recovery HD.

  Please refer to the online help of OpenScape 4000 Platform Administration (Portal) how to create a Recovery HD.
- To recover the latest data (from the time the Recovery HD was created until last Data/Logical Backup was done) use the **OpenScape 4000 Backup & Restore > Data/Logical Restore**.

  Please refer to the online help of OpenScape 4000 Backup & Restore for more information.

3) Recovery of Separated Duplex

a) All three nodes of a Separated Duplex deployment are down due to problems with the cluster.

- Shut down the system from OpenScape 4000 Platform Administration (Portal)(**OpenScape 4000 Platform Administration (Portal) > Maintenance > Shutdown/Reboot >** select option **Shutdown**) or if OpenScape 4000 Platform Administration (Portal) is not available make a shutdown via ssh connection on all nodes (e.g. `shutdown -h now` or `init0`).
- Remove all hard disks from Drive1 slot (node 1).
- Insert the recovery hard disk.

  Please refer to the online help of OpenScape 4000 Platform Administration (Portal) how to create a Recovery HD.
- Remove the HA (corosync) and Atlantic cable from all nodes except node 1.
- Switch on node 1.
- The system boots using the software version of the recovery hard disk.
- To restore the telephony immediately using only one node enter the following command in a Linux console from node 1:

  ```
  standalone_operation enable
  ```

  All resources will start, CCA will reach active state in approximately 3 minutes. Telephony will be usable again in 5 to 10 minutes (depending on the system size).
- Reinstall using the first installation image (with the same version that the recovery HD has) on the other nodes of the system (node 2 and Quorum) with the right configuration.

  If a xml file is used than the node configuration should contain data that it is a board replacement.

  ```
  <entry key="node-replacement">1</entry>
  ```
- After all configuration is redone connect the HA (corosync) and Atlantic cable for all existing nodes of the system.
- At this point it is mandatory to disable standalone mode. To do this use following command in a Linux console from node 1:

  ```
  standalone_operation disable
  ```
- OpenScape 4000 Assistant image, OpenScape 4000 Assistant data, OpenScape 4000 CSTA image and OpenScape 4000 Platform Administration data will be provided to node 2 via DRBD and remote copy from node 1.

- To recover the latest data (from the time the Recovery HD was created until last Data/Logical Backup was done) use the **OpenScape 4000 Backup & Restore > Data/Logical Restore**.

  Please refer to the online help of OpenScape 4000 Backup & Restore for more information.

b) One node of a Separated Duplex deployment is down due to problems with the cluster.

If one node is down then reinstall using the first installation image (with same version the other nodes have) with the right configuration (board replacement).

If a xml file is used than node configuration should contain data that it is a board replacement.

<entry key="node-replacement">1</entry>

c) node 1 and node 2 of a Separated Duplex deployment are down due to problems with the cluster.

Follow the steps described in All three nodes of a Separated Duplex deployment are down due to problems with the cluster.

d) node 1 and Quorum or node 2 & Quorum of a Separated Duplex deployment are down.

If node 1 and Quorum or node 2 and Quorum are down then:

- Shut down the nodes that are not working (**OpenScape 4000 Platform Administration (Portal) > Maintenance > Shutdown/ Reboot >** select option **Shutdown**).
- To restore the telephony immediately using only one node the following command in a Linux console on the remaining node:

  ```
  standalone_operation enable
  ```

  All resources will start. CCA will reach active state in approximately 3 minutes. Telephony will be usable again in 5 to 10 minutes (depending on the system size).
- Reinstall using the first installation image (with the same version the remaining node has) on the other nodes of the system with the right configuration.

  If a xml file is used than the node configuration should contain data that it is a board replacement.

  ```
  <entry key="node-replacement">1</entry>
  ```
- At this point it is mandatory to disable standalone mode. To do this use following command in a Linux console from node 1:

  ```
  standalone_operation disable
  ```
- OpenScape 4000 Assistant image, OpenScape 4000 Assistant data, OpenScape 4000 CSTA image and OpenScape 4000 Platform Administration data will be provided to the other node via DRBD and remote copy.

4) Recovery of Access Point Emergency, RG 8300, OpenScape Access, Survivable SoftGate.

For these deployments no HD Recovery is possible.

- To recover these systems use the first installation image (firstinst-netw.sh) and a xml file containg the system configuration.
- To recover the data use the OpenScape 4000 Assistant Backup & Restore > APE Restore.

  Please refer to the online help of OpenScape 4000 Backup & Restore for more information.

5) Recovery of OpenScape Access/RG 8350a and OpenScape Access/Survivable SofGate (no HD Recovery possible on this hardware deployments)

- To recover these systems use the first installation image (firstinst-netw.sh) and a xml file containing the system configuration.
- To recover the data use the OpenScape 4000 Assistant Backup & Restore. The backup server must be outside the system because the OpenScape 4000 host system isn't working also.

  Please refer to the online help of OpenScape 4000 Backup & Restore for more information.

6) Recovery of SoftGate Standalone

- To recover these systems use the first installation image (image version should be the same as the one from the Host system) and a xml file containg the system configuration.
- Loadware update of the gateways
- HG 3550 M Auto-Restore

  With the Web Based Management of the board the externally stored configuration data can be loaded to the gateway.

  WBM > Maintenance > Configuration > Configuration Data > (right-click) **Load to Gateway > Loading via HTTP**

  In the **Backup/Restore** menu of the Web Based Management, you can backup (export) the vHG 3500 HFA configuration data and the security configuration locally. This local backup can be loaded (imported) and activated.

  WBM > Maintenance > Backup/Restore > Import Config

  Please refer to the online help of the WBM for more information.

7) Recovery of SoftGate in case that the OpenScape 4000 SoftGate doesn't startup anymore, but Linux is still ok.

To recover these systems use the first installation image (image version should be the same as the one from the Host system) and a xml file containing the system configuration. The whole Linux must be reinstalled even if it's ok.

In the future: new feature to Re-InstallSoftGate-RPM triggered by Web Based Management.

2.17 Timers

There are numerous timers in the system all of which are initialized. The majority of these timers can be changed by administration and maintenance. In

view of the large number of timers, it was necessary to divide them up between several AMOs.

- The AMO CTIME changes the call processing timers.
  AE-CTIME:ARTSWU=

- CP	General timers for call processing part 1
- CP2	General timers for call processing part 2
- TRK	Timers for trunk circuits
- ATND	Timers of the attendant terminals
- CCM	Timers for multiple code calling equipment
- VECOTIME	VECO timers

- AMO DTIM1 changes the timers for the device handler.
  AE-DTIM1:ARTDH=

- DIGITE	Timers for Digite
- CO	Timers for trunk calls
- TIE	Timers for tie traffic
- STN	Timers for stations
- ALTA	Timers for branch circuits for Austria
- MTLC	Timers for main system tie line circuits
- TCOM	Timers for adapters for special equipment
- MFCDID	Timers for DTMF DID and test program
- EXPTONE	Timers for expensive tone

- AMO DTIM2 also changes the timers for the device handler
  AE-DTIM2:ARTDH=

- LNGBN	Timers for line circuits, general
- MKBK	Make/break ratios for CO and tie-line circuits
- GEN	General timers
- DSS1	call back on dss1 protocol

- AMO PTIME changes the timers of the periphery.
  AE-PTIME:ARTEE=

- SLMA	subscriber line module analog resp. analog devices
- SLMA1	subscriber line module analog individual
- REST	all other device types

3 OpenScape 4000 Assistant

3.1 Account Management

With the account management of the HiPath 4000 Assistant the following functions are possible:

Change the Password of an Account

To change the password of an account logon via SecM (a so-called ASbum account). But you can also use the following command:
`# /opt/bum/bin/bum_passwd account new_password`

account	name of the account
new_password	enter the new password

IMPORTANT: It is recommended to surround "new_password" by single or double quotes to avoid the shell being confused by some special characters.

Automatically Lock an Account after Several Wrong Password Inputs
`# /opt/bum/bin/bum_passwd -l account`

-l	lock an account
account	name of the account

Unlock an account
`# /opt/bum/bin/bum_passwd -u account`

-u	unlock an account
account	name of the account

Force an user to change the password with next login
`# /opt/bum/bin/bum_passwd -f account`

-f	force the user to change the password with next login
account	name of the account

Delete the password of an account
`# /opt/bum/bin/bum_passwd -d account`

-d	delete the password of an account ("-f" is implied in this option)
account	name of the account

An OS account that is attached to an ASbum account is adjusted automatically by bum_passwd.

4 IP Solutions

You can find a complete description of the following features in the Service Manual OpenScape 4000, Section 4 - IP Solutions.

- Access Point Emergency (APE)
- Different Time Zones (DTZ)
- H323 / H323 Annex Connectivity
- HiPath Cordless IP
- HiPath Feature Access (HFA)
- Gateways HG 3500 and HG 3575
- IP Distributed Architecture (IPDA)
- IP Terminals
- Large Enterprise Gatekeeper (LEGK)
- Mobile HFA
- OpenScape Access, OpenScape Branch
- OpenScape 4000 SoftGate
- Payload Switching DMC
- RG 8350a
- Separate LAN Connectivity for Administration and VoIP
- Signaling and Payload Encryption (SPE)
- SIP Connectivity
- T.38 Fax

5 Networking

5.1 Basic Networking Principles

5.1.1 General Information

In this case, networking means interconnecting systems with different network structures, such as

- several OpenScape 4000/HiPath 4000 systems with another or with old systems via S0/S2 lines,

or

- virtual networking of several OpenScape 4000/HiPath 4000 systems with one another or with old systems via carrier.

Networking can use either closed or open numbering (see Chapter 36, "LCR (Least Cost Routing)").

Heterogeneous networking, which is networking with systems from other manufacturers, is also possible.

Note that in the case of network nodes without attendant console, you must configure one console group with a night switch option as "station". This does not require any hardware (see Chapter 153, "Attendant Console").

5.1.2 Network Structures

5.1.2.1 Meshed network, fully meshed

In this type of network, each system has a direct connection to every other system. Because of the large number of lines, this type of network is not useful in large networks.

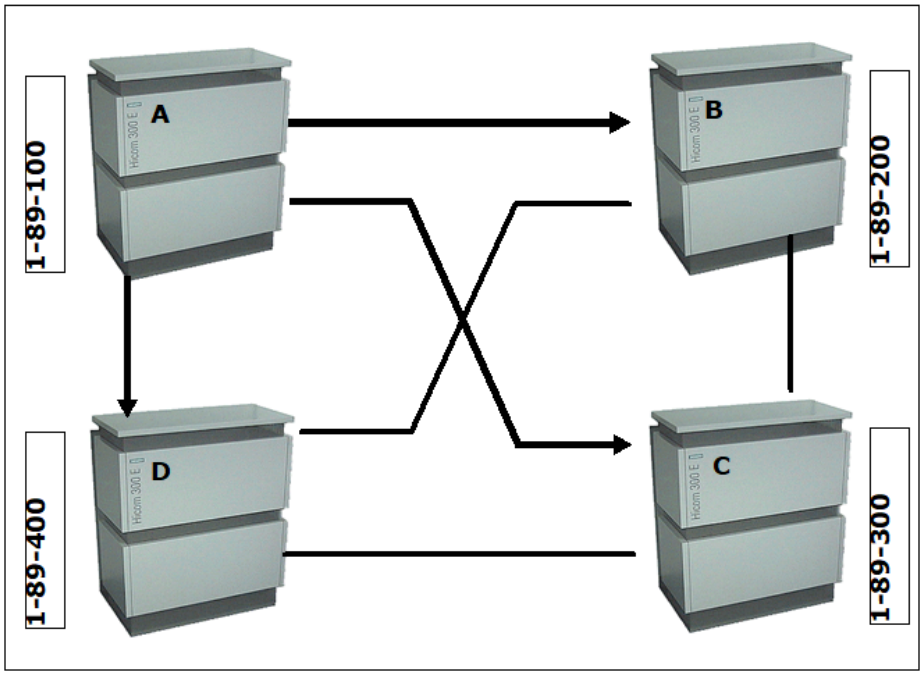


Figure 4: Meshed Network, Fully Meshed

5.1.2.2 Meshed network, partially meshed

In this type of network, only some systems have a direct connection to every other system.

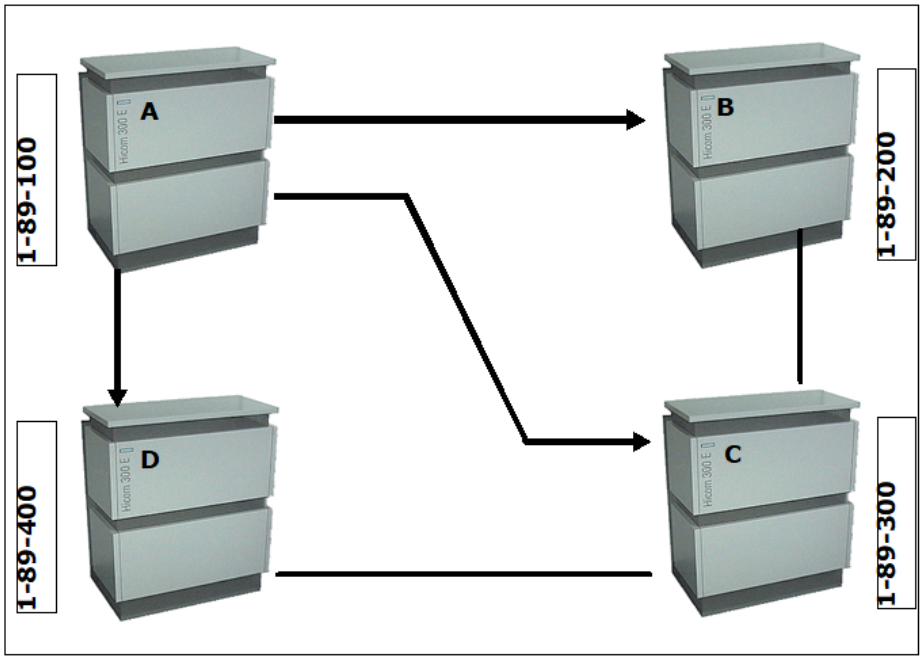


Figure 5: Meshed Network, Partially Meshed

5.1.2.3 Star-type network

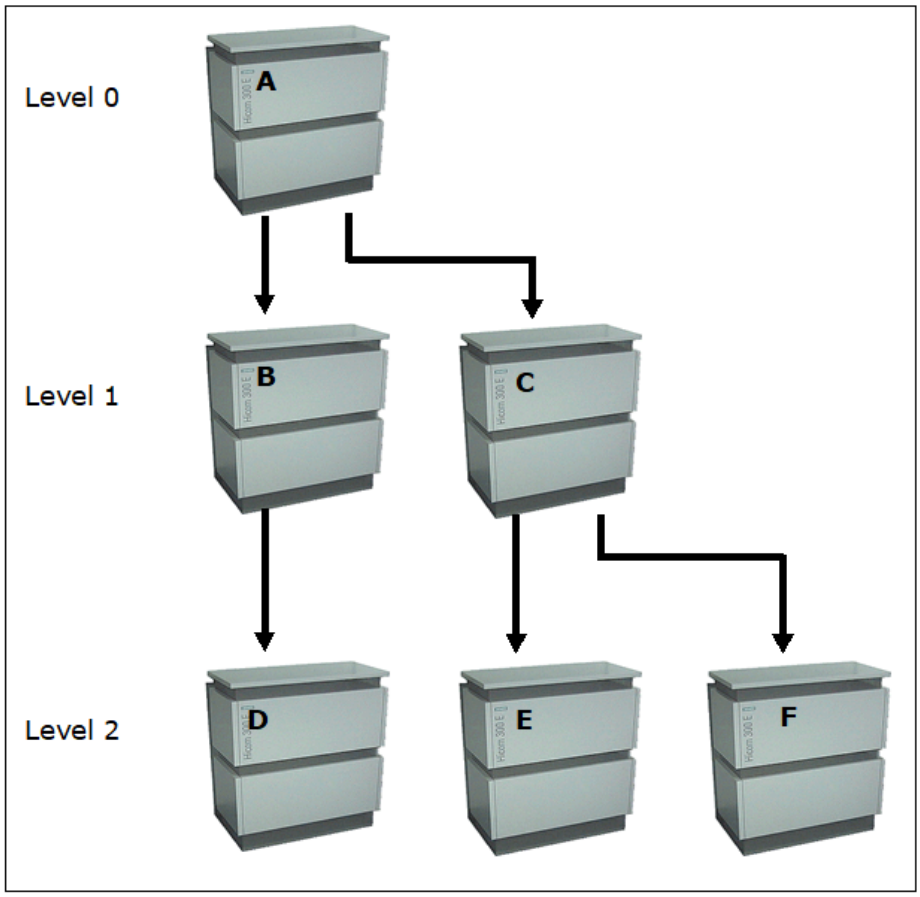


Figure 6: Star-Type Network (hierarchical)

5.1.3 Digit Analysis

Store all numbers and codes (route and service codes) of a node and the numbers and codes that should be available in other nodes in the digit analysis of each node. Route and service codes lead to the digit analysis result (DAR) "NETW" with the destination number (DESTNO) as additional information. Network-wide station numbers lead to the DAR "STN" and also indicate the DESTNO. For this reason, you must allocate one or more destination numbers (1 - 255), unambiguous throughout the network, to each node in a closed numbering network.

You must assign each node a physical node number (PNNO in AMO ZAND) that is unambiguous throughout the network. You must also assign at least one virtual node number (NNO in AMO KNDEF) in each network node. The destination number makes the connection between digit analysis and device search (AMO RICHT) and only has to be unambiguous within a node.

Sometimes CO providers may overlap and the DDI number (called number) with TON=SUBSCRIBER cannot be analysed definitively.

e.g. then the DDI number is called with 7222XXX. The call could be for a subscriber 2XXX in the virtual node 1-1-200 or for a subscriber 22XXX in the virtual node 1-1-201.

To solve this issue you must also assign the KNDEF node to the CO trunk with parameter VKNNR in TDCSU

VIRTUAL NODE NUMBER	TYPE	ISDN (E.164) CC AC LC SK
1- 1- 200	OWN	49 89 722 3
1- 1- 201	OWN	49 911 72 2

You must manage the central office code in the dial plan (DPLN) on digit analysis point CO or TIE (but not NETW!) if you want to use it to reach an external node.

In DAR pairs, select CHECK=N if you do not want the DAR partner to be treated at the same time. Then you must configure the necessary partner with another command. This improves the runtime.

IMPORTANT: The action REGEN only generates ADD command with CHECK=N.

The default value is CHECK=ALL. If the station number contains special characters and TEST=ALL is specified, then this either this is DAR without the "dial pulsing" property or you must specify the parameter CDDP and, for DAR pairs, the parameter CDDP2.

5.1.4 Station Numbers and Codes throughout the Network

5.1.4.1 Feature description

You store the entire station number household of a network in the DPLN of all nodes. With ADD WABE, you assign all network station numbers to the DAR=STA. With CHA WABE, you assign all node-external station numbers a DESTNO. If the nodes are not fully meshed, configure fictive routes with the destination number of the destination node over the transit node. This is done with a separate code to DAR "NETRTE" with the same trunk group that leads to the transit node, but with the destination number on which the station device is configured. This does not apply to the central office code in nodes without trunks.

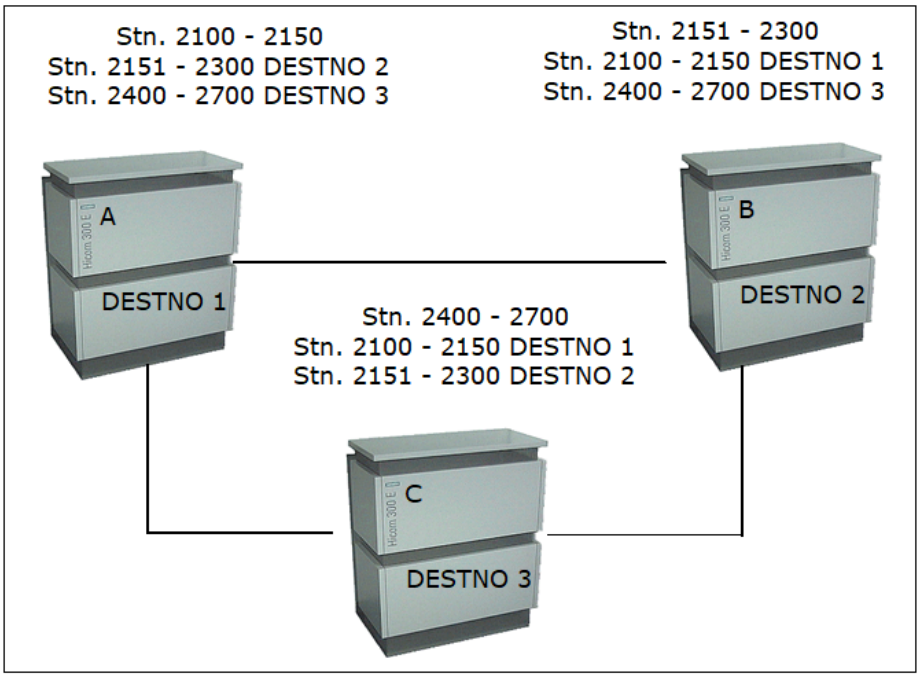


Figure 7: Network with 3 Nodes, Fully Meshed

You can also configure several routes between 2 nodes and these routes can be a mixture of analog and digital. You can assign a separate destination number to each route. If you have configured the route with the digit analysis result NETRTE, you determine the route that should be seized after this code is dialed by specifying the appropriate DESTNO.

5.1.4.2 Service information

IMPORTANT: If there are several destination numbers to a destination system, you must enter the correct destination number in the circuits of each of the routes with the AMO TDCSU.

5.1.4.3 Generation (example)

You assign the station numbers to the separate nodes as follows (see figure Network With 3 Nodes, Fully Meshed).

- Commands for node A:

```
ADD-WABE:CD=2100&&2300,DAR=STN;

ADD-WABE:CD=2400&&2700,DAR=STN;

Assign the DESTNO for nodes of external stations as
 follows:

CHA-WABE:CD=2151&&2300,DESTNO=2; (station in node B)
```

```
CHA-WABE:CD=2400&&2700,DESTNO=3; (station in node C)
```

- Commands for node B:

```
ADD-WABE:CD=2100&&2300,DAR=STN;

ADD-WABE:CD=2400&&2700,DAR=STN;

CHA-WABE:CD=2100&&2150,DESTNO=1; (station in node A)

CHA-WABE:CD=2400&&2700,DESTNO=3; (station in node C)
```

- Commands for node C:

```
ADD-WABE:CD=2100&&2300,DAR=STN;

ADD-WABE:CD=2400&&2700,DAR=STN;

CHA-WABE:CD=2100&&2150,DESTNO=1; (station in node A)

CHA-WABE:CD=2151&&2300,DESTNO=2; (station in node B)
```

The hunt group in node B (code = 83) should also be accessible from nodes A and C (fully meshed).

- Configure the code in node B as follows:

```
ADD-WABE:CD=83,DAR=HUNT;
```

- To ensure that the hunt group in node B is accessible from node A, you must enter the following command in node A:

```
ADD-WABE:CD=83,DAR=NETW,DESTNO=2;
```

- To ensure that the hunt group in node B is accessible from node C, you must enter the following command in node A:

```
ADD-WABE:CD=83,DAR=NETW,DESTNO=2;
```

IMPORTANT: If a hunt group moves to another node, you must delete the hunt group and the code and then add them to the new node. The only way to change DAR=HUNT to DAR=NETW is by deleting it and then adding it again.

5.1.4.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
WABE	RNR	d	Verzweigungsparameter
	CD	e	access code / station number
	KZP	d	Kennzahlpunkt
	DAR	e	Digit analysis result
	ZLNR	d	Zielnummer
	DESTNO	e	destination number

5.1.5 Physical and Virtual Node

The physical node defines the PABX, virtual nodes define groups of subscribers with the same numbering plan. Every subscriber and Attendant console must be assigned to a virtual node (by. AMO SDAT). Virtual nodes are managed with the AMO KNDEF. The numbering plan data for ISDN E.164/ PNP number plans and for the OpenScape 4000 implicit numbering plan can be defined for every node .Within a physical node at least one virtual node must be defined. However, this can also extend over several physical nodes, or several virtual nodes be within the same physical node.

A virtual node must be defined as a default node. The default node is used to enable a node number for phone numbers, e.g. attendant and attendant group code numbers which are not explicitly assigned to a virtual node..

The introduction of virtual nodes became necessary by the introduction of two new features:

- IPDA:

  Due to The subscribers of access points being assigned to different locations If e.g. an Access Point is in Berlin, a different one in Munich, then the participants in Munich shall be accessed under a Munich C.O. phone number and in Berlin under a Berlin C.O number, This is achieved by assigning the participants to two virtual nodes ,these both lie on the same physical node but have different E.164 numbering plan data.
- USA EPNP:

  U.S. American PABX's often have not one but several main office phone numbers.This means that the public number plan in the USA can often provide no more sufficient free direct dial numbers ranges in the required size . E.g. a business needs 1800 Direct Dial numbers, perhaps it must buy 2 3-digit direct dialling areas at 1000 numbers each and has therefore two E.164 Local destination codes. Moving a station in a private network

retaining the phone number (E.164/PNP/OpenScape 4000 Numbering plan)has to be possible.

The normal case is: A physical node has a virtual node.

Virtual nodes are, identified by the virtual node number, physical nodes by the physical node number.

Virtual nodes have a virtual node code for the OpenScape 4000 numbering plan and /or E.164 or PNP codes. physical nodes have a physical node code.

The following pictures show the normal configuration and the application case mentioned:

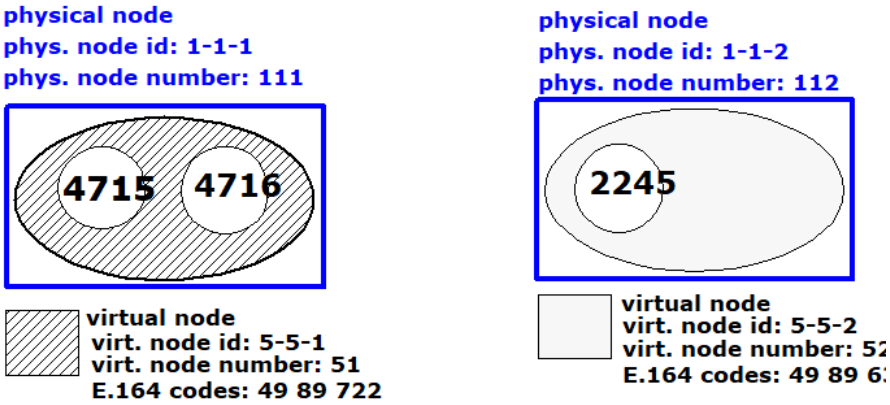


Figure 8: Normal configuration for 2 PABX's

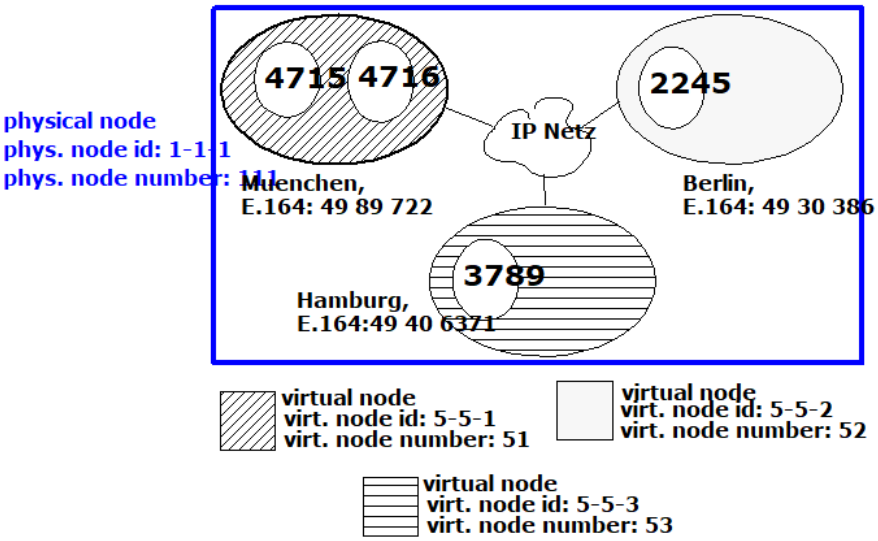


Figure 9: IPDA Configuration

Normal configuration after a move of stn 4716 taking with it the phone number and the E.164 number in the implicit OpenScape 4000 number plan (open numbering)

3 virtual nodes exist on a physical node.

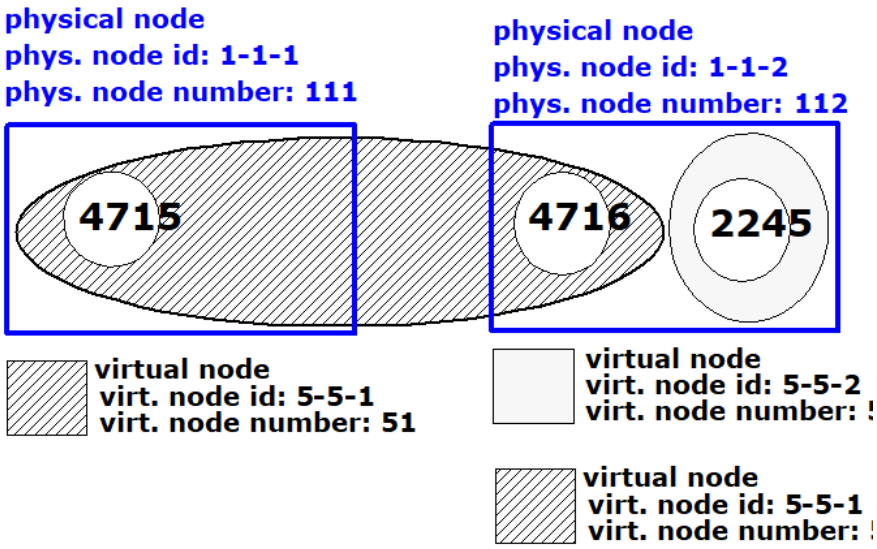


Figure 10: Normal configuration after a move of a station

The virtual node 5-5-1 has extended itself into the physical node 1-1-2 and is identicaly configured on both physical nodes.

5.1.6 Node Number

5.1.6.1 Feature Description

The node number serves administration and routing purposes. The numbers are allocated by the network configurator and must be unique network-wide. The Node number for a system is configured in every individual node with the AMO ZAND, Parameter **PNNO**. This applies to both open and closed numbering schemes. A distinction is made between a physical and virtual (fictitious) node numbers . For this function (LCR) an originating node number (ONNO) and an destination node number (DNNO) were defined. These always describe entry and end-points of a connection (not the transit nodes!)

Node number parameters are specified in the following AMOs:

ZAND, RICHT, KNMAT, TACSU, TDCSU, TSCSU, LDAT, KNFOR, WABE (display only), ACSU, KNDEF, KNLCR, KNTOP and SDAT.

5.1.6.2 Structure Overview

The node numbers have a hierarchical structure. A network can have up to 3 levels , therefore the node numbers have up to to 3 levels. The representation at the AMO-Interface is (except with AMO KNMAT)

aa-bbb-ccc, where

aa = Level 2 (Domain) Area number (0-29)

bbb = Level 1 (Subdomain) Area number (0-253)

ccc = Level 0 (Node) Node number (0-999)

A multi level node number is regarded as unique if it is different in at least one level of the other node numbers. The node number 0 in lower levels means "any" (e.g. 2-0-0). High-order zeros can be left out (e.g. 0-0-2 = 2).

5.1.6.3 Service Information

The AMO user is informed by a note (also see AMO application descriptions).

5.1.6.4 Physical Node Number

A physical node number in the AMO ZAND (configured with the parameter PNNO) is the node number which defines a system (PABX). Per system only one physical node number is possible.. The Phyisical Node number serves as a base for the automatic determination of the network topology (AMO KNTOP) and the generation of the call IDs and leg IDs.

5.1.6.5 Virtual Node Number

A virtual node number marks a virtual node with all its subscribers and attendants. The virtual node numbers are managed in a table of their own with the AMO KNDEF under the type =OWN and must be different from the physical node number. Application examples can be found in the sections alternate routing (LCR) and the Phone number modification.

5.1.6.6 Fictive Node Number

These are a special form of a virtual node number to manage connections to systems or facilities (e.g. servers) which do not recognize node numbers. It is possible to enter the fictitious node number as the ONNO of the remote system(e.g. CO connections , VMS, Dictation equipment, PSE, Foreign system, analog Tie, digital Tie circuits to a foreign node). The number is assigned to a circuit with the AMO TACSU, TDCSU and TSCSU (activation by means of COT parameters) and an accompanying entry in the AMO KNDEF (under type = FOREIGN with the required codes)is also required.

5.1.6.7 Originating Node Number

The Originating node number (ONNO) is the virtual or fictitious node numbers which are at the starting point of a connection.

5.1.6.8 Destination Node Number

Destination Node numbers (DNNO) are those virtual or fictitious node numbers which are destinations of a connection or connection set-up.

IMPORTANT: All node numbers of a network must be unique and should have the same level format.

5.1.7 Node Codes

5.1.7.1 Physical Node Code

This node code number is the code number with which a physical node can be reached by other nodes network wide. A node code number must be defined for every node in the network. This applies to both open and closed numbering (because of the feature route Optimization). The physical node code is configured with AMO ZAND, Parameter PNODECD , and with AMO WABE with the DAR OWNNODE.

5.1.7.2 Virtual Node Code

This node code number is the code number with which a virtual node can be reached by other nodes network wide. The virtual node code number is provided with AMO KNDEF, parameter NODECD for the unknown numbering plan and also AMO WABE with the DAR OWNNODE. Note: If a physical node contains several virtual nodes, then several entries are also necessary in the AMO KNDEF. For each virtual node number the parameters NODECD and OWNNODE (with AMO WABE) have to be configured..

The node code is for open numbering and is modified by AMO KNMAT for the phone number("calling numbers") modification feature.

5.1.7.3 Area, Area Numbering

The area which comprises all the nodes of a network corresponds to Level 0 of a hierarchical network structure

An area defines all the nodes of a network including its sub-networks (see also definition of hierarchical node numbers). The area number defines the area for administration purposes. A Level 0 area includes all the networked nodes of that level, and all the sub-networks at sub-network levels 1 and 2 which are accessible through the nodes of the level 0 area. A Level1 area includes all the networked nodes of the sub-network accessible through a particular node in a Level 0 area as well as any sub-networks at sub-network level 2 which are accessible through the nodes of the level 1 area.

5.1.7.4 Area Code

The area code forms part of a station number in the UNKNOWN OpenScape 4000 numbering scheme for open numbering. The area code is the route code dialled to access a specific area. The area codes can correspond to the node number hierarchy level, but do not have to. For example, the node with the node number 1-2-3 may have the node code "99". This is the standard case in

single-level networks converted to multi-level networks, if the station numbers are to remain unmodified. The node may also have the 3-level code 11-80-99. In this case, the level 2 area code is 11, the level 1 area code is 80, and the level 0 area code is 99. A station number 4711 within that node must then be dialled as 1180994711 from other nodes in the network.

The area codes are entered under the appropriate network level in the KNMAT AMO (LEVEL=0 or 1 or 2).

5.1.7.5 Destination System Number

The destination system number (DESTNO) is used in closed numbering schemes to assign the dialed network call number to the routes of outgoing trunk groups. The DESTNO only needs to be unambiguous within a node.

5.1.7.6 Route Code

The route code is the dialed digit sequence by means of which a particular route is seized (e.g. trunk code, tie trunk code). Only in a closed numbering scheme are there "fictitious" route codes which are not dialed.

5.1.7.7 Area-Code

An Area (also called domain here) is a closed numbered sub network concealed within an open numbered network with several virtual nodes. You reach an Area with a common code number, the Area code.. These must be set up in every node in the Area (with AMO WABE) with DAR OWNNODE .From "the outside" the Area looks like a single node which is reached with the Area Code. Also a (physical node number) PNNO must be assigned to every node in the Area. For the feature "Route Optimization" you must in addition establish a physical node code number (PNODECD) which must be unique within the complete Area.
The Area code number is entered as the open numbering node code number in AMO KNMAT for modification of station numbers.

IMPORTANT: An Area may be established only in level 0!

5.1.7.8 Tie Code

Another expression for the Route code number (colloquial)

IMPORTANT: In principle, every node can be dialed in the network with several code numbers.These codes must then lead to AMO wabe DAR= OWNNODE. You must, however, add one of these code numbers as a physical node code number (with AMO ZAND, parameter PNODECD).

5.1.7.9 Route

Station-station connection, station-circuit connection or circuit-station connection involving at least 2 PABXs in a network

5.1.7.10 Path

Station-station connection, station-circuit connection or circuit-station connection within a PABX.

5.1.7.11 Source Group

A source group SRCGRP is a subdivision of a physical node into single groups which doesn't have to be limited to a location. E.g. the subdivision into source groups makes possible group dependent or shelf dependent LCR within a PABX e.g. for emergency numbers.

5.2 Alternate Routing on Error

5.2.1 Feature Description

This feature provides an additional possibility to reach an alternate destination in case of voice calls, if the called subscriber/ personal attendant is in an **o**ut_**o**f_**s**ervice (**OOS**) situation.

The feature performs a new kind of alternate routing mechanism, using new predefined alternate routing destination numbers, which can be subscriber individual or source group related. In some cases (see below), new authorizations will be validated.

In total, 6 different OOS scenarios of the called subscriber/ personal attendant will be handled.

1) The called subscriber / personal attendant is OOS because of a device/ board error.

(no additional authorization necessary)

2) The called subscriber / personal attendant is OOS because switched off by AMO.

(authorization necessary for doing alternate routing when manual switched off by AMO)

3) The accesspoint (AP) of the called subscriber is in an AccessPoint Emergency (APE) situation in relation to the AP of the calling device.

(no additional authorization necessary)

4) The called HFA IP phone is in OOS and has registered at OpenScape Business/HiPath 3000 because of IP errors.

(authorization necessary for move logon from OpenScape 4000 to OpenScape Business/HiPath 3000)

5) The called HFA IP phone is OOS because of a system failure and has been moved to / has logged on to another OpenScape 4000 node.

   (authorization necessary for move logon from OpenScape 4000 to another OpenScape 4000 node)

6) For HFA IP subscribers, which have de-registered and are newly registered somewhere else, a TSC setup from a XPRESSION server for indication of a voice message, will be alternate routed to that switch, where the HFA IP subscriber is registered actually.

Normally, alternate routing will be done only once for a call. In case of an alternate routing because of APE, it might be necessary to execute another alternate routing again for on of the other 3 mentioned OOS scenarios.

The reason why is, that in kind of APE, in the AP of the calling device, it can not be verified for sure, whether the called subscriber in the target AP is in a seizable condition.

Because of this consideration, it is possible to administer two types of alternate routing destination numbers (OOS and APE) for a subscriber or a whole source group with different alternate destinations.

5.2.1.1 Main goals for the alternate routing destination numbers in respect to OOS scenario

- Device/ board error

  The goal is, to reach the called subscriber either with its mobile phone number, with an alternate number, via PSM or to lead the call to attendant, voice mail, phonemail or something else.
- Manual deactivated (by AMO) with activated authorization for alternate routing

  If subscribers are manually deactivated by AMO command, alternate routing will only be performed, if the subscribers are authorized for requesting alternate routing when called after a manual deactivation.

  The goal are identical as for device/ board errors.
- APE situation between APs of calling device and called subscriber/ personal attendant.

  In case of an APE situation between APs of calling device and called subscriber/personal_attendant, the involved APs act as single switches.

  The goal is, to reach the called subscriber in its AP via public trunk access. As a precondition, a public trunk access has to be administered between the related APs with routing elements without internal rerouting possibilities.

  Routing elements, that are defined as with internal rerouting, will not be used for alternate routing on error in general.

- Deregistered HFA IP phones (OpenScape 4000 --> OpenScape Business/ HiPath 3000).

  Special authorized HFA IP phones can move their logon location from OpenScape 4000 to OpenScape Business/HiPath 3000 in case of IP errors.

  The goal is, to reach this HFA IP phones in their new logon location via public trunk access under their individual (modified) extension numbers.

  TSC setups with service MWI to a unregistered HFA IP subscriber will be alternate routed to that switch, where the HFA IP phone is actually registered.

  This is a special usage of the feature, as in this scenario, alternate routing only will be started, if the administered alternate routing destination number points to a tie trunk (no public trunk).

  The reason for this is, that it is not possible to transport a MWI service via public network.
- Deregistered HFA IP phones (OpenScape 4000 --> OpenScape 4000).

  HFA IP phones are normally registered at a OpenScape 4000 node with Xpressions. Special authorized HFA IP phones can move their logon location from OpenScape 4000 to another OpenScape 4000 node in case of system failure.

  The goal is, to reach this HFA IP phones in their new logon location via tie trunk access under their individual (modified) extension numbers **and** the HFA IP phones will be supplied with MWI update information of the Xpressions server.

  The MWI led will be switched on or switched off at the HFA subscriber. The HFA subscriber now has the possibility to call the Xpression server from the alternate OpenScape 4000 via tie trunk access in order to pick up its voice messages.

  If the HFA subscriber has different numbers in default node and alternate node, it may be necessary to use the mailbox number of the default node also when picking up the voice messages out of alternate node.

  Alternate Routing on Error via tie trunks to another OpenScape 4000 should be used very restrictive. Furthermore, the administration should only be done subscriber individual and not source group related.

5.2.1.2 Usage of Alternate Routing Destination Numbers

You can administer an alternate routing destination number either as a subscriber individual alternate routing destination number for one subscriber or a source group related alternate routing destination number for a whole source group of the related subscribers.

In order not to waste memory, for some OOS scenarios, it might be enough, You would confine to source group related alternate routing destination numbers.

As You can administer a source group related alternate routing destination number either as a complete number (EXTNO = 0) or as a incomplete number (EXTNO > 0), You also have the possibility to reach subscriber individual destinations with the supplementation. request (EXTNO > 0).

A supplementation will be done at time of alternate routing execution by call processing with the administered length (EXTNO) of the called subscribers extension number.

If You administer both kinds, and the numbers are different, the subscriber individual alternate routing destination numbers will be used with higher priority than the source group related alternate routing destination numbers. With this design, You can treat special subscribers (vips) different than the rest of subscribers of a source group.

In case of usage, the alternate routing destination number will be checked for being usable to reach an alternate destination successfully. If it is not possible, to reach an alternate destination with the subscriber individual alternate number, another attempt will be done with the source group related alternate routing destination number.

Depending of the OOS scenario (1 --> 4) the alternate routing destination numbers will be checked for usage in following hierarchical manner:

- OOS because device/board error
  - subscriber individual alternate routing destination number for OOS
  - source group related alternate routing destination number for OOS
- OOS because manual deactivated with activated authorization for alternate routing
  - subscriber individual alternate routing destination number for OOS
  - source group related alternate routing destination number for OOS
- OOS of deregistered HFA IP phones with activated authorization for move logon
  - subscriber individual alternate routing destination number for OOS
  - source group related alternate routing destination number for OOS
- OOS because of APE situation between APs of called subscriber and calling device
  - subscriber individual alternate routing destination number for APE
  - source group related alternate routing destination number for APE

  If the called subscriber is not a HFA IP phone with the activated authorization for move logon, 2 additional attempts will be done
  - scriber individual alternate routing destination number for OOS
  - source group related alternate routing destination number for OOS

Device / board error	Manual deactivated	Moved logon	AP Emergency
subscr. indiv. (OOS)	subscr. indiv. (OOS)	subscr. indiv (OOS)	subscr. indiv. (APE)
srcgrp. related (OOS)	srcgrp. related (OOS)	srcgrp. related (OOS)	scrgrp. related (APE)
			subscr. indiv (OOS)
			scrgrp. related (OOS)

5.2.1.3 Philosophy of loop avoidance in public/ OpenScape 4000/HiPath 4000 network

If the administered alternate routing number leads to an external destination within the OpenScape 4000/HiPath 4000 network, special classmark information will be transported in the call_setup message, that takes care of loop avoidance in the target OpenScape 4000 switch. No additional administration is necessary for that case.

If the administered alternate routing number leads to an external destination within the OpenScape 4000/HiPath 4000 network but using a partly routing via public network, this classmarks cannot be transported. In this case, the loop avoidance only can be done with use of an enlarged alternate routing destination number. For this purpose, 2 DARs "ALTRTOOS, ALTRTAPE" are newly created.

Example_1:

In case of AP Emergency, the calling device out of AP_x wants to reach the called subscriber in AP_y via public network.

Called subscribers extension number = 4711, outgoing public trunk access = 004989, incoming trunk access = 722, digit string, that leads to DAR "ALTRTAPE" in the switch = 99.

The individual alternate routing number could be = 004989-722-99-4711.

The source-group related alternate routing number could be = 004989-722-99.

Example_2:

In case of OOS, for the called device (NOT_READY) in switch_1, the alternate routing number will be designed in that way to reach an alternate subscriber in OpenScape 4000 (switch_2) via public network.

Extension number of alternate subscriber in switch_2 = 4812, outgoing public trunk access = 004989, incoming trunk access (switch_2) = 723, digit_string, that leads to DAR ' ALTRTOOS" in switch_2 = 98.

The individual alternate routing number could be = 004989-723-98-4812

A source-group related alternate routing number is not allowed in this case.

Warning:

The use of the 2 new DARs "ALTRTAPE" , "ALTRTOOS" for designing the alternate routing number is only an option for loop avoidance in public network. The necessity to use this option is much higher in case of alternate routing for APE than for OOS. Nevertheless, the option in general should be used only in following cases:

- An alternate destination should be reached in a OpenScape 4000 switch partly routed via public network.
- The used new DARs "ALTRTAPE" or "ALTRTOOS" have to be administered in the target OpenScape 4000 switch.

If the DARs are unknown, the digit translation in the target switch surely will not find a valid result.

If this option is used in case of a routing only in OpenScape 4000/HiPath 4000 network, it does not create a problem at all, but it is not necessary.

5.2.1.4 Philosophy of supplementation (parameter EXTNO)

If You administer a source group related incomplete alternate routing destination number, You also have to define the number of the called subscribers digits for the supplementation.

If You administer the source group related alternate routing destination number as a complete number, You have to set the parameter EXTNO = 0;

If You administer the source group related alternate routing destination number as a incomplete number, You have to set the parameter EXTNO to the number of the called subscribers digits, that are requested for supplementation.

The plausibility of a supplementation (design and usage) depends from WABE result of the source group related alternate routing destination number as well as from the alternate routing type.

The plausibility checks of the AMO APRT allow the input of EXTNO > 0 only for those alternate routing destination numbers, that do not lead to WABE result = subscriber. But there are a lot of other possibilities that are not restricted by the AMO, but cannot be executed at the time of usage for special alternate routing scenarios.

A switch can be devided into several virtual switches. In every virtual swich, subscribers can have numbers, that are also allocated in other virtual switches. It is only possible, to distinquish this numbers with help of their virtual node access code, which is a part of the subscribers number.

When administering the parameter EXTNO, You must be aware of this.

- Usage of supplementation for APE

  If You want to reach the subscribers, that are in APE situations, via public trunk loop in their own APs under their individual subscriber numbers, You must administer a source group related incomplete alternate routing destination number for type = APE, that contains a trunk access code for going public network and a incoming trunk access code to reach the APs, where the subscribers are located in, and as an option the digit string, that leads to DAR = "ALTRTOOS".

  The missing subscribers extension numbers will be supplemented at time of call execution by call processing.

  You have to administer, how many digits of the subscribers extension numbers should be used for supplementation with setting the parameter EXTNO > 0.

  In this example, it is obvious, that EXTNO has to be set to the length of the subscribers extension numbers.

  If You set the parameter EXTNO bigger than the length of the subscribers extension numbers, it is tolerated and will be decremented to the real length.

  If You set the parameter EXTNO smaller than the length of the subscribers extension numbers, this alternate routing destination number can not be used for that case.

Example 3:

Outgoing public trunk access = 004989, incoming trunk access = 722,

Number (subscriber_A) = 54321, digit_string, that leads to DAR "ALTRTAPE" = 99

Administered source_group related alternate routing number = 004989-(99)-722

EXTNO = 5	-->	supplementation done / result = 004989-722-(99)-54321
EXTNO = 6	-->	supplementation done / result = 004989-722-(99)-54321
EXTNO = 4	-->	supplementation not possible
EXTNO = 0	-->	supplementation not requested / the number 004989722(99) do not lead to a valid destination, but neither by AMO nor at time of usage, this can be verified.

- Usage of supplementation for OOS (device/ board error or deactivated by AMO)

  If you want to reach the subscribers, that are in OOS situation, with searching via PSM under their individual search numbers, You must administer a source group related alternate routing destination number for type = OOS, that contains the PSM access code.

  The missing subscribers extension numbers will be supplemented at time of call execution by call processing.

  You have to administer, how many digits of the subscribers extension numbers should be used for supplementation with setting the parameter EXTNO > 0.

  If the PSM is designed with search length = 0, the parameter EXTNO has to be set to the length of the called subscriber numbers.

  If the PSM is designed with search length = x, the parameter EXTNO has to be set to that value (x). The normal situation is, that the search length is smaller than the length of called subscribers. In this case, the supplementation result leads to a cut search number. The cutting will be done from right hand side.

Example 4:

PSM access code = #77

Number (subscriber_A) = 54321

Administered source group related alternate routing number = #77

Search length = 3

EXTNO = 3	-->	supplementation done / result = #77-543
EXTNO = 4	-->	supplementation done / result = #77-543
EXTNO = 2	-->	supplementation not possible
EXTNO = 0	-->	supplementation not requested / invalid

Example 5:

PSM access code = #77

Number (subscriber_A) = 54321

Administered source group related alternate routing number = #77

Search length = 0

source group related alternate routing number = #77

EXTNO = 5	-->	supplementation done / result = #77-54321
EXTNO = 6	-->	supplementation done / result = #77-54321
EXTNO = 2	-->	supplementation not possible
EXTNO = 0	-->	supplementation not requested / invalid

- Usage of supplementation for OOS in case of moved logon

  If You want to reach the HFA IP phones, that have moved their logon location from OpenScape 4000 to OpenScape Business/HiPath 3000 in their new logon switch under their individual extension number, You have to administer a source group related incomplete alternate routing destination number for type = OOS, that contains a trunk access code for outgoing public network and an incoming trunk access code, to reach the OpenScape Business/HiPath 3000.

  The missing subscriber extension numbers will be supplemented at time of call execution by Call processing.

  You have to administer, how many digits of the subscribers extension numbers should be used for supplementation with setting the parameter EXTNO > 0.

  It may be possible, that OpenScape Business/HiPath 3000 works with a different number scheme than OpenScape 4000.

  If the HFA IP phone extension numbers are identically in both switches, You have to set the parameter EXTNO to the identical extension number length of the HFA IP phones.

  If the HFA IP phone extension numbers in OpenScape Business/HiPath 3000 are smaller than in OpenScape 4000 (see example 4), You have to set the parameter EXTNO to the smaller HFA IP phone extension number length. in OpenScape Business/HiPath 3000. The later performed supplementation then will cut the HFA IP phone extension numbers from left hand side on.

  If the HFA IP phone extension numbers in OpenScape Business/HiPath 3000 are bigger than in OpenScape 4000 (see example 5), You have to set the parameter EXTNO to the length of the HFA IP phone extension number in the OpenScape 4000. As the extension numbers in OpenScape Business/HiPath 3000 starts with an additional digit (9), You must add this as a prefix to the source group related alternate routing number.

Example 6:

Outgoing public trunk access = 004989,

Incoming trunk access for OpenScape Business/HiPath 3000 = 865

Number (HFA IP phone_A in OpenScape 4000) = 54321

Number (HFA IP phone_A in OpenScape Business/HiPath 3000) = 4321

Administered source group related alternate routing number = 004989-865

EXTNO = 4	-->	supplementation done / result = 004989-865-4321
EXTNO = 5	-->	supplementation done / result = 004989-865-54321 In OpenScape Business/HiPath 3000 -, the correct HFA IP phone can not be reached. No kind of syntax check can avoid this malfunction.
EXTNO = 3	-->	supplementation done / result = 00498986-5321 In OpenScape Business/HiPath 3000 -, the correct subscriber can not be reached. No kind of syntax check can avoid this malfunction.
EXTNO = 0	-->	supplementation is not requested / invalid

Example 7:

Outgoing public trunk access = 004989,

Incoming trunk access for OpenScape Business/HiPath 3000 = 865

Number (HFA IP phone_A in OpenScape 4000) = 54321

Number (HFA IP phone in OpenScape Business/HiPath 3000) = 9-54321

Administered source group related alternate routing number = 004989-865-9

EXTNO = 4	-->	supplementation possible / result = 004989-865-9-4321 In OpenScape Business/HiPath 3000, the correct subscriber can not be reached No kind of syntax check can avoid this malfunction.
EXTNO = 5	-->	supplementation done / result = 004989-865-9-54321
EXTNO = 6	-->	supplementation done / result = 004989-865-9-54321
EXTNO = 0	-->	supplementation is not requested / invalid

5.2.1.5 Implausible conditions for supplementation

1) The administered source group related alternate routing destination number leads to WABE result unequal trunk or PSM/PSE and the parameter EXTNO was set > 0.

- It makes no sense, to supplement a source group related alternate routing destination number, that leads to a destination unequal trunk or PSM.

This will be rejected by syntax check of AMO APRT.

2) In case of routing type APE, the administered source group related alternate routing destination number, leads to a public trunk access.

- If the value of parameter EXTNO is administered smaller than the length of the called subscribers extension number, the related subscriber can not be reached.

  The implausibility of the source group related alternate routing destination number for this OOS scenario cannot be detected by the syntax checks of AMO APRT and will only be verified at time of usage.

  The result is, that this alternate routing destination number can not be used for routing type APE.

- If the value of parameter EXTNO is administered bigger than the length of the called subscriber extension number, it will be ignored.

  In order to avoid wrong or misleading displays, the supplementation then will be done only up to the real length of the called subscribers extension number.

- If the value of parameter EXTNO is administered bigger than the maximum length of subscribers extension number, the command will be rejected by syntax check of AMO APRT.
- If the administered source group related alternate routing destination number contains only a trunk access into public network and the value of parameter EXTNO = 0, neither an alternate destination nor the called subscriber in its AP can be reached.

  A supplementation is necessary in this situation and a value of parameter EXTNO = length of called subscriber must be set.

  The implausibility of the source group related alternate routing destination number for this routing scenario cannot be detected by the syntax checks of AMO APRT and will only be verified at time of usage.

  The result is, that this alternate routing destination number can not be used for routing type APE.

3) In case of alternate routing type = OOS because of device/board error or manual deactivated by AMO, the administered source group related alternate routing destination number leads to WABE result = trunk.

- If the value of parameter EXTNO is > 0, a supplementation with the called subscribers extension number is requested. This makes no sense

in general, as this subscriber is in OOS state and cannot be seized successfully, even if doing a loop over public or tie trunk.

The implausibility of the source group related alternate routing destination number for this routing scenario cannot be detected by the syntax checks of AMO APRT and will only be verified at time of usage.

The result is, that this alternate routing destination number can not be used for this routing scenario

4) In case of alternate routing type = APE or OOS because device/board error or deactivated by AMO, the administered source group related alternate routing number contains the access code for PSM/ PSE

- If the PSM/ PSE is designed with search length = 0, a supplementation is necessary with the length of called subscribers number.
  - If the administered parameter EXTNO is smaller than length of called subscriber, a PSM search cannot be successful. The implausibility of the source group related alternate routing destination number for this routing scenario cannot be detected by the syntax checks of AMO APRT and will only be verified at time of usage. The result is, that this alternate routing destination number can not be used for this routing scenario
  - If the administered parameter EXTNO is bigger than length of called subscriber, a PSM search is possible. The supplementation will done with the real length of the subscribers extension number.
  - If the administered parameter EXTNO is bigger than maximum extension number length, the command will be rejected by syntax check of AMO APRT
- If the PSM is designed with search length = x, a supplementation is necessary with this length x
  - If the administered parameter EXTNO is smaller than search length x, a PSM search cannot be successful. The implausibility of the source group related alternate routing destination number for this routing scenario cannot be detected by the syntax checks of AMO APRT and will only be verified at time of usage.
  - If the administered parameter EXTNO is bigger than search length x, a PSM search is possible. The supplementation will done up to the search length x.

5) In case of alternate routing type = OOS because HFA move logon from OpenScape 4000 to OpenScape Business/HiPath 3000, the administered source group related alternate routing destination number has to be designed in that way, that is possible to reach the moved subscriber in its new switch location via trunk access.

- If the administered parameter EXTNO = 0, the source group related alternate routing destination number is designed as a complete number.

  As it is not possible, to reach individual HFA IP phones with a unique unsupplemented alternate routing destination number, this number cannot be used for this routing scenario.

  The implausibility of the source group related alternate routing destination number for this routing scenario cannot be detected by the syntax checks of AMO APRT and will only be verified at time of usage.

- If the value of parameter EXTNO is bigger than the length of the called subscriber number in OpenScape 4000, the supplementation will be

done up to the real extension number length of the HFA IP phone in OpenScape 4000.

5.2.1.6 Plausibility of alternate routing destination numbers

The AMOs SDAT, ACSU and APRT allow only numbers, that leads to a valid wabe result. Call processing, when trying to use the administered alternate routing destination number does a lot of additional plausibility checks in relation to the OOS scenario, the involved devices, the READY state of the alternate destination etc.

The main goal of this additional checks are, to avoid loops in the network and to allow other alternate destinations (call_forward), if the designed alternate routing numbers would lead to a invalid or not seizable destination.

HFA IP phones with the authorization for moving their logon from OpenScape 4000 to OpenScape Business/HiPath 3000 may be registered already in OpenScape 4000 and not yet deregidtered in OpenScape Business/HiPath 3000. In order to avoid an alternate routing loop between this 2 locations, the IP address of the partner gateway has to be administered for the related source group (of the HFA IP phones).

Call processing, when finding out, that the calling device transports the same IP address as administered in the source group of the called HFA IP phone, avoids an alternate routing.

5.2.1.7 Advisory output

In order to be informed about not usable administered alternate routing data, You can request a advisory printout with following AMO command.

```
CHANGE-DIAGS:PROCID=CC,COMP=CP2,S07=ON
```

Whenever at time of execution, alternate routing on error is not possible because of invalid alternate routing number administration, an advisory printout like following example will be printed out.

```
F4066 M4 N0093 NO ACT   BPA   CP       ADVISORY

03-09-10 13:32:14
 ALARM CLASS:CENTRAL:023

 CC:15359  EC: 2017  UA:9740:4BB6  SP:C078:1136
 LD:01-01-079-004
 DT:6C  ST:6C  SN:B401  CEVT:EF  CSEV: 0  CST: 0

 FORMAT:24   MESSAGE-ID: 00060
    1.                   5.                9.
 13.
17.              21.               25.               29.
    1A8B3A00 1D3D001C 01040303 04040000  584F7070 B8003000
C04ED84E 84117DC1
    02040000 00000000 00000000 00000000  00000000 00000000
00000303 04040000
    01000001 03000000 03040000 00030504  00000000 00000000
00000000 00000000
    00000000 00000000 00000000 02010000  08000000 00000103
```

```
080C0000 08050000
    00000100 00000000 00000000 01
  byte 1:         diagnose format        (1A)
  byte 2:         format length          (8B)
  byte 3-4:       calling loden          (3A00)
  byte 5:         calling device type:   (1D) =
DB_CP_DEVTYP_DIGITE_SUB_A
  byte 6-7:       called loden           (3D00)
  byte 8:         called device type     (1C) =
DB_CP_DEVTYP_DIGITE_MAIN
  byte 9:         called source group    (01)
  byte 10:        called number length   (04)
  byte 11-32:     called number          (03 03 04 04
.....................)
  byte 33:        altern route reason    (02)   01:   OOS
 AP
emergency
                                                 02:   OOS
deactivated by AMO
                                                 03:   OOS
 device
/ board error
                                                 04:   OOS
 move
HFA move logon
  byte 34:        altern rej reason      (04)   01: no
 gateway_IP
address defined
                                                 02:
 defined
gateway_IP = received gateway_IP
                                                 03:  no
 valid
wabe result for alt_rt_on_err
                                                 04:
 alt_rt_nr
too short
                                                 05:
 alt_rt_nr
equals to calling/ redir nr
                                                 06:
 supplementation
of alt_rt_nr. impossible
                                                 07:
 alt_rt_nr is/
becomes too long
                                                 08:
 alt_rt_nr
same as redir_nr
                                                 09: length
 of
supplementation invalid
                                                 10:
 alt_rt_nr
leads to not allowed dest
```

```
                                                          11:
 alt_rt_nr not
usable for PSM cond.
                                                          12:
 alt_rt_nr not
usable for PSE cond.
                                                          13:
 alt_rt_nr not
usable for PSE_CZ ond.
                                                          14: dest.
 of
alt_rt_nr not free
                                                          15: no
 loden
found with alt_rt_nr
                                                          16:
 alt_rt_nr
equals calling or called nr
                                                          17: suppl.
 not
allowed for OOS
                                                          18:
 alt_rt_nr is
source_group complete
                                                          19: no
 emergency nr
defined for HFA IP phone
                                                          20:
 alt_rt_nr
defined but not usable
                                                          21:
 general
implausibility in alt_rt_on_err
  byte 35         length subscr. indiv. alternate routing
 number
for type = APE
  byte 36 - 57    subscriber individual alternate routing
 number
for type = APE
  byte 58         length srcgrp related alternate routing
 number
for type = APE
  byte 59 - 80    source group related alternate routing
 number
for type = APE
  byte 81:        number of supplemented digits for type=
 APE
  byte 82 - 85    gateway_IP address ( not used )
  byte 86         length subscr. indiv. alternate routing
 number
for type= OOS
  byte 87 - 108   subscr. indiv. alternate routing number
 for
type= OOS
  byte 109        length srcgrp related alternate routing
 number
```

```
for type= OOS
  byte 110 - 131  source group related alternate routing
 number
for type= OOS
  byte 132        number of supplemented digits for type =
 OOS
  byte 133 - 136  gateway_IP address  for HFA move logon
  byte 137 - 140  gateway_IP address in CPB
```

5.2.2 User interface

5.2.2.1 Called subscribers (A,B,C,D,E of one source group), are not reachable, because of device/board errors

- What are the main goals ?

  Calling a subscriber specific individual alternate routing destination number (mobile phone number)

  Calling a general destination like voicemail or attendant.
- What is possible ?

  The alternate routing number can be designed to reach any other destination.

  If the alternate routing destination number leads to a outgoing trunk access, only those route elements will be used for alternate routing, that are defined as with " no internal rerouting ".
- What You want is:
  - Calls to subscriber_A should be alternate routed to a mobile phone number 017nn...nn.
  - Calls to subscriber_B should be alternate routed to subscriber_F
  - Calls to all other subscribers of the related source group, (C,D,E) should be alternate routed to the attendant.

  For the related source group (C,D,E), You can define a source group related complete alternate routing destination number for routing type = OOS

```
ADD-APRT:TYP=ALTERR,SCRGRP=<sg_subscr>,ALTRTYPE=OOS,
 AlTRTNR=<no_melden>;
```

For routing type = OOS, You must define a subscriber individual alternating routing destination number for subscriber_A

```
CHANGE-SDAT: STNO=<no_subscr_A>,TYPE=DATA1,
 STNOOOS=<017nn---nn>;
```

For routing type = OOS, You must define a subscriber individual alternate routing destination number for subscriber_B

```
CHANGE-SDAT: STNO=<no_subscr_B>,TYPE=DATA1,
 STNOOOS=<no_subscr_F>
```

Make sure, that the maximum number of individual alternate routing destination numbers is big enough, otherwise increase the maximum number value by AMO DIMSU

```
ADD-DIMSU: TYP=USER, ALTERR =<new_value>;
```

- What You want is: Calls to all subscribers of source group = 2 should be alternate routed to PSM

  It will be assumed, that the PSM works with LENGTH_SEARCH_NO = 0.

  For routing type = OOS, You must define a source group related incomplete alternate routing destination number for that source group, the called subscribers are members of.

  As for every subscriber an individual search number is requested, the alternate routing destination number must be a incomplete number containing only the access code for PSM.

  You must set the number of the supplemented digits (parameter EXTNO) equal the number length of subscribers extension number.

  ```
  ADD-APRT:TYP=ALTERR,SRCGRP=<sg__subscr>,
   ALRTYPE=OOS,ALTRTNR=<no_psm>, EXTNO=<length_subscr_no>;
  ```

  If the PSM works with length search no = x (1-6), You must administer the parameter EXTNO = <length_search_no>l

  ---

  IMPORTANT: If You change the source group of a subscriber with AMO SDAT, the administered source group related alternate routing informations may not be valid anymore for this subscriber !

- Voicemail is the chosen destination of the alternate routing on error

  ---

  NOTICE: If a voicemail is the chosen destination of the ARoE (e.g. via **STNOOOS**) then COT **ARCF** is needed to ensure a Diversion Leg is generated towards the Voicemail and the correct mailbox is reached.

5.2.2.2 Called subscribers (A) is not reachable, because deactivated via AMO with additional request for alternate routing

- What are the main goals ?

  Calling a subscriber specific individual alternate routing destination number (mobile phone number)

  Calling a general destination like voicemail or attendant.
- What is possible ?

  The alternate routing number can be designed to reach any other destination.

  If the alternate routing destination number leads to a outgoing trunk access, only those route elements will be used for alternate routing, that are defined as with " no internal rerouting ".
- What You want is: Calls to a deactivated subscriber_A should be alternate routed to voicemail.

  For routing type = OOS, You must define either a subscriber individual alternate routing destination number for the subscriber_A or a source group related alternate routing destination number for that source group, subscriber_A is a member of.

  ```
  CHANGE-SDAT:
  STNO=<no_subscr_A>,TYP=DATA1,STNOOOS=<no_voicemail>; or
   ADD-APRT:TYP=ALTERR,SRCGRP=<sg_subscr_A>,ALTRTYPE=OOS,

  ALTRTNR=<no_voicemail>
  ```

  You must set a request for alternate routing, before deactivating the subscriber_A with AMO SDAT

  ```
  CHANGE-SDAT:STANO=<no_subscr_A>,TYP=DATA1,AMOALTRT=J;
  ```

  If You set this request and no kind of alternate routing destination number was administered before, the AMO SDAT will print out a hint-message.

5.2.2.3 Called HFA IP phones (A,B) are not reachable, because of IP errors, they moved their logon location from OpenScape 4000 to OpenScape Business/HiPath 3000

- Device configuration:

	OpenScape 4000	OpenScape Business/ HiPath 3000
number (HFA IP phone A):	54711	4711
number (HFA IP phone B):	54712	4712
station number length:	5	4

- What are the main goals ?

  The main goal is, to call the OpenScape 4000 deregistered HFA IP phone in its new logon switch (OpenScape Business/HiPath 3000) via public trunk under its new or identical subscriber number.

- What is possible ?

  The alternate routing destination number can be designed as outgoing public trunk access or outgoing tie trunk access followed by incoming trunk access to reach the OpenScape Business/HiPath 3000.

  The alternate routing destination number can be designed as a subscriber individual alternate routing number or as an incomplete source group related alternate routing number (with supplementation request).

  If the alternate routing destination number leads to a outgoing trunk access, only those route elements will be used for alternate routing, that are defined as with " no internal rerouting ".

  Not allowed is a source group related complete alternate routing number, as it is not possible, to reach individual subscribers in this way.

  Not allowed are alternate routing numbers, that do not lead to a trunk access.
- What You want is: Calls to not reachable HFA IP phones, that have moved their logon location from OpenScape 4000 to OpenScape Business/HiPath 3000, should be routed to the new logon location via public network. In OpenScape Business/HiPath 3000, the HFA IP phones have a different number scheme than in OpenScape 4000.

  You must authorize those HFA IP phones, that can move their logon location from OpenScape 4000 to HiPath 300

  ```
  AEND-SDAT: STANO = <no_hfa_ip_A>, TYP=DATA1, UZHFAIP=J;
  AEND-SDAT: STANO = <no_hfa_ip_B>, TYP=DATA1, UZHFAIP=J;
  ```

  You must set the gateway_IP address(es) for the source group(s), the HFA IP phones are members of. This is necessary to avoid loops within OpenScape 4000 and OpenScape Business network/HiPath 3000 network.

  For example, it could be possible, that a HFA IP phone is already deregistered in OpenScape 4000 and not yet registered in OpenScape Business/HiPath 3000. In this case, every switch tries to perform an alternate routing to the other switch (ping/pong).

  ```
  ADD-APRT: TYP= ALTERR, SRCGRP=<srcgrp_hfa_ip_A>,
   ALRTTYPE=OOS, GWIPADR=<ip_addr_gateway>;
  ```

  For type= OOS, You must define either subscriber individual alternate routing destination numbers for every HFA IP phone (A,B) or a source group related incomplete alternate routing destination number for the source group(s), the HFA IP phones are members of.

  A incomplete alternate routing destination number will be supplemented at time of usage with the extension number of the called HFA IP phone and with the administered length (parameter EXTNO). This makes it possible to reach individual subscribers in other switches.

  If You want to use only subscriber individual alternate routing destination numbers, You have to administer a subscriber individual alternate number for both HFA IP phones with outgoing trunk access to public network (004989), with incoming trunk access to reach the OpenScape Business/ HiPath 3000 (568) and the shortened part of the extension numbers (4711, 4712).

```
AEND-SDAT:STANO=<no_hfa_ip_A>, TYP = DATA1,
 STNOOOS=<004989-568-4711;
AEND-SDAT:STANO=<no_hfa_ip_B>, TYP = DATA1,
 STNOOOS=<004989-568-4712;
```

If You want to use only source group related incomplete alternate routing destination numbers, You have to administer the source group related alternate destination number with outgoing trunk access to public network (004989) and with incoming trunk access (568) to reach the OpenScape Business/HiPath 3000.

Furthermore, You must set the supplementary length (parameter EXTNO) to the length of the HFA IP phones number in the OpenScape Business/HiPath 3000, which is = 4.

```
ADD-APRT: TYP=ALTERR,
 SRCGRP=<srcgrp_hfa_ip_A>,ALRTTYPE=OOS,
 ALTRTNR=004989-568,EXTNO=4;
```

- Device configuration:

	OpenScape 4000	OpenScape Business/ HiPath 3000
number (HFA IP phone A):	54711	954711
number (HFA IP phone B):	54712	954712
station number length:	5	6

- What You want is: Calls to not reachable HFA IP phone, that have moved their logon location from OpenScape 4000 to OpenScape Business/HiPath 3000, should be routed to the new logon location via public network. In OpenScape Business/HiPath 3000, the HFA IP phones have a different number scheme than in OpenScape 4000.

  You must authorize those HFA IP phones, that can move their logon location from OpenScape 4000 to HiPath 300

  ```
  AEND-SDAT:STANO=<no_hfa_ip_A>, TYP=DATA1, UZHFAIP=J;
  AEND-SDAT:STANO=<no_hfa_ip_B>, TYP=DATA1, UZHFAIP=J;
  ```

  You must set the gateway_IP address(es) for the source group(s), the HFA IP phones are members of. This is necessary to avoid loops within OpenScape 4000 and OpenScape Business network/HiPath 3000 network. For example, it could be possible, that a OpenScape 4000 deregistered HFA IP phone is not yet registered in OpenScape Business/HiPath 3000 and every switch tries to perform an alternate routing to the other switch (ping/ pong).

  ```
  ADD-APRT:TYP=LTERR,SRCGRP=<srcgrp_hfa_ip_A>,
   ALRTTYPE=OOS, GWIPADR=<ip_addr_gateway>;
  ```

  For type= OOS, You must define either subscriber individual alternate routing destination numbers for every HFA IP phone (A,B) or a source group related incomplete alternate routing destination number for the source group(s), the HFA IP phones are members of.

  A incomplete alternate routing destination number will be supplemented at time of usage with the extension number of the called HFA IP phone and

with the administered length (parameter EXTNO). This makes it possible to reach individual subscribers in other switches.

If You want to use only subscriber individual alternate routing destination numbers, You have to administer a subscriber individual alternate number for both HFA IP phones with outgoing trunk access to public network (004989), with incoming trunk access to reach the OpenScape Business/ HiPath 3000 (568) , with a number prefix (9) and the extension numbers (54711,5 4712).

```
AEND-SDAT:STANO=<no_hfa_ip_A>, TYP=DATA1,
 STNOOOS=<004989-568-9-54711;
AEND-SDAT:STANO=<no_hfa_ip_B>, TYP=DATA1,
 STNOOOS=<004989-568-9-54712;
```

If You want to use only source group related incomplete numbers, You have to administer the source group related alternate destination number with outgoing trunk access to public network (004989) and with incoming trunk access (568) to reach the OpenScape Business/HiPath 3000.

Furthermore, You must set the supplementary length (parameter EXTNO) to the length of the HFA IP phones number in the OpenScape 4000, which is 5,

```
ADD-APRT:TYP=ALTERR,SRCGRP=<srcgrp_hfa_ip_A>,
 ALTRTYPE=OOS, ALTRTNR=004989-568-9, EXTNO=5;
```

5.2.2.4 Called HFA IP phones are not reachable, because of system failure errors, they moved their logon location from OpenScape 4000 to another OpenScape 400 (MWI Indication)

- Scenario

  HFA IP phones are normally registered at a OpenScape 4000 node with Xpressions. Special authorized HFA IP phones can move their logon location from OpenScape 4000 to another OpenScape 4000 node in case of IP errors.
- Main goal

  The goal is, to reach this HFA IP phones in their new logon location via tie trunk access under their individual (modified) extension numbers and the HFA IP phones will be supplied with MWI update information of the Xpressions server.

  The MWI led will be switched on or switched off at the HFA subscriber. The HFA subscriber now has the possibility to call the Xpression server from the alternate OpenScape 4000 via tie trunk access in order to pick up its voice messages.

  If the HFA subscriber has different numbers in default node and alternate node, it may be necessary to use the mailbox number of the default node also when picking up the voice messages out of alternate node.

  Alternate Routing on Error via tie trunks to another OpenScape 4000 should be used very restrictive. Furthermore, the administration should only done subscriber individual and not source group related.

- Administration

  In the node with Xpression allocation, following administration has to be done:

  – For HFA subscriber, it is necessary to set a mark for moving logon location
  ```
  CHANGE-SDAT:STNO=4711, TYPE=DATA1, MVHFAIP=YES;
  ```
  – In order to avoid network loops, it is necessary to set the partner gateway IP address for that sourcegroup, that is allocated to the related HFA subscribers.
  ```
  ADD-APRT:TYPE=ALTERR, SRCGRP=1, ALRTYPE=OOS,
   GWIPADR=<ip_address_of_gw>;
  ```
  – For the HFA subscriber, it is necessary to administer an alternate routing destination number, which leads via tie trunk to an alternate OpenScape 4000 node.
  ```
  ADD-SDAT:STNO=4711, TYPE=DATA1, STNOOOS=723-4711;
  ```
  – There is an other possibility, to administer an alternate routing destination number for the complete source group, the HFA subscriber is a member of (not recommended).
  ```
  ADD-APRT:TYPE=ALTERR, SRCGRP=1, ALRTYPE=OOS,
   ALTRTNR=723, GWIPADR=<ip_address_of_gw>, EXTNO=4;
  ```

  In the node, to which the alternate routing on error points, following administrations have to be done:

  It is necessary to install a relation between subscriber and XPRESSION. In this case, the subscriber is that number with what the HFA subscriber from the node with the XPRESSION is logged on in the alternate node.

  ```
  CREATE-RICHT:MODE=PM,IDX=1, SAN=nnnnn, NAME=PHONEMAIL;
  CHANGE-SBCSU: STNO=4711, PMIDX=1;
  ```

  Interdependencies with other Requests:

  Alternate routing on error for MWI uses the functionality of common Alternate routing on error for HFA phone, that can change its logon location in case of IP quality problems (loss of LAN connection etc.) This means, that this feature only can be used, if the basic Alternate routing on error works also fine.

5.2.2.5 Called subscribers (A,B) in its APs are in an APE situation to AP of the calling device

- Device configuration:

  number (subscriber_A) = 4711

  number (subscriber_B) = 4712

  subscriber A,B in same source group
- What are the main goals ?

  The main goal is, to reach the subscribers, that are in APE situation to the calling device, via public trunk loop in their own APs.

  Another goal may be, to reach the subscriber via its individual mobile phone number.

- What is possible ?

  All other alternate routing destination numbers, that lead to a valid internal or external phone number, are possible.

  The alternate routing destination number can be designed as outgoing public trunk access or tie trunk access followed by an incoming trunk access to reach an AP. In case of a partly routing via public trunk, in order to avoid possible loops in public network, it would be a good option to enlarge the alternate routing destination number with that number, that will be evaluated in the target OpenScape 4000 switch to the result "ALTRTAPE"

  The alternate routing destination number can be designed as a subscriber individual alternate routing number or as a source group related incomplete alternate routing number (with supplementation request).

  If the alternate routing destination number is designed as a source group related incomplete number, the supplementation can only be done with the identical subscribers extension number (parameter EXTNO = length of subscribers extension number).

  If the alternate routing destination number leads to a outgoing trunk access, only those route elements will be used for alternate routing, that are defined as with " no internal rerouting ".
- What You want is: Calls subscribers A,B, that are in an APE situation to the calling device, should be routed to the called subscribers in its AP via public trunk loop.

  In case of APE, in the AP of the calling devices, it can not be verified, whether the called subscribers in their own AP are in a seizable situation or not. Therefore, it makes sense, to alternate route the call to the originally called subscribers in their own APs via public trunk loop. The incoming trunk at target AP, then can verify for sure the real state of the called subscribers.

  For type = APE, You have to administer either subscriber individual alternate routing numbers of type = APE for subscriber A and B or incomplete source group related alternate routing numbers of type = APE for the source group(s), the subscriber A,B are members of.

  If You are sure, You don't need different alternate routing destinations for type = OOS, You also can administer the mentioned alternate routing destination numbers for type = OOS for use of APE.

  An incomplete alternate routing destination number will be supplemented at time of usage with the extension number of the called subscriber A,B and with the administered length (parameter EXTNO). This makes it possible to reach individual subscribers in other switches.

  If You use subscriber individual alternate routing destination numbers, You have to administer a subscriber individual alternate number for the subscribers A and B with outgoing trunk access to public network (004989), with incoming trunk access to reach the OpenScape 4000 (723) and with the individual subscriber numbers of subscriber_A and subscriber_B. If You use the option for loop avoidance, You have to enlarge the alternate routing destination number with that digit string, that will be evaluated in the target OpenScape 4000 switch to the result 'ALTRTAPE" (99)

  ```
  AEND-SDAT:STANO=<no_subscriber_A>, TYP=DATA1,
   STNOOOS=<004989-723-(99)- 4711;
  ```

```
AEND-SDAT:STANO=<no_subscriber_B>, TYP=DATA1,
 STNOOOS=<004989-723-(99)-4712;
```

If You use only source group related incomplete alternate routing destination numbers, You have to administer the source group related alternate destination number with outgoing trunk access to public network (004989) and with incoming trunk access (723) to reach the AP of the called subscriber (A,B) in OpenScape 4000.

If You use the option for loop avoidance, You have to enlarge the alternate routing destination number with that digit string, that will be evaluated in the target OpenScape 4000 switch to the result 'ALTRTAPE" (99).

Furthermore, You must set the supplementary length (parameter EXTNO) to the length of the subscriber number in the OpenScape 4000, which is = 4. In this case, You must not use a different value for EXTNO than the length of the subscriber number of subscriber A or B.

```
ADD-APRT:TYP=ALTERR, SRCGRP=<srcgrp_subscriber_A,
 ALRTTYPE=APE, ALTRTNR=004989-723-(99), EXTNO=4;
```

- What You want is: Calls to not ready subscribers of source group 1, that are in an APE situation to the calling device, should be routed to the attendant console. Calls to not ready subscriber_A, of source group 1, that is in an APE situation to the calling device, should be routed to a subscriber individual mobile phone number.

  For type = APE, You must define a source group related complete alternate routing destination number for the source group = 1.

  ```
  ADD-APRT:TYP=ALTERR, SRCGRP=1, ALTRTYPE=APE,
   ALTRTNR=<no_melden>;
  ```

  For type = APE and for subscriber_A, You must set the subscriber individual alternate routing number to the individual mobile phone number.

  ```
  AEND-SDAT:STANO=<no_subscriber_A>, TYP=DATA1,
   STNOAPE=<0-0049-1712272123;
  ```

  If You are sure, You will not use different alternate routing destination numbers for OOS and APE situations, it may be enough to define only alternate routing destination numbers for the type = OOS.

  ```
  ADD-APRT:TYP=ALTERR, SRCGRP=1, ALRTTYPE=OOS,
   ALTRTNR=<no_melden>;
  AEND-SDAT:STANO=<no_subscriber_A>, TYP=DATA1,
   STNOOOS=<0-0049-1712272123;
  ```

5.2.3 Service Information

5.2.3.1 General plausibility information

The amo syntax checks cannot verify all implausible administered alternate routing informations.

The administrator therefore has to verify itself very careful, whether alternate routing destination numbers in networking leads to seizable destinations.

Even if implausible alternate routing data passes the amo syntax check, call processing will prevent system confusion like loops in switch or networking.

Unusable alternate routing destination numbers will be indicated by advisory outputs at usage time, if the related DIAGS switches are set.

5.2.3.2 Special restriction information

The AMO SDAT allows, to set the parameters UZHFAIP and AMOALTRT in parallel for HFA IP phones. Specially for this type of subscriber, the combination of this 2 parameters does not make sense, because a HFA IP phone, that is authorized for moving its logon location from OpenScape 4000 to OpenScape Business/HiPath 3000 in case of IP errors (UZHFAIP) must not request alternate routing, if manuel deactivated by amo (AMOALTRT).

The parameter AMOALTRT only makes sense for those HFA IP phones, that are not authorized for moving their logon location.

The related checks are performed only from call processing at time of execution.

5.2.4 Generation

Please refer to Section 22.2, "User interface".

5.2.5 Realization via A&S Tools: Screenshots and additional information

An adaptation of A&S is necessary and requested and will be handed in later.

5.2.5.1 Realization via AMO: AMO or AMO Batch

AMO	Feature Relevant Commands	Meaning
DIMSU	ADD - TEST - DISP	• Define the maximum number of subscriber individual alternate routing destination numbers

AMO	Feature Relevant Commands	Meaning
SDAT	CHANGE - DEL - DISP	• Administer the subscriber individual alternate routing destination number for OOS • Administer the subscriber individual alternate routing destination number for APE • Set the authorization to move the logon location for a HPA IP phone • Set the authorization for alternate routing on error, when deactivated by AMO
APRT	ADD - CHANGE - DEL - DISP	• Administer the source group related alternate routing destination number for OOS • Administer the source group related alternate routing number for APE • Administer the source group related gateway_IP address for OOS (move logon)
ACSU	ADD - CHANGE - DEL - DISP	• Administer the subscriber individual alternate routing destination for OOS • Administer the subscriber individual alternate routing destination number for APE • Set the authorization for alternate routing on error, when deactivated by AMO

5.2.6 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
DIMSU	ALTERR	d	Anzahl der teilnehmerindividuellen alternativen Routing Ziel-Nummern
	ALTERR	e	number of subscriber individual alternate routing destination numbers
SDAT	UZHFAIP	d	Berechtigung fuer Logon in OpenScape Business/HiPath 3000
	MVHFAIP	e	Authorization for move logon to OpenScape Business/HiPath 3000
	AMOALTRT	d	Berechtigung fuer alternatives Routing, falls mittels AMO deaktiviert

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	AMOALTRT	e	Authorization for alternate routing on error if manual deactivated by AMO
	TLNNUOOS	d	Teilnehmer individuelle alternative Routing Nummer fuer OOS
	STNOOOS	e	Subscriber individual alternate routing number for OOS
	TLNNUAPE	d	Teilnehmer individuelle alternative Routing Nummer fuer APE
	STNOAPE	e	Subscriber individual alternate routing number for APE
ACSU	AMOALTRT	d	Berechtigung fuer alternatives Routing, falls mittels AMO deaktiviert
	AMOALTRT	e	Authorization for alternate routing on error if manual deactivated by AMO
	TLNNUOOS	d	Teilnehmer individuelle alternative Routing Nummer fuer OOS
	STNOOOS	e	Subscriber individual alternate routing number for OOS
	TLNNUAPE	d	Teilnehmer individuelle alternative Rufnummer fuer APE
	STNOAPE	e	Subscriber individual alternate routing number for OOS
APRT	ALTERR	d	Typenausscheidung fuer den neuen Zweig Alternatives Routen im Fehlerfall
	ALTERR	e	Type definition for new brach = alternate routing on error
	ALTRTYPE	d	Typ des alternate Routings (OOS oder APE)
	ALTRTYPE	e	Typ of alternate routing (OOS or APE)
	ALTRTNR	d	Source Gruppe bezogene alternative Routing Nummber fuer OOS oder APE
	ALTRTNT	e	source group related alternate routing number for OOS or APE
	ERWANZ	d	Erweiterungsangabe zur alternative Routing Nummer fuer OOS oder APE

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	EXTNO	e	supplementation information for alternate routing number for OOS or APE
	GWIPADR	d	Gateway_IP Adresse fuer den Typ = OOS
	GWIPADR	e	Gateway_IP address for typ = OOS
COT	ARCF	d	Konvertiert Alternate Routing zu CFU im Fehlerfall
	ARCF	e	Convert alternate routing on error to CFU

5.2.7 Frequently Asked Questions (FAQs)

- **Question**: Why do we need ARoE and what does it do?
  - If a call is made to an unavailable (OOS or AP Emergency mode) station or a personal attendant console (AC), the call is routed to an alternate destination if this has been administered appropriately.
  - If a call to an attendant console group is made from an AP in AP Emergency mode, if an individual AC or an night station cannot be called, the call is routed to the HHS/AP where the AC is physically installed, if the source group = 0 has been administered appropriately.
  - If CCM paging or a page attempt is initiated from an AP in AP Emergency mode when CCM is unavailable (perhaps because it was configured in the HHS), the call can be routed to the relevant HHS/AP if the CCM source group can be administered.
- **Question**: In which scenarios is ARoE used?
  - For calls to stations or personal attendant consoles that are in "NOT_READY" mode.
  - For calls to attendant console groups for which there are no available consoles or night stations.
  - For CCM paging and page attempts when CCM is unavailable.

  The following different scenarios exist:

  1) The station/personal AC is in NOT_READY mode due to a device/module error.

  2) The station/personal AC is in NOT_READY mode because it was deactivated using an AMO command. Concurrently a privilege for ARoE is set by AMO command when the station/personal AC is deactivated.

  3) The station is an HFA_IP telephone with Move_ Logon privilege in NOT READY mode. It has deregistered from the OpenScape 4000 due to an

IP error and has registered to a backup node (OpenScape Business/ HiPath 3000).

4) The station/personal AC is in NOT READY mode because its access point (AP) which connects to the AP of the calling station is in AP Emergency (APE) mode.

5) The station is an HFA IP telephone and is inactive.

6) Due to AP Emergency, none of the AC group stations are available.

7) Due to AP Emergency, CCM paging and page attempts are not possible.

The NOT_READY scenarios 1, 2, 3 and 5 are classed as OOS while scenarios 4, 5 and 6 are classed as APE.

- **Question**: Which alternate numbers can be administered?
  - In principle, more alternate numbers can be administered for each implementation scenario than is practical. The syntax checks for the AMOs SDAT, ACSU and APRT are very rudimental.

    Call Processing checks the usability of the alternate numbers for the relevant call scenario much more precisely and rejects the number if necessary. For example, CP does not permit an internal station number to be used as an alternate phone number for HFA_IP Move_logoff/Logon.
- **Question**: Which alternate numbers are practical for each of the following implementation scenarios?

1) OOS due to device/module error:

Mobile number/paging number/attendant code/hunt group/etc.

2) OOS due to deactivation via AMO:

Mobile number/paging number/attendant code/hunt group/etc.

3) OOS due to logon of HFA IP telephones to an alternate node

An external phone number to the alternate node with the station number.

4) APE scenario between the caller and the called station.

A public network phone number with the station number.

5) An HFA IP telephone is inactive.

Mobile number/paging number/attendant code/hunt group/etc.

6) Due to AP Emergency, there are no attendant group devices available.

An external phone number to the HHS/AP where the AC is physically installed.

7) Due to AP Emergency, CCM paging and page attempts are not possible.

An external phone number to the HHS/AP where CCM is physically installed.

- **Question**: How are alternate phone numbers configured?
  - Station-specific alternate phone numbers can be configured for OOS and/ or APE using the AMO SDAT or ACSU.
  - Source-group (destination source group) related alternate phone numbers can be configured for OOS and/or APE using the AMO APRT.
- **Question**: Can the configuration of nonsensical phone numbers cause problems for the switching system?
  - The AMO syntax checks for administering the alternate phone numbers are very rudimental. Call Processing, however, checks the suggested alternate phone numbers carefully before executing ARoE and rejects all nonsensical numbers.

- **Question**: How often can a call be routed to an alternate destination?
  - ARoE in response to OOS should be performed once only internally and network-wide. After ARoE in response to APE, ARoE can be performed again for OOS.
- **Question**: How do calling and called parties know when ARoE has been performed?
  - The alternate routing is not displayed to the calling or the called party. However, a different number to that dialed is shown on the calling party's display. This is the alternate number.
- **Question:** Why are there station-specific alternate numbers and additional source group-relevant alternate numbers?
  - In principle, it should be possible to assign an individual phone number to each station for both OOS and APE. However, this is memory-intensive.

    If you can manage with a single alternate phone number for an entire source group, then it is sufficient to administer this number for the relevant source group using APRT instead of providing each station in the source group with the same individual alternate phone number.

    This number can be composed of a cascade of trunk access codes followed by a station number supplement.

    If both number variants are available, the station-specific alternate number is always used first. This procedure ensures that specific stations (VIPs) in a source group can be treated differently to the rest of the stations in that group.
- **Question**: What is supplementing?
  - If you administer the alternate number on a source group basis, you can configure the number so that it contains several trunk access codes that provide a loop to the called party AP via the public network. In this case, the actual station number is not part of the alternate number to be administered but is automatically added to the alternate number by Call Processing in accordance with the specifications for supplementing.

    The same procedure is applied to ARoE for CCM. In this case the CCM code is the alternate number to be administered and the station number is the part to be supplemented.

    It is also possible to define a supplement with fewer digits than the called party number. This is practical, for example, if the numbering scheme for the alternate node at which the HFA IP telephones registers in the event of an error, has a different station number length.

    If the number is to be supplemented with a number shorter than that of the station number, the corresponding section of the station number is truncated. With ARoE to CCM, the number is truncated from the right. In all other cases, it is truncated from the left.

- **Question**: Is there a means of avoiding loops in OpenScape 4000 or the public network?
  - Yes. This is performed automatically when ARoE is executed in an OpenScape 4000/HiPath 4000 network.
  - Yes. When ARoE is executed via the public network and the alternate number contains a supplement which produces a valid ARoE-relevant digit analysis result in the end node (ALTRTOOS/ ALTRTAPE).

  Note: This supplementary number should only be part of the alternate phone number if you have ensured that the digit analysis result has been configured.

  - Yes, if the gateway IP address of the alternate node was administered for the HFA IP telephones. In this case, the system checks if the call originated from the node to which alternate routing should be performed.
- **Question**: Is there anything in particular that must be observed when ARoE is configured for analog phonemail?
  - Yes. In order for the phonemail to play the correct announcement, it requires the phone number of the unavailable station. This is only possible by converting "ARoE to the phonemail" to "CFU to the phonemail". To do this, the following administration tasks must be performed: ADD-ZIEL: TYPE = EVMTAB, SZTYPE = FWD, CD = <no_phonemail>;
- **Question**: Is there anything in particular that must be observed when ARoE is configured for digital phonemail?
  - Yes. In order for the digital phonemail to play the correct announcement, it requires the phone number of the unavailable station. This is only possible by converting "ARoE to the phonemail" to "CFU to the phonemail".

    For trunks that are characterized by the COT parameter LRPM, this conversion is performed automatically when an outgoing line is seized.

    If the COT parameter **LRPM** is not set, the COT parameter **ARCF** should be set (see next question).
- **Question**: Are there other scenarios in which ARoE should be converted to CFU?
  - Yes, for carriers which do not permit calls whose calling number does not belong to the system to which the carrier is connected. In the case of ARoE, the carriers request a redirection number. Again, this is only possible by converting ARoE to CFU. To ensure automatic conversion while seizing an outgoing trunk line, the COT parameter **ARCF** must be set for the outgoing seized line.
- **Question**: Is ARoE performed for direct calls to a station in NOT_READY mode?
  - No, due to a device error or deactivation via AMO.
  - Yes, in response to log off/on of HFA IP telephones and APE.
- **Question**: Is ARoE performed if a console makes a consultation call to a station in NOT_READY mode?
  - That depends on the Zand setting. (ZAND / ATND /ACEXTWFT). If this flag is set, then yes.

- **Question**: Is ARoE performed if the destination Exec in an executive/ secretary configuration is in NOT_READY mode?
  - That depends on the status of the RNGXFER key.

    If the RNGXFER key is not pressed, then ARoE is only performed if the secretary is also in NOT_READY mode.

    If the RNGXFER key is pressed, ARoE is performed immediately.

    The alternate number must be configured for this for the executive and the executive source group.
- **Question**: Is ARoE performed for hotline after timeout on a station in NOT_READY mode?
  - Yes.
- **Question**: Is ARoE performed for a hotline call on a station in NOT_READY mode?
  - Yes.
- **Question**: Is ARoE performed if the destination is a hunt group member in NOT_READY mode?
  - No. In the case of hunt groups, no attempt is made to seize a member in NOT_READY mode. ARoE is therefore not performed.
- **Question**: Is ARoE performed for on-hook MCC paging when the paged party is in NOT_READY mode?
  - No, due to a device error or deactivation via AMO.
  - Yes, in response to the log off/on of HFA IP telephones and APE.
- **Question**: Is ARoE performed if, during third-party monitoring, the third party is in NOT_READY mode?
  - No, due to a device error or deactivation via AMO.
  - Yes, in response to log off/on of HFA IP telephones and APE. In the case of APE, the system checks that the alternate number actually contains the destination number. If the third party is a device in another node, ARoE is treated in the same way as for normal calls since there is no knowledge of the existence of remote third-party monitoring network-wide.
- **Question**: When performing ARoE, is an ITR check performed between the called party and the alternate destination (if this is a station)?
  - No. This type of test is purposely not performed.
- **Question**: Is there any interplay between ARoE and Call Forwarding?
  - YES in an AP Emergency scenario. If there is an AP Emergency between the calling station AP and the called station AP, it is assumed that the CF data for the destination in the calling station AP is not up to date. CF is therefore not performed if a valid number is available for ARoE for APE.

    If there are no valid numbers available for ARoE for APE, CF is performed with the aim of reaching an alternate destination.
- **Question**: Is there any interplay between ARoE and Trace?
  - Yes. In the diagnosis printouts, the number of the station that invoked ARoE is recorded as with call forwarding.

- **Question**: Are there any special requirements for LCR?
  - Yes, if the alternate number is an external number. In this case, only route elements that do not include internal reroutes are accepted.

    The caller's LCR class-of-service is upgraded. ZAND / LCR/ LCRCOSUP
- **Question**: Is ARoE performed for Call Forwarding - No Reply after a Timeout?
  - No, not for general CFNR.
  - Yes, for quick CFNR on a station in NOT_READY mode.
  - Yes, for individual night service on a station in NOT_READY mode.
- **Question**: Is AR0E activated for No Answer Recall?
  - No, not for normal No Answer Recall.
  - Yes, for No Answer Recall on a night station.
- **Question**: Is ARoE performed for calls to a phantom station (without physical connection) that is in NOT_READY mode?
  - No, not for APE.

    Since the deregistered station cannot be assigned a physical line, an AP Emergency cannot be determined.
  - Yes, for OOS. For example, if the station was deactivated via AMO command.

    The alternate number may be administered on a station-specific or source-group-specific basis. Because there is no physical connection (source group = 0), the alternate number is determined in this case using source group = 0.
- **Question**: Is ARoE performed for Callback, if the callback destination is in NOT_READY mode?
  - No. The callback entry is retained and can be executed once NOT_READY mode is quit.
- **Question**: Can the alternate numbers for OOS also be used for APE?
  - Yes, if alternate numbers are not already configured for APE or are unusable.

    This does not apply to HFA IP telephones, which are set for automatic logoff/logon in the event of an error.
- **Question**: Is ARoE performed in response to OOS for HFA IP telephones with Logoff/Logon functionality, if these devices were deactivated via AMO command?
  - No, since it must be assumed that in this scenario the HFA IP telephones are not registered to alternate nodes. This also applies if the COS for ARoE was set using the AMO SDAT.
- **Question**: What type of additional diagnosis can be performed to detect ARoE malfunctions?
  - If you set flag 7 using DIAGS in CC or CP2, advisory messages with diagnostic information are output in the case of incorrect administration or situation-dependent unusability.
- **Question**: Is ARoE performed for Autoset Relocate?
  - Yes, if the station is deregistered.
- **Question**: Who bears the costs if ARoE is performed via public trunks?
  - The costs are borne by the station, for which ARoE was performed.

- **Question**: Which number is being paged when suffix-dialing is performed after ARoE to CCM?
  - The number that appears on the caller's display is the number being paged. In other words, the alternate number.
- **Question**: Is there any interplay between ARoE and synchronized announcement?
  - The announcement type is selected on the basis of the ITR number of the dialed destination. In the case of call forwarding, the ITR of the first destination dialed is the announcement type. If ARoE is performed for the first station number dialed, the ITR for that station is used for selecting the announcement type.
- **Question**: Is ARoE performed when there are no available consoles or night stations?
  - If, for example, an attendant intercept is to be activated in an AP that is in AP Emergency mode and there are no physical consoles or night stations available in the AP, it is impractical to perform source-group-specific ARoE. If the call were to follow the alternate routing number assigned to the source group of the last checked night station, the call would end up at the AP where the night station is physically installed.

    Source group-independent routing is performed if an alternate routing number is administered for source group = 0 using the AMO APRT of the type APE. In this case, calls should generally be routed to the HHS.

    The solution is as follows:

    With this type of administration, the loop avoidance code for OOS must be included in the alternate routing number (ALTRTOOS).
- **Question**: Is ARoE performed if CCM is not available due to AP Emergency?
  - If, for example, a station configured in an AP that is in AP Emergency mode cannot reach CCM because it is configured in the HHS, ARoE is performed if the following conditions are fulfilled:
    - A source_group-based alternate routing number for the CCM source_group is configured as an incomplete number. The value of the extension number is irrelevant in this case as long as it is greater than 0.
    - The CCM code should not contain any special characters as these cannot be transported via the public exchange.

      Likewise, ARoE is performed if a station configured in an AP that is in AP Emergency mode wants to respond to a paging call from the CCM in HHS. The attendant code used here should also not contain any special characters.

      It is not possible to perform on-hook paging from an AP in AP Emergency mode.

- **Question**: Is there an administration tool for assisting in creating the alternate routing number?
  - Yes. Specially-authorized devices (auth_test_equipment) can dial the access code for ALTRTOOS or ALTRTAPE followed by the station number.

    If a valid alternate routing number is administered, it is this number that is called. If there is no valid alternate routing number, the station is called as normal.

    This method can also be used for attendant intercept calls with the attendant code. This applies to APE scenarios only (ALTRTAPE).
- **Question**: Are there other means of adjusting the ARoE GUI?
  - Yes. There is a range of default settings that can be inversed using customer-specific patches. These settings include:
    - The administered alternate numbers for OOS can also be used for alternate routing for APE if the alternate numbers administered for APE cannot be used for the scenario in question (**Default = TRUE**).
    - The administered alternate numbers for OOS may also be used for alternate routing for APE if no alternate numbers are administered for APE (**Default = TRUE**).
    - ARoE is only performed if the alternate destination is in READY mode (**Default = TRUE**). An alternate destination can only be accepted in NOT READY mode if no other alternate destinations are configured. Alternate routing is also performed if the alternate destination is a device in NOT READY status. The advantage of this is that the call forwarding configured for this device can be used in this case if necessary. In addition, ARoE is possible for OOS, if the current ARoR is an APE.
    - More thorough plausibility check of the alternate number (**Default = TRUE**).
    - For testing/configuration purposes, it is possible to activate ARoE for APE for calls to stations in NOT READY mode even if there is no Access Point Emergency between the calling and destination stations (**Default = FALSE**). Calls to stations in NOT READY mode are always classed as AP Emergency between the caller and the destination.
- **Question**: Is ARoE possible for SIP stations?

  Yes.

5.3 Analog Trunking USA

- First of all, tie traffic (see Section 23.1, "Tie Traffic Features") and CO traffic (see Section 23.2, "Central Office Features") is described.
- Special instructions follow regarding the DIT feature (dedicated inward trunking), automatic camp-on, trunk group overflow with rerouting, Connecting rela Dialtone from Central Office and the application and specimen configuration data of USA-specific modules (TMEMUS, TMDID, TMC16 and TMDNH).
- The ADD batches listed are to be understood as examples only and must be adapted on a customer-specific basis when necessary.

- For use in the U.S., some system initial settings has to be done. This settings are for the correct initialisation of country code, the differnt tones, the SIU-setting and the dialtone receiver

  German:
  ```
  AENDERN-ZAND:TYP=DATENALL,LANDKZ=K;

  AENDERN-ZAND:TYP=TOENE,SIU="0K",HZE="0K";

  AENDERN-ZAND:TYP=SIUXPER,PEGMFV=1;
  ```
  English:
  ```
  CHANGE-ZAND:TYPE=ALLDATA,CNTRYCD=K;

  CHANGE-ZAND:TYPE=TONES,SIU="0K",CP="0K";

  CHANGE-ZAND:TYPE=SIUXPER,LEVDTMF=1;
  ```

5.3.1 Tie Traffic Features

5.3.1.1 TMEMUS

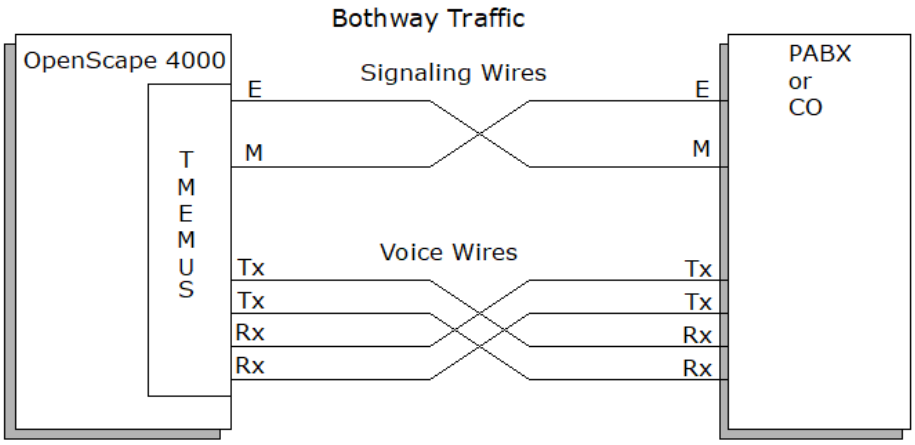
5.3.1.1.1 Feature Description

The TMEMUS circuit is a tie trunk circuit for incoming and outgoing traffic. The circuits can be operated with pulse dialing or DTMF dialing. Three protocols can be configured: Wink Start, Delay Start, Immediate. As a special-purpose configuration, the module can also be configured for Hoot & Holler application.

5.3.1.1.2 Service Information

- The use of the module is intended for tie trunks USA only.
- This module uses the DS102VA device handler
- The TMEMUS module uses no PTIME parameters; these are fixed in the Loadware.
- For test purposes, incoming and outgoing circuits can be connected to each other. In this context, they must be configured for the same protocol. No incoming circuit is required for Hoot and Holler; it is sufficient to connect a speaker and microphone.

5.3.1.1.3 Block Diagram



5.3.1.1.4 Protocols Used

Parameter description for the various protocols.

- EMD= Delay Dial
- EMW=Wink Dial
- EMI= Immediate Start (Dial Tone Start)
- EMH= Hoot & Holler

x= Parameter mandatory ; y= Parameter optional y*= If yes, both parameters must be set. n=forbidden

Protokoll	EMD	EMI	EMH	EMW
AMO-COP				
SACK - BELQ	x			
SDL - WABR	x			x
EOD - WEND				
ANS - MELD	x	x	x	x
LSUP-LUEW	n	n	n	n
SFRM- SFOR	x			x
NSDL-NOWA		x	x	
DTN - WTKB		y *		
DTT - WTON		y *		
NAAT-NAAT	x	x	x	x
DTMF-MFVW	y	y	y	y
DTM1-MFV1	y	y	y	y
BR64-IPVH	y	y	y	y

Protokoll	EMD	EMI	EMH	EMW
AMO-COT				
ANS - MVLT	x	x	x	x
RLC - AERF	y	y	y	y
NTON - KTON	y	y	y	y
NAAT - NAAT	x	x	x	x

5.3.1.1.5 Generation - Examples

- German

  1) Wink Start Protocol (EMW):

```
EINRICHTEN-BCSU:PER, 1, 2, 109, Q2469-X , , ;
EINRICHTEN-WABE:RNR=523, KZP=QUER, PRUEF=NEIN;

EINRICHTEN-BUEND:BUNUM=223, NAME="TMEMUS-EMW ", ANZ=4,
 RESERV=N, ANZFANG=0,
ANZACD=*, PRIONUM=1, TDDRFLAG=ON, GDTRRGL=0,
 ACDPMGRP=0;

EINRICHTEN-COP:COPNU=223,
 COPPAR=IPVH&RALA&MELD&NAAT&UWZ1&WABR&SFOR&ZWZ1; /*
 Für Impulswahl */

EINRICHTEN-COP:COPNU=223,
 COPPAR=MFVW&MFV1&RALA&NAAT&WABR&SFOR&PVW1 /* FürMFV-
Wahl*

EINR-COT:COTNU=:223,
 COTPAR=AERF&KTON&MVLT&NAAT&STUE, , QS-EMW;

EINRICHTEN-COSSU:NEWCOS=220, ESBER=FBKW&QVKW&GEZ;

EINRICHTEN-TACSU:LAGE=1-1-97-0, COTNR=223, COPNR=223,
 WABE=0, VBZ=0, COS=220, LCOSS=1,
LCOSD=1, BUNR=223, COFIDX=0, SATZNR="TMEMUS-EMW ",
 ZLNR=0, ALARMNR=2, CARRIER=1, ZONE=LEER,
LIN=0, CIDDGTS=KEINE, CBMATTR=KEINE, SRCGRP=1,
 CLASSMRK=EC&G711, TCCID=" ", DITIDX=0,
TRTBL=GDTR, RULEIDX=0, ATNTYP=COLOW, INBETR=J,
 GERTYP=QS, GER=EMW  ;

EINRICHTEN-RICHT:ART=LRTGNEU, LRTG=223, LDIENST=SPR,
 NAME="EMW ", BUNUM=223, ZKNNR=1-1-500,
REROUT=NEIN, ROUTATT=NEIN, EMCYRTT=NEIN, PZKNNR=1-1-0;

EINRICHTEN-LODR:LWR=2, LWREL=ECHOFELD, FELD=2;

EINRICHTEN-LDAT:LRTG=223,  LDIENST=SPR, LWERT=1,
 BUNUM=223, LWR=2, LBER=1, CARRIER=1,
ZONE=LEER, LATTR=KEINE,
```

2) Delay Dial Protocol (EMD):

```
EINRICHTEN-BCSU:PER, 1, 2, 109, Q2469-X , , ;

EINRICHTEN-WABE:RNR=523, KZP=QUER, PRUEF=NEIN;

EINRICHTEN-BUEND:BUNUM=223, NAME="TMEMUS-EMD ", ANZ=4,
 RESERV=N, ANZFANG=0, ANZACD=*,
PRIONUM=1, TDDRFLAG=ON, GDTRRGL=0, ACDPMGRP=0;

EINRICHTEN-COP:COPNU=223,
 COPPAR=IPVH&RALA&MELD&NAAT&UWZ1&WABR&BELQ&SFOR&ZWZ1;/
* Für Impulswahl */

EINRICHTEN-COP:COPNU=223,
 COPPAR=MFVW&MFV1&RALA&NAAT&WABR&BELQ&SFOR&PVW1/*
 FürMFV-Wahl*

EINR-COT:COTNU=:223,
 COTPAR=AERF&KTON&MVLT&NAAT&STUE, , QS-EMD;

EINRICHTEN-COSSU:NEWCOS=220, ESBER=FBKW&QVKW&GEZ;

EINRICHTEN-TACSU:LAGE=1-1-97-0, COTNR=223, COPNR=223,
 WABE=0, VBZ=0, COS=220, LCOSS=1, LCOSD=1,
BUNR=223, COFIDX=0, SATZNR="TMEMUS-EMD ", ZLNR=0,
 ALARMNR=2, CARRIER=1, ZONE=LEER, LIN=0,
CIDDGTS=KEINE, CBMATTR=KEINE, SRCGRP=1,
 CLASSMRK=EC&G711, TCCID=" ", DITIDX=0, TRTBL=GDTR,
RULEIDX=0, ATNTYP=COLOW, INBETR=J, GERTYP=QS,
 GER=EMD  ;

EINRICHTEN-RICHT:ART=LRTGNEU, LRTG=223, LDIENST=SPR,
 NAME="EMW ", BUNUM=223, ZKNNR=1-1-500,
REROUT=NEIN, ROUTATT=NEIN, EMCYRTT=NEIN, PZKNNR=1-1-0;

EINRICHTEN-LODR:LWR=2, LWREL=ECHOFELD, FELD=2;

EINRICHTEN-LDAT:LRTG=223, LDIENST=SPR, LWERT=1,
 BUNUM=223, LWR=2, LBER=1, CARRIER=1,
ZONE=LEER, LATTR=KEINE,
```

3) Immediate Start Protocol (EMI):

```
EINRICHTEN-BCSU:PER, 1, 2, 109, Q2469-X , , ;

EINRICHTEN-WABE:RNR=523, KZP=QUER, PRUEF=NEIN;

EINRICHTEN-BUEND:BUNUM=223, NAME="TMEMUS-EMI ", ANZ=4,
 RESERV=N, ANZFANG=0, ANZACD=*,
PRIONUM=1, TDDRFLAG=ON, GDTRRGL=0, ACDPMGRP=0;

EINRICHTEN-COP:COPNU=223,
 COPPAR=IPVH&RALA&MELD&NAAT&NOWA&UWZ1&ZWZ1;/* Für
 Impulswahl */
```

```
EINRICHTEN-COP:COPNU=223,
 COPPAR=MFVW&MFV1&RALA&NAAT&NOWA&PVW1/* Für MFV-Wahl*

EINR-COT:COTNU=:223,
 COTPAR=AERF&KTON&MVLT&NAAT&STUE, , QS-EMI;

EINRICHTEN-COSSU:NEWCOS=220, ESBER=FBKW&QVKW&GEZ;

EINRICHTEN-TACSU:LAGE=1-1-97-0, COTNR=223, COPNR=223,
 WABE=0, VBZ=0, COS=220, LCOSS=1,
LCOSD=1, BUNR=223, COFIDX=0, SATZNR="TMEMUS-EMI ",
 ZLNR=0, ALARMNR=2, CARRIER=1, ZONE=LEER,
LIN=0, CIDDGTS=KEINE, CBMATTR=KEINE, SRCGRP=1,
 CLASSMRK=EC&G711, TCCID=" ", DITIDX=0,
TRTBL=GDTR, RULEIDX=0, ATNTYP=COLOW, INBETR=J,
 GERTYP=QS, GER=EMI  ;

EINRICHTEN-RICHT:ART=LRTGNEU, LRTG=223, LDIENST=SPR,
 NAME="EMW ", BUNUM=223, ZKNNR=1-1-500,
REROUT=NEIN, ROUTATT=NEIN, EMCYRTT=NEIN,
 PZKNNR=1-1-0;

EINRICHTEN-LODR:LWR=2, LWREL=ECHOFELD, FELD=2;
EINRICHTEN-LDAT:LRTG=223, LDIENST=SPR, LWERT=1,
 BUNUM=223, LWR=2, LBER=1, CARRIER=1,
ZONE=LEER, LATTR=KEINE,
```

4) Hoot & Holler Protocol (EMH):

```
EINRICHTEN-BCSU:PER, 1, 2, 109, Q2469-X , , ;

EINRICHTEN-WABE:RNR=523, KZP=QUER, PRUEF=NEIN;

EINRICHTEN-BUEND:BUNUM=223, NAME="TMEMUS-EMH ", ANZ=4,
 RESERV=N, ANZFANG=0, ANZACD=*,
PRIONUM=1, TDDRFLAG=ON, GDTRRGL=0, ACDPMGRP=0;

EINRICHTEN-COP:COPNU=223,
 COPPAR=IPVH&RALA&MELD&NAAT&UWZ1&NOWA&ZWZ1;/* Für
 Impulswahl */

EINRICHTEN-COP:COPNU=223,
 COPPAR=MFVW&MFV1&RALA&NAAT&NOWA&PVW1/* Für MFV-Wahl*

EINR-COT:COTNU=:223,
 COTPAR=AERF&KTON&MVLT&NAAT&STUE, , QS-EMI;

EINRICHTEN-COSSU:NEWCOS=220, ESBER=FBKW&QVKW&GEZ;

EINRICHTEN-TACSU:LAGE=1-1-97-0, COTNR=223, COPNR=223,
 WABE=0, VBZ=0, COS=220, LCOSS=1,
LCOSD=1, BUNR=223, COFIDX=0, SATZNR="TMEMUS-EMH",
 ZLNR=0, ALARMNR=2, CARRIER=1, ZONE=LEER,
LIN=0, CIDDGTS=KEINE, CBMATTR=KEINE, SRCGRP=1,
 CLASSMRK=EC&G711, TCCID=" ", DITIDX=0,
TRTBL=GDTR, RULEIDX=0, ATNTYP=COLOW, INBETR=J,
 GERTYP=QS, GER=EMH ;
```

```
EINRICHTEN-RICHT:ART=LRTGNEU, LRTG=223, LDIENST=SPR,
 NAME="EMW ", BUNUM=223, ZKNNR=1-1-500,
REROUT=NEIN, ROUTATT=NEIN, EMCYRTT=NEIN, PZKNNR=1-1-0;

EINRICHTEN-LODR:LWR=2, LWREL=ECHOFELD, FELD=2;

EINRICHTEN-LDAT:LRTG=223, LDIENST=SPR, LWERT=1,
 BUNUM=223, LWR=2, LBER=1, CARRIER=1,
ZONE=LEER, LATTR=KEINE;
```

- English

  1) Wink Start Protocol (EMW):

```
ADD-BCSU:MTYPE=PER, LTG=1, LTU=2, SLOT=109,
 PARTNO="Q2469-X ", FCTID=0,
LWVAR="K", HWYBDL=A;

ADD-WABE:CD=542, DAR=TIE, CHECK=N;

ADD-BUEND:TGRP=242, NAME="TMUS-WINK ", NO=4, RSV=N,
 TRACENO=0, ACDTHRH=*,
PRIONO=2, TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0;

ADD-COP:COPNO=242,
 PAR=SDL&ANS&SFRM&RLSA&BR64&NAAT&TIM1&IDP1, TRK=TA,
 TOLL=TA;    /*For DP dialing*/

CHANGE-COP:COPNO=242, COPTYPE=COPADD, DEV=INDEP,
 INFO="QS-EMW-DP";

ADD-COP:COPNO=242,
 PAR=SDL&ANS&SFRM&RLSA&DTMF&DTM1NAAT&TIM1&PDP1,
 TRK=TA, TOLL=TA;    /*For DTMF dialing*/

CHANGE-COP:COPNO=242, COPTYPE=COPADD, DEV=INDEP,
 INFO="QS-EMW-DTMF";

ADD-COT:COTNO=242, PAR=RCL&ANS&IEVT&NAAT&NTON; CHANGE-
COT:COTNO=242, COTTYPE=COTADD,
DEV=INDEP, INFO="QS-EMW-IWV";

ADD-COSSU:NEWCOS=220, AVCE=TA&TNOTCR&CDRC;

ADD-TACSU:PEN=1-2-109-1, COTNO=242, COPNO=242, DPLN=0,
 ITR=0, COS=220, LCOSV=1, LCOSD=1,
TGRP=243, COFIDX=0CCT="QS-EMW ", DESTNO=0, ALARMNO=0,
 CARRIER=1, ZONE=EMPTY, LIN=0,
CIDDGTS=NONE, CBMATTR=NONE, SRCGRP=1,
 CLASSMRK=EC&G711, TCCID=" ", DITIDX=0, TRTBL=GDTR,
RULEIDX=0, ATNTYP=TIE, INS=Y, DEVTYPE=TT, DEV=EMW;

ADD-RICHT:LRTENEW, 242, VCE, "TMEMUS WINK ",  242,
 1-1-500, ,
NO,  , , "", , , , , , NO,  , NO, "", 1-1-0;
```

```
ADD-LODR:ODR=2, CMD=ECHO, FIELD=2; ADD-LODR:ODR=2,
 CMD=END;

ADD-LODR:ODR=2, INFO="TMEMUS";

ADD-LDAT:LROUTE=242, LSVC=VCE, LVAL=1, TGRP=242,
 ODR=2, LAUTH=1, CARRIER=1,
ZONE=EMPTY, LATTR=NONE, DNNO=5, VCCYC=4;

ADD-LDPLN:LDP="542"-"X", LROUTE=242, LAUTH=1, SPC=22,
 PINDP=N;
```

2) Delay Dial Protocol (EMD):

```
ADD-BCSU:MTYPE=PER, LTG=1, LTU=2, SLOT=109,
 PARTNO="Q2469-X ", FCTID=0,
LWVAR="K", HWYBDL=A;

ADD-WABE:CD=542, DAR=TIE, CHECK=N;

ADD-BUEND:TGRP=242, NAME="TMUS-WINK ", NO=4, RSV=N,
 TRACENO=0, ACDTHRH=*, PRIONO=2,
TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0;

ADD-COP:COPNO=242,
 PAR=SACK&SDL&ANS&SFORL&RLSA&BR64&NAAT&TIM1&IDP1,
 TRK=TA, TOLL=TA;    /*For DP dialing*/

CHANGE-COP:COPNO=242, COPTYPE=COPADD, DEV=INDEP,
 INFO="QS-EMD-DP";

ADD-COP:COPNO=242,
 PAR=SACK&SDL&ANS&SFOR&RLSA&DTMF&DTM1NAAT&TIM1&PDP1,
 TRK=TA, TOLL=TA;    /*For DTMF dialing*/

CHANGE-COP:COPNO=242, COPTYPE=COPADD, DEV=INDEP,
 INFO="QS-EMD-DTMF";

ADD-COT:COTNO=242, PAR=RCL&ANS&IEVT&NAAT&NTON; CHANGE-
COT:COTNO=242, COTTYPE=COTADD,
DEV=INDEP, INFO="QS-EMD";

ADD-COSSU:NEWCOS=220, AVCE=TA&TNOTCR&CDRC;

ADD-TACSU:PEN=1-2-109-1, COTNO=242, COPNO=242, DPLN=0,
 ITR=0, COS=220, LCOSV=1, LCOSD=1,
TGRP=243, COFIDX=0, CCT="QS-EMW ", DESTNO=0,
 ALARMNO=0, CARRIER=1, ZONE=EMPTY, LIN=0,
CIDDGTS=NONE, CBMATTR=NONE, SRCGRP=1,
 CLASSMRK=EC&G711, TCCID=" ", DITIDX=0, TRTBL=GDTR,
RULEIDX=0, ATNTYP=TIE, INS=Y, DEVTYPE=TT, DEV=EMD;

ADD-RICHT:LRTENEW, 242, VCE, "TMEMUS WINK ",  242,
 1-1-500, ,
NO,  , , "", , , , , , NO,  , NO, "", 1-1-0;
```

```
ADD-LODR:ODR=2, CMD=ECHO, FIELD=2; ADD-LODR:ODR=2,
 CMD=END; ADD-LODR:ODR=2, INFO="TMEMUS";

ADD-LDAT:LROUTE=242, LSVC=VCE, LVAL=1, TGRP=242,
 ODR=2, LAUTH=1, CARRIER=1, ZONE=EMPTY,
LATTR=NONE, DNNO=5, VCCYC=4;

ADD-LDPLN:LDP="542"-"X", LROUTE=242, LAUTH=1, SPC=22,
 PINDP=N;
```

3) Immediate Start Protocol (EMI):

```
ADD-BCSU:MTYPE=PER, LTG=1, LTU=2, SLOT=109,
 PARTNO="Q2469-X ", FCTID=0,
LWVAR="K", HWYBDL=A;

ADD-WABE:CD=542, DAR=TIE, CHECK=N;

ADD-BUEND:TGRP=242, NAME="TMUS-WINK ", NO=4, RSV=N,
 TRACENO=0, ACDTHRH=*,
PRIONO=2, TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0;

ADD-COP:COPNO=242,
 PAR=ANS&RLSA&BR64&NAAT&NSDL&TIM1&IDP1, TRK=TA,
 TOLL=TA;    /*For DP dialing*/

CHANGE-COP:COPNO=242, COPTYPE=COPADD, DEV=INDEP,
 INFO="QS-EMI-DP";

ADD-COP:COPNO=242,
 PAR=ANS&RLSA&DTMF&DTM1&NSDL&NAAT&TIM1&PDP1, TRK=TA,
 TOLL=TA;    /*For DTMF dialing*/

CHANGE-COP:COPNO=242, COPTYPE=COPADD, DEV=INDEP,
 INFO="QS-EMI-DTMF";

ADD-COT:COTNO=242, PAR=RCL&ANS&IEVT&NAAT&NTON; CHANGE-
COT:COTNO=242,
COTTYPE=COTADD, DEV=INDEP, INFO="QS-EMI";

ADD-COSSU:NEWCOS=220, AVCE=TA&TNOTCR&CDRC;

ADD-TACSU:PEN=1-2-109-1, COTNO=242, COPNO=242, DPLN=0,
 ITR=0, COS=220, LCOSV=1,
LCOSD=1, TGRP=243, COFIDX=0, CCT="QS-EMI ", DESTNO=0,
 ALARMNO=0, CARRIER=1,
ZONE=EMPTY, LIN=0, CIDDGTS=NONE, CBMATTR=NONE,
 SRCGRP=1, CLASSMRK=EC&G711,
TCCID=" ", DITIDX=0, TRTBL=GDTR, RULEIDX=0,
 ATNTYP=TIE, INS=Y, DEVTYPE=TT, DEV=EMI;

ADD-RICHT:LRTENEW, 242, VCE, "TMEMUS IM ",  242,
 1-1-500, ,
NO,  , , "", , , , , , NO,  , NO, "", 1-1-0;

ADD-LODR:ODR=2, CMD=ECHO, FIELD=2; ADD-LODR:ODR=2,
 CMD=END;
```

```
ADD-LODR:ODR=2, INFO="TMEMUS";

ADD-LDAT:LROUTE=242, LSVC=VCE, LVAL=1, TGRP=242,
 ODR=2, LAUTH=1,
CARRIER=1, ZONE=EMPTY, LATTR=NONE, DNNO=5, VCCYC=4;

ADD-LDPLN:LDP="542"-"X", LROUTE=242, LAUTH=1, SPC=22,
 PINDP=N;
```

4) Hoot & Holler Protocol (EMH):

```
ADD-BCSU:MTYPE=PER, LTG=1, LTU=2, SLOT=109,
 PARTNO="Q2469-X ",
FCTID=0, LWVAR="K", HWYBDL=A;

ADD-WABE:CD=542, DAR=TIE, CHECK=N;

ADD-BUEND:TGRP=242, NAME="TMUS-HOOT ", NO=4, RSV=N,
 TRACENO=0,
ACDTHRH=*, PRIONO=2, TDDRFLAG=ON, GDTRRULE=0,
 ACDPMGRP=0;

ADD-COP:COPNO=242,
 PAR=SACK&SDL&ANS&SFRM&RLSA&BR64&NAAT&TIM1&IDP1,
 TRK=TA, TOLL=TA;    /*For DP dialing*/

CHANGE-COP:COPNO=242, COPTYPE=COPADD, DEV=INDEP,
 INFO="QS-EMH-DP";

ADD-COP:COPNO=242,
 PAR=SACK&SDL&ANS&SFRM&RLSA&DTMF&DTM1NAAT&TIM1&PDP1,
 TRK=TA, TOLL=TA;    /*For DTMF dialing*/

CHANGE-COP:COPNO=242, COPTYPE=COPADD, DEV=INDEP,
 INFO="QS-EMH-DTMF";

ADD-COT:COTNO=242, PAR=RCL&ANS&IEVT&NAAT&NTON; CHANGE-
COT:COTNO=242,
COTTYPE=COTADD, DEV=INDEP, INFO="QS-EMH";

ADD-COSSU:NEWCOS=220, AVCE=TA&TNOTCR&CDRC;

ADD-TACSU:PEN=1-2-109-1, COTNO=242, COPNO=242, DPLN=0,
 ITR=0, COS=220, LCOSV=1,
LCOSD=1, TGRP=243, COFIDX=0, CCT="QS-EMH ", DESTNO=0,
 ALARMNO=0, CARRIER=1,
ZONE=EMPTY, LIN=0, CIDDGTS=NONE, CBMATTR=NONE,
 SRCGRP=1, CLASSMRK=EC&G711,
TCCID=" ", DITIDX=0, TRTBL=GDTR, RULEIDX=0,
 ATNTYP=TIE, INS=Y, DEVTYPE=TT, DEV=EMH;

ADD-RICHT:LRTENEW, 242, VCE, "TMEMUS HOOT ",  242,
 1-1-500, ,
NO,  , , "", , , , , , NO,  , NO, "", 1-1-0;
```

```
ADD-LODR:ODR=2, CMD=ECHO, FIELD=2; ADD-LODR:ODR=2,
 CMD=END;

ADD-LODR:ODR=2, INFO="TMEMUS";

ADD-LDAT:LROUTE=242, LSVC=VCE, LVAL=1, TGRP=242,
 ODR=2, LAUTH=1,
CARRIER=1, ZONE=EMPTY, LATTR=NONE, DNNO=5, VCCYC=4;

ADD-LDPLN:LDP="542"-"X", LROUTE=242, LAUTH=1, SPC=22,
 PINDP=N;
```

5.3.1.1.6 Relevant AMOs

x = System-specific, w = optional, need not be entered

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
BCSU	TYP	PER	
	LTG	<x>	
	LTU	<x>	
	EBT	<X>	
	SACHNR	Q2469-x	
	FCTID	<w>	
	LWVAR	<w>	
	SATZANZ	<x>	
	AKTFC	<w>	
	STERM	<w>	
	LTERM	<w>	
	PTERMO	<w>	
	HWYBDL	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
BCSU	MTYPE	PER	
	LTG	<x>	
	LTU	<x>	
	SLOT	<x>	
	PARTNO	Q2469-x	
	FCTID	<w>	
	LWVAR	<w>	
	CIRCNT%	<w>	
	AKTFC	<w>	
	STERM	<w>	
	LTERM	<w>	
	PTERMO	<w>	
	HWYBDL	<w>	
WABE	RNR	<x>	->Kennzahlpunkt-QUER (nur für gehend relevant)
	WABE	<w>	
	VKS	<w>	
	KZP	QUER	
	PRUEF	<w>	
	RIW	<w>	
	RN2	<w>	
	VS2	<w>	
	RI2	<w>	
	ZLNR	<w>	
	ARN	<w>	
	CFREMVAR	<w>	
	CFREMSE	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
WABE	CD	<x>	
	DPLN	<w>	
	CPS	<w>	
	DAR	TIE	
	CHECK	<w>	
	CDDP	<w>	
	CD2	<w>	
	CPS2	<w>	
	CDDP2	<w>	
	DESTNO	<w>	
	ARN	<w>	
	CFREMVAR	<w>	
	CFREMSE	<w>	
COT	COTNU	<w>	Standartwerte werden angegeben, es sind aber Kundenindividuelle Werte wenn nötig einzusetzen. AERF: Ist zu setzen wenn UNPLAUSIBLE_EVENT registriert werden sollen KTON: generell für US-Trunks zu setzen
	COTPAR	MVLT	
	GER	AERF	
	INFO	STUE	
		KTON	
		NAAT	
		<w>	
		<w>	
COT	COTNO	<w>	IEVT: Is only to set if UNPLAUSIBLE_EVENT errors should be registried NTON: set for all US-Trunks genrally
	PAR	ANS	
	DEV	RCL	
	INFO	IEVT	
		NTON	
		NAAT	
		<w>	
		<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COP	COPNU COPPAR BERAMT BERFERN GER INFO	<w> MFVW MFV1 BELQ WEND WABR LUEW IPVH NAAT WTON WTKB SFOR RALA MELD ZWZ1 UWZ1 PVW1 <w> <w> <w> >w>	Die COP-Parameter sind für das gewünschte Protokoll einzustellen (siehe Section 23.1.1.4, "Protocols Used", on page 190), es sind nur Standartwerte angegeben, Kundenindividuelle Werte sind wenn nötig zusätzlich zu setzen MFVW: MFV-Wahl MFV1: MFV-Wahl IPVH: Impulswahl WTON:Der Parameter ist beim EMI Protocol mit Warten auf Wählton zu setzen WTBK: Der Parameter ist beim EMI Protocol mit Warten auf Wählton zu setzen

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COP	COPNO PAR TRK TOLL DEV INFO	<w> DTMF DTM1 SACK EOD SDL LSUP BR64 NAAT DTT DTN SFRM RLSA ANS IDP1 TIM1 PDP1 <w> <w> <w> <w>	For COP-Parameters see Protocoll description Section 23.1.1.4, "Protocols Used", on page 190, only Standartvalues are described, Customerindividuek Values are to set if necessary DTMF: ForDTMF Dial DTM1: For DTMF Dialing BR64: For PulseDialing DTT: Set this Parameter if waiting for Dial-tone is necessary DTN: Set this Parameter if waiting for Dial-tone is necessary
COSSU	COPYCOS NEWCOS ESBER	<w> <w> <x>	ESBER: Kundenindividuelle Parameter sind zu setzen
COSSU	COPYCOS NEWCOS AVCE	<w> <w> <x>	AVCE: Paramters to set as Customer requirements

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
BUEND	BUNUM	<w>	ANZ: maximale Zahl zuzuordnender Sätze
	NAME	<w>	
	ANZ	<w>	
	RESERV	<w>	
	ANZFANG	<w>	
	ANZACD	<w>	
	PRIONUM	<w>	
	TDDRFLAG	<w>	
	GDTRRGL	<w>	
	ACDPMGRP	<w>	
BUEND	TGRP	<w>	only for outgoing Trunks necessary
	NAME	<w>	NO: maximum number of trunks
	NO	<w>	
	RSV	<w>	
	TRACENO	<w>	
	ACDTHRH	<w>	
	PRIONO	<w>	
	TDDRFLAG	<w>	
	GDTRULE	<w>	
	ACDPMGRD	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
TACSU	LAGE	<x>	DITIDX : nur zu setzen mit COP-Parameter DIT und wenn AMO-HOTLN eingerichtet GER: Das Gerät ist für das entsprechende Protokoll einzustellen (EMW,EMD,EMI oder EMH) ZIVOQ1: Ziffernvoreinstellung nur zusammen mit COP-Parameter DITR und ohne DIT zu setzen
	ANZ	<x>	
	COTNR	<x>	
	COPNR	<x>	
	WABE	<w>	
	VBZ	<w>	
	COS	<x>	
	LCOSS	<x>	
	LCOSD	<x>	
	ENACHT	<w>	
	BUNR	<x>	
	COFIDX	<w>	
	SATZNR	<w>	
	ZLNR	<w>	
	KNNR	<w>	
	ALARMNR	<w>	
	CARRIER	<w>	
	ZONE	<w>	
	LIN	<w>	
	CIDDGTS	<w>	
	CBMATTR	<w>	
	SRCGRP	<w>	
	CLASSMARK	<w>	
	TCCID	<w>	
	DITIDX	<w>	
	UMWTAB	<w>	
	REGELIDX	<w<>	
	TREFTYP	<w>	
	INBETR	<w>	
	GERTYP	QS	
	GER	<x>	
	ZIVOQ1	<W>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
TACSU	PEN	<x>	DITIDX: Only set a Value =/ 0 if COT-Parameter DIT is set DEV: The Board is to generate for the corresponding Dev-Type (EMW,EMD,EMI or EMH)
	NO	<x>	
	COTNO	<x>	
	COPNO	<x>	
	DPLN	<w>	
	ITR	<w>	
	COS	<x>	
	LCOSV	<x>	
	LCOSD	<x>	
	INIGHT	<w>	
	TGRP	<x>	
	COFIDX	<w>	
	CCT	<w>	
	DESTNO	<w>	
	NNO	<w>	
	ALARMNO	<w>	
	CARRIER	<w>	
	ZONE	<w>	
	LIN	<w>	
	CIDDGTS	<w>	
	CBMATTR	<w>	
	SRCGRP	<w>	
	CLASSMRK	<w>	
	TCCID	<w>	
	DITIDX	<w>	
	TRTBL	<w>	
	RULEIDX	<w<>	
	ATNTYP	<w>	
	INS	<w>	
	DEVICETYP	TT	
	DEV	<x>	
	DIGITPTR1	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
DTIM1	ARTDH=QV	<w>	Standart Werte werden verwendet
	AUSLZ1	<w>	
	AUSLZ2	<w>	
	FERNSPQ	<w>	
	MFERNS	<w>	
	BELUEW	<w>	
	PAUWAHL	<w>	
	BTBUEGEG	<w>	
	FREIGAB1	<w>	
	FREIGAB2	<w>	
	FREIGAB3	<w>	
	FREIGAB4	<w>	
	FREIGAB5	<w>	
	BELVER	<w>	
	EMPFUEW	<w>	
	PRUEF1	<w>	
	PRUEF2	<w>	
	GLTAPR1	<w>	
	GLTAPR2	<w>	
	GLTAPR3	<w>	
	RESTRTNA		

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
DTIM1	TYPEDH=TIE	<w>	Default values will be used
	RLSC1	<w>	
	RLSC2	<w>	
	BTSUPV	<w>	
	REMBLKAC	<w>	
	SZUPV	<w>	
	PAUDIAL	<w>	
	RESET1	<w>	
	RESET2	<w>	
	RESET3	<w>	
	RESET4	<w>	
	RESET5	<w>	
	SZAT	<w>	
	RLSSUPV	<w>	
	TEST1	<w>	
	TEST2	<w>	
	CTLSTST1	<w>	
	CTLSTST2	<w>	
	CTLSTST3	<w>	
	RESTRTNA		

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
DTIM2	ARTDH=SATZALLG ARTDH=ALLG	WABUEBZ1 WABUEBZ2 WABUEBZ3 WABUEBZ4 PAUVWA1 PAUVWA2 PAUVWA3 PAUVWA4 ZWWAHLZ1 ZWWAHLZ2 ZWWAHLZ3 ZWWAHLZ4 DTRANFO WEUEBZ WE1A WBSFS WAHLAUFN DELTIM1 DELTIM2 REQTIM1 REQTIM" TONZEIT WTONZT1 BTONZT1 QTONZT1 WAHLPAUZ NACHWALZ, UEBERNAZ CEANFOR EFREITON EANKLTON , EHILTON1> , EHILTON2 BTN1	Standart Werte werden verwendet

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
		BTN2 BTN3 STAFFELW BTONFANG NUTON OHDELAY1 PAUSDIAL CMPOBEEP	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
DTIM2	TYPEDH=LNGEN, TYPEDH=GEN	STADIAL1 STADIAL2 STADIAL3 STADIAL4 PDLY1 PDLY2 PDLY3 PDLY4 IDGT1 IDGT2 IDGT3 IDGT4 DTRFIND EOD EOD1A RESZBLK DIALSTA DELTIM1 DELTIM2 REQTIM1 REQTIM2 DTNT1 ANATN BSYON ACKTN1 DIALPAUT POSTDIAL FLSHSUPV CRFIND FRNGBK FCO FAUXTN1 FAUXTN2 BSGNL1 BSGNL2	Standart Values are used

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
		BSGNL3, CUTTHRUD BSIGCONN NUTONE OHDELAY1 PAUSDIAL CMPOBEEP	
CTIME	ARTSWU=TTIME	PREEMT NOANSCON NOCALLTR TRANSTOA REPSEIZ REPSZEND PRREQI PRREQC NEUVERB AUSJOIN	Standart Werte werden verwendet
CTIME	TYPESWU=TRK	PREEMT NOANSCON NOCALLTR ATNDTRNS RPTSZ RPTSZEND PRREQI PRREQC NEWCONN RELJOIN	Standart Values are used

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
RICHT	ART	LRTGNEU	nur für gehende Belegung relevant
	LRTG	<x>	MFVUMS: für MFV-Nachwahl zu setzen (FIX wenn keine spezielle Kennzahl gewählt werden muss)
	LDIENST	<w>	
	NAME	<w>	
	BUNUM	<x>	
	ZKNNR	<w>	
	ROUTOPT	<w>	
	REROUT	<w>	
	MFVUMS	<w>	
	MFVANZ	<w>	
	MFVTEXT	<w>	
	MFVPULS	<w>	
	VLVER	<w>	
	UMLVER	<w>	
	ZLNR	<w>	
	PIN	<w>	
	ROUTATT	<w>	
	EMCYRTT	<w>	
	INFO	<w>	
	PZKNNR	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
RICHT	MODE	LRTENEW	only for outgoing Trunks necessary
	LRTE	<x>	DTMFCNV: is to set for DTMF Postdialing (FIX to send all digits to the line)
	LSVC	<w>	
	NAME	<w>	
	TGRP	<x>	
	DNNO	<w>	
	ROUTOPT	<w>	
	REROUT	<w>	
	DTMFCNV	<w>	
	DTMFDISP	<w>	
	DTMFTEXT	<w>	
	DTMFPULS	<w>	
	PLB	<w>	
	FWDBL	<w>	
	DESTNO	<w>	
	PIN	<w>	
	ROUTATT	<w>	
	EMCYRTT	<w>	
	INFO	<w>	
	PDNNO;	<w>	
LODR			nur für gehende belegung relevant, siehe LCR-Einrichtungen
LODR			only for outgoing Trunks necessary, see LCR administration
LDAT			nur für gehende belegung relevant, siehe LCR-Einrichtungen
LDAT			only for outgoing Trunks necessary, see LCR administration
LDPLN			nur für gehende belegung relevant, siehe LCR-Einrichtungen
LDPLN			only for outgoing Trunks necessary, see LCR administration

5.3.1.2 TMDNH - T1BOS for TIE Lines

5.3.1.2.1 Feature Description

The TMDNH (T1BOS) module is used as a digital tie trunk circuit for incoming and outgoing traffic. The circuits can be operated with pulse dialing or DTMF dialing. Four protocols can be configured: Wink Start, Delay Start, Immediate Start and PLAR.

5.3.1.2.2 Service Information

- The module is intended for use in the USA only.
- When using the TMDNH (T1BOS) for tie trunks, the DS102VA device handler is used.
- Protocols used

Parameter description for the various protocols.

- T1EMD= Delay Dial
- T1EMW=Wink Dial
- T1EMI= Immediate Start
- T1PLAR= PLAR

x= Parameter mandatory ; y= Parameter optional, n=forbidden

Protokoll	T1EMD	T1EMI	T1EMW	T1PLAR
AMO-COP				
SACK - BELQ	x			
SDL - WABR	x		x	
EOD - WEND				
ANS - MELD	x	x	x	x
LSUP-LUEW	n	n	n	n
SFRM- SFOR	x		x	
NSDL-NOWA		x		x
DTN - WTKB	y	y	y	
DTT - WTON	y	y	y	y
NAAT-NAAT	x	x	x	x
DTMF-MFVW	y	y	y	y
DTM1-MFV1	y	y	y	y
BR64-IPVH	y	y	y	y

5.3.1.2.3 Generation

The generation example is given for a T1EMI with pulse dialing; for other signaling methods (T1EMW, T1EMD, T1PLAR and DTMF signaling), the COP parameters must be modified accordingly and the system configured correctly in AMO TACSU.

- German

```
AENDERN-LWPAR:TYP=TMD,  TMDTYP=TMDBOSBLNR=1,
 OPMODE=BDETON&BISUB80N&FRAMEESF&NETUSER,
CABLETYP=1, OESDISTH=30, OESREQTH=4, SESDISTH=10,
 SESREQTH=10;

AENDERN-LWPAR:TYP=TMD, TMDTYP=TMDBOSBLNR=2,
 OPMODE=BDETON&BISUB80N&FRAMEESF,
CABLETYP=1, OESDISTH=30, OESREQTH=4, SESDISTH=10,
 SESREQTH=10;

EINRICHTEN-BCSU:TYP=TMD, LTG=1, LTU=1, EBT=97,
 SACHNR="Q2192-X", FCTID=1,
LWVAR="K", LWPAR=2, HWYBDL=A;

EINRICHTEN-BCSU:TYP=TMD, LTG=1, LTU=2, EBT=109,
 SACHNR="Q2192-X", FCTID=1,
LWVAR="K", LWPAR=1, HWYBDL=A;

EINRICHTEN-BUEND:BUNUM=242, NAME="T1EMI", ANZ=2,
 RESERV=N, ANZFANG=0,
ANZACD=*, PRIONUM=2, TDDRFLAG=ON, GDTRRGL=0, ACDPMGRP=0;

EINRICHTEN-WABE:RNR=543, KZP=QUER, PRUEF=NEIN;

EINRICHTEN-COP:COPNU=242,
 COPPAR=MELD&RALA&IPVH&NAAT&UWZ1&NOWA&ZWZ1,
BERAMT=FBKW, BERFERN=FBKW;

AENDERN-COP:COPNU=242, COPART=COPZU, GER=UNAB, INFO="T1-
EMI";
EINRICHTEN-COT:COTNU=242,
 COTPAR=AERF&MVLT&STUE&NAAT&KTON;
AENDERN-COT:COTNU=242, COTART=COTZU, GER=UNAB, INFO="T1-
EMI";
EINRICHTEN-COSSU:NEWCOS=220, ESBER=FBKW&QVKW&GEZ;

EINRICHTEN-TACSU:LAGE=1-1-97-1, COTNR=242, COPNR=242,
 WABE=0, VBZ=0, COS=220,
LCOSS=1, LCOSD=1, BUNR=243, COFIDX=0, SATZNR="QSGUS-IM",
 ZLNR=0, ALARMNR=0,
CARRIER=1, ZONE=LEER, LIN=0, CIDDGTS=KEINE,
 CBMATTR=KEINE, SRCGRP=1,
CLASSMRK=EC&G711, TCCID=" ", DITIDX=0, TRTBL=GDTR,
 RULEIDX=0, ATNTYP=TIE,
INBETR=J, GERTYP=QS, GER=T1EMI;

EINRICHTEN-TACSU:LAGE=1-2-109-1, COTNR=242, COPNR=242,
 WABE=0, VBZ=0, COS=220,
LCOSS=1, LCOSD=1, BUNR=242, COFIDX=0, SATZNR="QSGUS-IM",
 ZLNR=0, ALARMNR=0,
CARRIER=1, ZONE=LEER, LIN=0, CIDDGTS=KEINE,
 CBMATTR=KEINE, SRCGRP=1,
CLASSMRK=EC&G711, TCCID=" ", DITIDX=0, TRTBL=GDTR,
 RULEIDX=0, ATNTYP=TIE, INBETR=J,
GERTYP=QS, GER=T1EMI;
```

```
EINRICHTEN-REFTA:TYP=SATZ, LAGE=1-1-97-0, PRIO=0,
 SPERRE=N, READYASY=N;
EINRICHTEN-REFTA:TYP=SATZ, LAGE=1-2-109-0, PRIO=0,
 SPERRE=N, READYASY=N;

EINRICHTEN-RICHT:ART=LRTGNEU, LRTG=242, LDIENST=SPR,
 NAME="T1EMI ", BUNUM=242,
ZKNNR=1-1-500, REROUT=NEIN, ROUTATT=NEIN, EMCYRTT=NEIN,
 PZKNNR=1-1-0;

EINRICHTEN-LDAT:LRTG=242, LDIENST=SPR, LWERT=1,
 BUNUM=242, LWR=2, LBER=1,
CARRIER=1, ZONE=LEER, LATTR=KEINE, ZKNNR=5, VCCYK=4;

EINRICHTEN-LODR:LWR=2, LWREL=ECHOFELD, FELD=2;
EINRICHTEN-LODR:LWR=2, LWREL=ENDE;
EINRICHTEN-LODR:LWR=2, INFO="QUER A3 OFFEN";
EINRICHTEN-LDPLN:LWM="543"-"X", LRTG=242, LBER=1,
 IPS=22, PINDP=NEIN;
```

- English

```
CHANGE-LWPAR:TYPE=TMD, TMDTYPE=TMDBOS, BLNO=1,
 OPMODE==BDETON&BISUB80N&FRAMEESF&NETUSER,
CABLETYP=1, OESDISTH=30, OESREQTH=4, SESDISTH=10,
 SESREQTH=10;

CHANGE-LWPAR:TYPE=TMD, TMDTYPE=TMDBOS, BLNO=2,
 OPMODE=BDETON&BISUB80N&FRAMEESF, CABLETYP=1,
OESDISTH=30, OESREQTH=4, SESDISTH=10, SESREQTH=10;

ADD-BCSU:MTYPE=TMD, LTG=1, LTU=1, SLOT=97,
 PARTNO="Q2192-X   ", FCTID=1, LWVAR="K",
LWPAR=2, HWYBDL=A;

ADD-BUEND:TGRP=242, NAME="T1EMI ", NO=2, RSV=N,
 TRACENO=0, ACDTHRH=*, PRIONO=2,
TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0;

ADD-WABE:CD=543, DAR=TIE, CHECK=N;
ADD-COP:COPNO=242,
 PAR=ANS&RLSA&BR64&NAAT&TIM1&NSDL&IDP1, TRK=TA, TOLL=TA;
CHANGE-COP:COPNO=242, COPTYPE=COPADD, DEV=INDEP,
 INFO="T1-EMI";
ADD-COT:COTNO=242, PAR=RCL&ANS&IEVT&NAAT&NTON;
CHANGE-COT:COTNO=242, COTTYPE=COTADD, DEV=INDEP,
 INFO="T1-EMI";
ADD-COSSU:NEWCOS=220, AVCE=TA&TNOTCR&CDRC;

ADD-TACSU:PEN=1-1-97-1, COTNO=242, COPNO=242, DPLN=0,
 ITR=0, COS=220, LCOSV=1, LCOSD=1,
TGRP=243, COFIDX=0, CCT="QSGUS-IM", DESTNO=0, ALARMNO=0,
 CARRIER=1, ZONE=EMPTY, LIN=0,
CIDDGTS=NONE, CBMATTR=NONE, SRCGRP=1, CLASSMRK=EC&G711,
 TCCID=" ", DITIDX=0, TRTBL=GDTR,
RULEIDX=0, ATNTYP=TIE, INS=Y, DEVTYPE=TT, DEV=T1EMI;
```

```
ADD-TACSU:PEN=1-2-109-1, COTNO=242, COPNO=242, DPLN=0,
 ITR=0, COS=220, LCOSV=1, LCOSD=1,
TGRP=242, COFIDX=0, CCT="QSGUS-IM    ", DESTNO=0,
 ALARMNO=0, CARRIER=1, ZONE=EMPTY, LIN=0,
CIDDGTS=NONE, CBMATTR=NONE, SRCGRP=1, CLASSMRK=EC&G711,
 TCCID=" ", DITIDX=0, TRTBL=GDTR,
RULEIDX=0, ATNTYP=TIE, INS=Y, DEVTYPE=TT, DEV=T1EMI;

ADD-REFTA:TYPE=CIRCUIT, PEN=1-1-97-0, PRI=0, BLOCK=N,
 READYASY=N;
ADD-REFTA:TYPE=CIRCUIT, PEN=1-2-109-0, PRI=0, BLOCK=N,
 READYASY=N;

ADD-RICHT:LRTENEW, 242, VCE, "T1EMI           ",
242, 1-1-500, , NO,  , , "", , , , , , NO, , NO, "",
 1-1-0;

ADD-LDAT:LROUTE=242, LSVC=VCE, LVAL=1, TGRP=242, ODR=2,
 LAUTH=1, CARRIER=1, ZONE=EMPTY,
LATTR=NONE, DNNO=5, VCCYC=4;

ADD-LODR:ODR=2, CMD=ECHO, FIELD=2;
ADD-LODR:ODR=2, CMD=END;
ADD-LODR:ODR=2, INFO="QUER A3 OFFEN";
ADD-LDPLN:LDP="543"-"X", LROUTE=242, LAUTH=1, SPC=22,
 PINDP=N;
```

5.3.1.2.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
LWPAR	TYP	TMD	->BLNR: Blocknummer frei zu vergeben später im BCSU einzutragen -> NETUSER: Für einen Trunk ist NETUSER zu setzen für die gegenseite nicht
	TMDTYP	TMDBOS	
	BLNR	<x>	
	OPMODE	BDETON	
	CABLETYP	BISUB8ON	
	OESDISTH	FRAMEESF	
	OESREQTH	NETUSER	
	SESDISTH	1	
	SESREQTH	30	
		4	
		10	
		10	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
LWPAR	TYPE TMDTYPE BLNO OPMODE CABLETYP OESDISTH OESREQTH SESDISTH SESREQTH	TMD TMDBOS <x> BDETON BISUB8ON FRAMEESF NETUSER 1 30 4 10 10	BLNO: Block-Number free later fill in in BCSU NETUSER: To set for one Trunk , not to set for partner Trunk
BCSU	TYP LTG LTU EBT SACHNR FCTID LWVAR LWPAR AKTFC STERM LTERM PTERM HWYBDL	TMD <x> <x> <x> Q2192-x 1 <x>	FCTID=1: Für BOS Anwendung LWPAR: Es ist die unter LWAR angegebene BLNR anzugeben

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
BCSU	MTYPE LTG LTU SLOT PARTNO FCTID LWVAR LWPAR ACTFC STERM LTERM PTERM HWYBDL	TMD <x> <x> <x> Q2192-x 1 <x>	FCTID=1: For BOS LWPAR: Set the Blocknumer (BLNO) definedwith LWPAR
WABE	KZP	QUER	Kennzahlpunkt-QUER (nur für gehend relevant)
WABE	DAR	TIE	Digit Anylis result=TIE (only necessary for outgoing)
COT	COTPAR	MVLT AERF STUE KTON NAAT	->STUE: Ist zu setzen wenn UNPLAUSIBLE_EVENT registriert werden sollen NAAT: für alle US-Trunks genrell zu setzen
COT	PAR	ANS RCL IEVT NTON NAAT	IEVT: Is only to set if UNPLAUSIBLE_EVENT errors should be registried NAAT: to set generally for all US-trunks

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COP	COPPAR	MFVW MFV1 BELQ WEND WABR LUEW IPVH NAAT SFOR RALA MELD ZWZ1 UWZ1 PVW1	Die COP-Parameter sind für das gewünschte Protocol einzustellen siehe Section 23.1.1.2, "Service Information", on page 189
COP	PAR	DTMF DTM1 SACK EOD SDL LSUP BR64 NAAT SFRM RLSA ANS IDP1 TIM1 PDP1	For COP-Parameters see Protocoll description Section 23.1.1.2, "Service Information", on page 189
COSSU	COPYCOS NEWCOS ESBER	<w> <w> <x>	ESBER: Kundenindividuelle Parameter sind zu setzen
COSSU	COPYCOS NEWCOS AVCE	<w> <w> <x>	AVCE: Paramters to set as Customer requirements

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
BUEND	BUNUM	<w>	ANZ: maximale Zahl zuzuordnender Sätze
	NAME	<w>	
	ANZ	<w>	
	RESERV	<w>	
	ANZFANG	<w>	
	ANZACD	<w>	
	PRIONUM	<w>	
	TDDRFLAG	<w>	
	GDTRRGL	<w>	
	ACDPMGRP	<w>	
BUEND	TGRP	<w>	only for outgoing Trunks necessary
	NAME	<w>	
	NO	<w>	
	RSV	<w>	
	TRACENO	<w>	
	ACDTHRH	<w>	
	PRIONO	<w>	
	TDDRFLAG	<w>	
	GDTRULE	<w>	
	ACDPMGRD	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
TACSU	LAGE	<x>	DITIDX: nur zu setzen mit COP-Parameter DIT und wenn AMO-HOTLN eingerichtet GER: Das Gerät ist für das entsprechende Prot.einzustellen (T1EMW,T1EMD,T1EMI oderT1PLAR) ZIVOQ1: Ziffernvoreinstellung nur zusammen mit COP-Parameter DITR und ohne DIT zu setzen
	ANZ	<x>	
	COTNR	<x>	
	COPNR	<x>	
	WABE	<w>	
	VBZ	<w>	
	COS	<x>	
	LCOSS	<x>	
	LCOSD	<x>	
	ENACHT	<w>	
	BUNR	<x>	
	COFIDX	<w>	
	SATZNR	<w>	
	ZLNR	<w>	
	KNNR	<w>	
	ALARMNR	<w>	
	CARRIER	<w>	
	ZONE	<w>	
	LIN	<w>	
	CIDDGTS	<w>	
	CBMATTR	<w>	
	SRCGRP	<w>	
	CLASSMARK	<w>	
	TCCID	<w>	
	DITIDX	<w>	
	UMWTAB	<w>	
	REGELIDX	<w<>	
	TREFTYP	<w>	
	INBETR	<w>	
	GERTYP	QS	
	GER	<x>	
	ZIVOQ1	<W>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
TACSU	PEN	<x>	DITIDX: Only set a Value =/ 0 if COT-Parameter DIT is set DEV: The Board is to generate for the corresponding Dev-Type (T1EMW,T1EMD,T1EMI or T1PLAR)
	NO	<x>	
	COTNO	<x>	
	COPNO	<x>	
	DPLN	<w>	
	ITR	<w>	
	COS	<x>	
	LCOSV	<x>	
	LCOSD	<x>	
	INIGHT	<w>	
	TGRP	<x>	
	COFIDX	<w>	
	CCT	<w>	
	DESTNO	<w>	
	NNO	<w>	
	ALARMNO	<w>	
	CARRIER	<w>	
	ZONE	<w>	
	LIN	<w>	
	CIDDGTS	<w>	
	CBMATTR	<w>	
	SRCGRP	<w>	
	CLASSMRK	<w>	
	TCCID	<w>	
	DITIDX	<w>	
	TRTBL	<w>	
	RULEIDX	<w<>	
	ATNTYP	<w>	
	INS	<w>	
	DEVICETYP	TT	
	DEV	<x>	
	DIGITPTR1	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
REFTA	TYP	SATZ	LAGE: Es is tLine Nr. 0 anzugebent
	LAGE	<x>	
	PRI	<x>	
	SPERRE	<x>	
	READYASY	<x>	
REFTA	TYPE	CIRCUIT	PEN: Give Line Nt. 0
	PEN	<x>	
	PRIO	<x>	
	BLOCK	<x>	
	READYASY	<x>	
RICHT	ART	LRTGNEU	nur für gehende Belegung relevant
	LRTG	<x>	MFVUMS: für MFV-Nachwahl zu setzen
	LDIENST	<w>	
	NAME	<w>	
	BUNUM	<x>	
	ZKNNR	<w>	
	ROUTOPT	<w>	
	REROUT	<w>	
	MFVUMS	<w>	
	MFVANZ	<w>	
	MFVTEXT	<w>	
	MFVPULS	<w>	
	VLVER	<w>	
	UMLVER	<w>	
	ZLNR	<w>	
	PIN	<w>	
	ROUTATT	<w>	
	EMCYRTT	<w>	
	INFO	<w>	
	PZKNNR	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
RICHT	MODE	LRTENEW	only for outgoing trunks necessary
	LRTE	<x>	DTMFCNV: is to set for DTMF Postdialing
	LSVC	<w>	
	NAME	<w>	
	TGRP	<x>	
	DNNO	<w>	
	ROUTOPT	<w>	
	REROUT	<w>	
	DTMFCNV	<w>	
	DTMFDISP	<w>	
	DTMFTEXT	<w>	
	DTMFPULS	<w>	
	PLB	<w>	
	FWDBL	<w>	
	DESTNO	<w>	
	PIN	<w>	
	ROUTATT	<w>	
	EMCYRTT	<w>	
	INFO	<w>	
	PDNNO;	<w>	
LODR			nur für gehende Belegung relevant, siehe LCR Administration
LODR			only fpr outgoing Trunks necessary, see LCR administration
LDAT			nur für gehende Belegung relevant,siehe LCR Administration
LDAT			only fpr outgoing Trunks necessary,see LCR administration
LDPLN			nur für gehende Belegung relevant,siehe LCR Administration
LDPLN			only fpr outgoing Trunks necessary, see LCR administration

5.3.2 Central Office Features

5.3.2.1 TMC16

5.3.2.1.1 Feature Description

The TMC16 is used for incoming (PSS call for switching) and outgoing (MSI) CO traffic. The module can be operated with Loop Start or Ground Start. Both pulse dialing or DTMF dialing is possible.

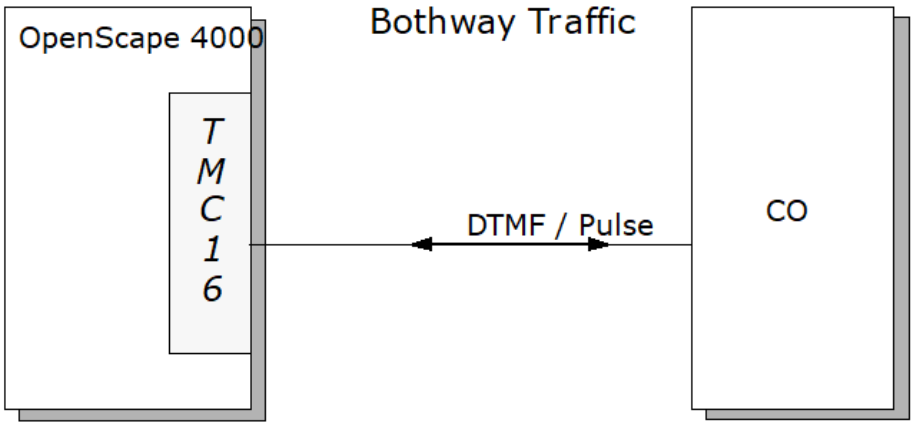
5.3.2.1.2 User Interface

An incoming CO call is signaled as an initial call during switching. In the case of an outgoing connection, the circuit is seized after selection of an Access-Code and the CO connection can be established. If it has been parameterized, you must wait for a tone from the CO.

5.3.2.1.3 Service Information

- The module is intended for use in the USA only. Configuration for Ground Start or Loop Start is based on the type of CO connected and also on whether the connected CO is operated with pulse dialing or DTMF dialing.
- If a call process tone from the CO is to be waited for in the case of an outgoing seizure, the COP parameter SDL must be set (a dial tone receiver is then switched in the outgoing circuit and the tone received from the CO is analyzed).
- If the CO does not transmit a seizure acknowledgement in the case of an outgoing connection (if provided for in the protocol), the CYCSET (DTIM1:CO) Timer in the OpenScape 4000 runs out first, followed by the STADIAL2 (DTIM2:LNGEN) Timer. Once the STADIAL2 Timer has expired, OUTGOING SEIZURE is attempted again. This sequence of timers and attempts at outgoing seizure is repeated infinitely until positive acknowledgement is received from the CO.
- DTMF post-dialing must be configured in AMO RICHT.
- In the case of an outgoing seizure, the circuits of the TMC16 must, in principle, be configured in such a way that the last digit is not transmitted until expiry of the WE1A timer (this is necessary as no answer is transmitted by the trunk and especially necessary in the case of Automatic Subscriber-Stations which report immediately upon dialing and subsequently expect DTMF post-dialing). If absolutely all digits are to be transmitted prior to expiry of the WE1A timer, the COP parameter NO1A (Without Signaling Method 1A) must be set in the circuit. Another possibility of completing dialing immediately is to complete the dialing with "#" , or to administrate the AMO LDPLN with "z" instead of "x" (the circuit is consequently not seized at all until after the final digit has been transmitted).
- The module uses the DS101VA device handler

5.3.2.1.4 Block Diagram



5.3.2.1.5 Generation Example

- German

  1) For Loop Start:

```
EINRICHTEN-BCSU:TYP=PER, LTG=1, LTU=1, EBT=097,
 SACHNR="Q2485-X", FCID=0, LWVAR="0";
EINRICHTEN-WABE:RNR=523, KZP=AMT, PRUEF=NEIN;

EINRICHTEN-BUEND:BUNUM=223, NAME="TMC16 ", ANZ=4,
 RESERV=N, ANZFANG=0, ANZACD=*,
PRIONUM=1, TDDRFLAG=ON, GDTRRGL=0, ACDPMGRP=0;

EINRICHTEN-COP:COPNU=223,
 COPPAR=IPVH&NAAT&UWZ1&NOWA&ZWZ1;/* Für Impulswahl */
EINRICHTEN-COP:COPNU=223,
 COPPAR=MFVW&MFV1&NAAT&NOWA&PVW1/* Für MFV-Wahl*
EINRICHTEN-COT:COTNU=223,
 COTPAR=AERF&LTVW&STUE&KGZL&NAAT&KTON;
EINRICHTEN-COSSU:NEWCOS=220, ESBER=FBKW&QVKW&GEZ;

EINRICHTEN-TACSU:LAGE=1-1-97-0, COTNR=223, COPNR=223,
 WABE=0, VBZ=0, COS=220,
LCOSS=1, LCOSD=1, BUNR=223, COFIDX=0, SATZNR="TMC16 ",
 ZLNR=0, ALARMNR=2, CARRIER=1,
ZONE=LEER, LIN=0, CIDDGTS=KEINE, CBMATTR=KEINE,
 SRCGRP=1, CLASSMRK=EC&G711, TCCID=" ",
DITIDX=0, TRTBL=GDTR, RULEIDX=0, ATNTYP=COLOW,
 INBETR=J, GERTYP=AS, GER=LPSTR, MFCVAR=0,
ANZUNT=0, ANZZIFF=0, PRUEFNR=1, CIRCIDX=2, GEB=1,
 SATZINFO=0, WAHLART=IWV-IWV, WAHLVAR=0-0,
COEX=0;

EINRICHTEN-RICHT:ART=LRTGNEU, LRTG=223, LDIENST=SPR,
 NAME="TMC16 ", BUNUM=223, ZKNNR=1-1-500,
REROUT=NEIN, ROUTATT=NEIN, EMCYRTT=NEIN, PZKNNR=1-1-0;

EINRICHTEN-LODR:LWR=2, LWREL=ECHOFELD, FELD=2;
```

```
EINRICHTEN-LDAT:LRTG=223, LDIENST=SPR, LWERT=1,
 BUNUM=223, LWR=2, LBER=1, CARRIER=1,
ZONE=LEER, LATTR=KEINE, VCCYK=4;

EINRICHTEN-LDPLN:LWM="523"-"X", LRTG=223, LBER=1,
 IPS=22, PINDP=NEIN;
```

2) For Ground Start:

```
EINRICHTEN-BCSU:TYP=PER, LTG=1, LTU=1, EBT=097,
 SACHNR="Q2485-X", FCID=0, LWVAR="0";
EINRICHTEN-WABE:RNR=523, KZP=AMT, PRUEF=NEIN;

EINRICHTEN-BUEND:BUNUM=223, NAME="TMC16 ", ANZ=4,
 RESERV=N, ANZFANG=0, ANZACD=*,
PRIONUM=1, TDDRFLAG=ON, GDTRRGL=0, ACDPMGRP=0;

EINRICHTEN-COP:COPNU=223,
 COPPAR=IPVH&NAAT&UWZ1&NOWA&ZWZ1;/* Für Impulswahl */
EINRICHTEN-COP:COPNU=223,
 COPPAR=MFVW&MFV1&NAAT&NOWA&PVW1/* Für MFV-Wahl*
EINRICHTEN-COT:COTNU=223,
 COTPAR=AERF&LTVW&STUE&KGZL&NAAT&KTON;
EINRICHTEN-COSSU:NEWCOS=220, ESBER=FBKW&QVKW&GEZ;

EINRICHTEN-TACSU:LAGE=1-1-97-0, COTNR=223, COPNR=223,
 WABE=0, VBZ=0, COS=220,
LCOSS=1, LCOSD=1, BUNR=223, COFIDX=0, SATZNR="TMC16 ",
 ZLNR=0, ALARMNR=2, CARRIER=1,
ZONE=LEER, LIN=0, CIDDGTS=KEINE, CBMATTR=KEINE,
 SRCGRP=1, CLASSMRK=EC&G711, TCCID=" ",
DITIDX=0, TRTBL=GDTR, RULEIDX=0, ATNTYP=COLOW,
 INBETR=J, GERTYP=AS, GER=GRDSTR, MFCVAR=0,
ANZUNT=0, ANZZIFF=0, PRUEFNR=1, CIRCIDX=2, GEB=1,
 SATZINFO=0, WAHLART=IWV-IWV, WAHLVAR=0-0, COEX=0;

EINRICHTEN-RICHT:ART=LRTGNEU, LRTG=223, LDIENST=SPR,
 NAME="TMC16 ", BUNUM=223, ZKNNR=1-1-500,
REROUT=NEIN, ROUTATT=NEIN, EMCYRTT=NEIN,
 PZKNNR=1-1-0;

EINRICHTEN-LODR:LWR=2, LWREL=ECHOFELD, FELD=2;

EINRICHTEN-LDAT:LRTG=223, LDIENST=SPR, LWERT=1,
 BUNUM=223, LWR=2, LBER=1, CARRIER=1,
ZONE=LEER, LATTR=KEINE, VCCYK=4;

EINRICHTEN-LDPLN:LWM="523"-"X", LRTG=223, LBER=1,
 IPS=22, PINDP=NEIN;
```

- English

1) Loop Start

```
ADD-BCSU:MTYPE=PER, LTG=1, LTU=1, SLOT=97,
 PARTNO="Q2485-X ", FCTID=0, LWVAR="0", HWYBDL=A;
```

```
ADD-BUEND:TGRP=223, NAME="TMC16 LOOP ", NO=4, RSV=N,
 TRACENO=0, ACDTHRH=*, PRIONO=1,
TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0; ADD-
COP:COPNO=223, PAR=BR64&NAAT&TIM1&NSDL&IDP1;

ADD-COT:COTNO=223, PAR=RCL&AEOD&IEVT&ICZL&NAAT&NTON;

ADD-COSSU:NEWCOS=220, AVCE=TA&TNOTCR&CDRC;

ADD-TACSU:PEN=1-1-97-0, COTNO=223, COPNO=223, DPLN=0,
 ITR=0, COS=220, LCOSV=1, LCOSD=1,
TGRP=223, COFIDX=0, CCT="TMC16 LOOP ", DESTNO=0,
 ALARMNO=2, CARRIER=1, ZONE=EMPTY, LIN=0,
 CIDDGTS=NONE,
CBMATTR=NONE, SRCGRP=1, CLASSMRK=EC&G711, TCCID="",
 DITIDX=0, TRTBL=GDTR, RULEIDX=0, ATNTYP=COLOW,
 INS=Y,
DEVTYPE=TC, DEV=LPSTR, MFCVAR=0, SUPPRESS=0, DGTCNT=0,
 TESTNO=1, CIRCIDX=3, CDRINT=1, CCTINFO=0,
DIALTYPE=DIP-DIP, DIALVAR=0-0, COEX=0; ADD-
RICHT:LRTENEW, 223, VCE, "TMC16 LOOP ",
223, 1-1-500, , NO,  , , "", , , , , , NO, , NO, "",
 1-1-0;

ADD-LODR:ODR=2, CMD=ECHO, FIELD=2; ADD-LODR:ODR=2,
 CMD=END;

ADD-LODR:ODR=2, INFO="TMC16"; ADD-LDAT:LROUTE=223,
 LSVC=VCE, LVAL=1, TGRP=223, ODR=2, LAUTH=1,
 CARRIER=1,
ZONE=EMPTY, LATTR=NONE, VCCYC=4;

ADD-LDPLN:LDP="523"-"X", LROUTE=223, LAUTH=1, SPC=22,
 PINDP=N;
```

2) Ground Start

```
ADD-BCSU:MTYPE=PER, LTG=1, LTU=1, SLOT=97,
 PARTNO="Q2485-X ", FCTID=0, LWVAR="0", HWYBDL=A;

ADD-BUEND:TGRP=223, NAME="TMC16GROUND ", NO=4, RSV=N,
 TRACENO=0, ACDTHRH=*, PRIONO=1,
TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0;

ADD-COP:COPNO=223, PAR=BR64&NAAT&TIM1&NSDL&IDP1;
ADD-COT:COTNO=223, PAR=RCL&AEOD&IEVT&ICZL&NAAT&NTON;
ADD-COSSU:NEWCOS=220, AVCE=TA&TNOTCR&CDRC;

ADD-TACSU:PEN=1-1-97-0, COTNO=223, COPNO=223, DPLN=0,
 ITR=0, COS=220, LCOSV=1, LCOSD=1,
TGRP=223, COFIDX=0, CCT="TMC16 GROUND ", DESTNO=0,
 ALARMNO=2, CARRIER=1, ZONE=EMPTY, LIN=0,
CIDDGTS=NONE, CBMATTR=NONE, SRCGRP=1,
 CLASSMRK=EC&G711, TCCID="", DITIDX=0, TRTBL=GDTR,
RULEIDX=0, ATNTYP=COLOW, INS=Y, DEVTYPE=TC,
 DEV=GRDSTR, MFCVAR=0, SUPPRESS=0, DGTCNT=0,
```

```
TESTNO=1, CIRCIDX=3, CDRINT=1, CCTINFO=0,
 DIALTYPE=DIP-DIP, DIALVAR=0-0, COEX=0;

ADD-RICHT:LRTENEW, 223, VCE, "TMC16 GROUND ",  223,
 1-1-500, , NO,  , , "", , , , , , NO, , NO, "",
 1-1-0;

ADD-LODR:ODR=2, CMD=ECHO, FIELD=2; ADD-LODR:ODR=2,
 CMD=END; ADD-LODR:ODR=2, INFO="TMC16";

ADD-LDAT:LROUTE=223, LSVC=VCE, LVAL=1, TGRP=223,
 ODR=2, LAUTH=1, CARRIER=1, ZONE=EMPTY,
LATTR=NONE, VCCYC=4;

ADD-LDPLN:LDP="523"-"X", LROUTE=223, LAUTH=1, SPC=22,
 PINDP=N;
```

5.3.2.1.6 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
DTIM1	ARTDH	AMTSVER WBSGEH WBSKOM AUFRICHT ZYKLAUFR PAUZWZIF FANGAM WANS1 DANS1 WANS2 DANS2 DITR PWABHKZ	WBSGEH: Belegunssperre gehend nach Ausloesen WBSKOM: Belegungssperre kommend nach Auslösen ZYKLAUFR: Zeit für erneutes Belegungsversuch zum Amt

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
DTIM1	TYPEDH	CO RESZO RESZI SETUPULS CYCSET DSUPVOP TRACCO WANN1 DANN1 WANN2 DANN2 DITR PEODMS	RESZO: outgoing reseize barring after an outgoing co call RESZI: outgoing reseize barring after an incoming co call CYCSET: cyclic setup of line alarms for pulse signaling systems

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
DTIM2	ARTDH	SATZALLG	WABUEBZ2: Prüfzeit ob AMT wieder bereit (nach Fehler beim Belegen des Amtes)
	ARTDH	WABUEBZ1	
		WABUEBZ2	
		WABUEBZ3	
		WABUEBZ4	
		PAUVWA1	
		PAUVWA2	
		PAUVWA3	
		PAUVWA4	
		ZWWAHLZ1	
		ZWWAHLZ2	
		ZWWAHLZ3	
		ZWWAHLZ4	
		DTRANFO	
		WEUEBZ	
		WE1A	
		WBSFS	
		WAHLAUFN	
		DELTIM1	
		DELTIM2	
		REQTIM1	
		REQTIM"	
		ALLG	
		TONZEIT WTONZT1	
		BTONZT1	
		QTONZT1	
		WAHLPAUZ	
		NACHWALZ	
		UEBERNAZ	
		CEANFOR	
		EFREITON	
		EANKLTON EHILTON1 EHILTON2	
		BTN1	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
		BTN2 BTN3 STAFFELW BTONFANG NUTON OHDELAY1 PAUSDIAL CMPOBEEP BTONZT1 CEANFOR	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
DTIM2	TYPEDH, TYPEDH	LNGEN STADIAL1 STADIAL2 STADIAL3 STADIAL4 PDLY1 PDLY2 PDLY3 PDLY4 IDGT1 IDGT2 IDGT3 IDGT4 DTRFIND EOD EOD1A RESZBLK DIALSTA DELTIM1 DELTIM2 REQTIM1 REQTIM2 GEN DTNT1 ANATN BSYON ACKTN1 DIALPAU POSTDIAL FLSHSUPV CRFIND FRNGBK FCO FAUXTN1 FAUXTN2	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
		BSGNL1 BSGNL2 BSGNL3 CUTTHRUD BSIGCONN NUTONE OHDELAY1 PAUSDIAL CMPOBEEP	
BCSU	TYP LTG LTU EBT SACHNR FCTID LWVAR HWYBDL	PER <x> <x> <x> Q2485-x	
BCSU	MTYPE LTG LTU SLOT PARTNO FCTID LWVAR HWYBDL	PER <x> <x> <x> Q2485-x	
WABE	KZP	AMT	Einrichten eines Kennzahlpunktes AMT
WABE	DAR	CO	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COP	COPPAR	IPVH NAAT UWZ1 NOWA ZWZ1 MFVW MFV1 PVW1	Für Impulswahl: IPVH&NAAT&UWZ1&NOWA&ZWZ1 Für MFV-Wahl:.MFVW&MFV1&NAAT&NOWA&PVW1
COP	PAR	DTMF DTM1 NSDL BR64 NAAT IDP1 TIM1 PDP1	DTMF: for DTMF. DTM1: for DTMF BR64: for DP PDP1: for DTMF
COT	COTPAR	AERF LTVW STUE KGZL KTON NAAT	KGZL: Für Anzeige von Unplausiblen Events NAAT: ist für US-Trunks genrell zu setzen
COT	PAR	RCL AEOD IEVT ICZL NTON NAAT	NAAT: has to be set genrally for US-trunks
COSSU	COPYCOS NEWCOS ESBER	<w> <w> <x>	ESBER: Kundenindividuelle Parameter sind zu setzen
COSSU	COPYCOS NEWCOS AVCE	<w> <w> <x>	AVCE: Paramters to set as Customer requirements

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
BUEND	BUNUM	<w>	ANZ: maximale Zahl zuzuordnender Sätze
	NAME	<w>	
	ANZ	<w>	
	RESERV	<w>	
	ANZFANG	<w>	
	ANZACD	<w>	
	PRIONUM	<w>	
	TDDRFLAG	<w>	
	GDTRRGL	<w>	
	ACDPMGRP	<w>	
BUEND	TGRP	<w>	only for outgoing Trunks necessary
	NAME	<w>	
	NO	<w>	
	RSV	<w>	
	TRACENO	<w>	
	ACDTHRH	<w>	
	PRIONO	<w>	
	TDDRFLAG	<w>	
	GDTRULE	<w>	
	ACDPMGRD	<w>	
PTIME			Standart Werte werden verewendet
PTIME			Standart values will be used

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
TACSU	LAGE	<x>	
	COTNR	<x>	
	COPNR	<x>	
	WABE	<w>	
	VBZ	<w>	
	COS	<w>	
	LCOSS	<x>	
	LCOSD	<x>	
	BUNR	<x>	
	COFIDX	<x>	
	SATZNR	<w>	
	ZLNR	<w>	
	ALARMNR	<w>	
	CARRIER	<w>	
	ZONE	<w>	
	LIN	<w>	
	CIDDGTS	<w>	
	CBMATTR	<w>	
	SRCGRP	<w>	
	CLASSMRK	<w>	
	TCCID	<w>	
	DITIDX	<w>	
	TRTBL	<w>	
	RULEIDX	<w>	
	ATNTYP	<w>	
	INBETR	<w>	
	GERTYP	AS	
	GER	LPSRT or GDSTR	
	MFCVAR	<w>	
	,ANZUNT	<w>	
	ANZZIFF	<w>	
	PRUEFNR	<w>	
	CIRCIDX	<w>	
	GEB	<w>	
	SATZINFO	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	WAHLART WAHLVAR COEX=	<w> IWV-IWV/ MFV-MFV <w> <w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
TACSU	PEN	<x>	
	COTNO	<x>	
	COPNO	<x>	
	DPLN	<w>	
	ITR	<w>	
	COS	<x>	
	LCOSV	<x>	
	LCOSD	<x>	
	TGRP	<x>	
	COFIDX	<w>	
	CCT	<w>	
	DESTNO	<w>	
	ALARMNO	<w>	
	CARRIER	<w>	
	ZONE	<w>	
	LIN	<w>	
	CIDDGTS	<w>	
	CBMATTR	<w>	
	SRCGRP	<w>	
	CLASSMRK	<w>	
	TCCID	<w>	
	DITIDX	<w>	
	TRTBL	<w>	
	RULEIDX	<w>	
	ATNTYP	<w>	
	INS	<w>	
	DEVTYPE	TC	
	DEV	LPSTR or GRDSTR	
	MFCVAR	<w>	
	SUPPRESS	<w>	
	,DGTCNT	<w>	
	TESTNO	<w>	
	CIRCIDX	<w>	
	CDRINT	<w>	
	CCTINFO	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	DIALTYPE	<w>	
	DIALVAR	<w>	
	COEX	<x>	
		<w>	
RICHT	ART	LRTGNEU	nur für gehende Belegung relevant
	LRTG	<x>	MFVUMS: für MFV-Nachwahl zu setzen
	LDIENST	<w>	
	NAME	<w>	
	BUNUM	<x>	
	ZKNNR	<w>	
	ROUTOPT	<w>	
	REROUT	<w>	
	MFVUMS	<w>	
	MFVANZ	<w>	
	MFVTEXT	<w>	
	MFVPULS	<w>	
	VLVER	<w>	
	UMLVER	<w>	
	ZLNR	<w>	
	PIN	<w>	
	ROUTATT	<w>	
	EMCYRTT	<w>	
	INFO	<w>	
	PZKNNR	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
RICHT	MODE	LRTENEW	only for outgoing Trunks necessary
	LRTE	<x>	DTMFCNV: is to set for DTMF Postdialing
	LSVC	<w>	
	NAME	<w>	
	TGRP	<x>	
	DNNO	<w>	
	ROUTOPT	<w>	
	REROUT	<w>	
	DTMFCNV	<w>	
	DTMFDISP	<w>	
	DTMFTEXT	<w>	
	DTMFPULS	<w>	
	PLB	<w>	
	FWDBL	<w>	
	DESTNO	<w>	
	PIN	<w>	
	ROUTATT	<w>	
	EMCYRTT	<w>	
	INFO	<w>	
	PDNNO;	<w>	
LODR			nur für gehende Belegung relevant, siehe LCR Administration
LODR			only fpr outgoing Trunks necessary, see LCR administration
LDAT			nur für gehende Belegung relevant, siehe LCR Administration
LDAT			only fpr outgoing Trunks necessary, see LCR administration
LDPLN			nur für gehende Belegung relevant, siehe LCR Administration
LDPLN			only fpr outgoing Trunks necessary, see LCR administration

5.3.2.2 TMDID

5.3.2.2.1 Feature Description

This circuit is used as a direct inward dialing (DiD) circuit in the USA. The following protocols are possible: Wink Start, Delay Start or Immediate Dialing. The module is only to be used for incoming traffic.

5.3.2.2.2 User Interface

The type of protocol is configured by means of various COP parameters.

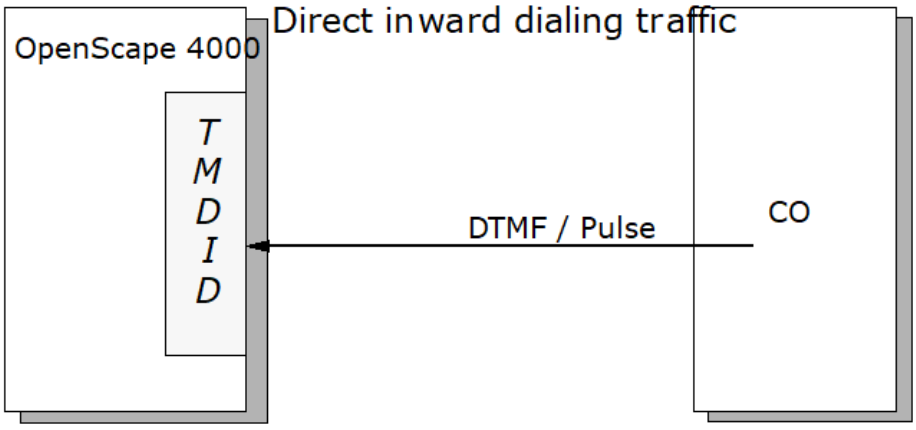
y = optional x= mandatory n= forbidden

Protokoll	Delay	Immediate	Wink
AMO-COP			
SACK - BELQ	n	n	x
SDL - WABR	x	n	x
NSDL-NOWA		x	
EOD - WEND	x	x	x
NAAT-NAAT	x	x	x
BR63-IPVH	y	y	y
DTMF-MFVW	y	y	y
DTM1-MFV1	y	y	y
LSUP-LUEW	n	n	n
PTIME-PTIME	P5=2	P5=2	P5=2

5.3.2.2.3 Service Information

- The module is intended for use in the USA only.
- The module uses the DS120VA,DS120VB,DS120VC device handlers

5.3.2.2.4 Block Diagram



5.3.2.2.5 Generation Example

The following protocols are envisaged:

1) Immediate Dial

2) Wink Start
3) Delay Dial

5.3.2.2.6 User Interface

The type of protocol is configured by means of various COP parameters.

y = optional x= mandatory n= forbidden

Protokoll	Delay	Immediate	Wink
AMO-COP			
SACK - BELQ	n	n	x
SDL - WABR	x	n	x
NSDL-NOWA		x	
EOD - WEND	x	x	x
NAAT-NAAT	x	x	x
BR63-IPVH	y	y	y
DTMF-MFVW	y	y	y
DTM1-MFV1	y	y	y
LSUP-LUEW	n	n	n
PTIME-PTIME	P5=2	P5=2	P5=2

5.3.2.2.7 Configuration Example:

- German

```
EINR-BCSU:PER, 1, 1, 97, Q2452-X, ;
KOP-PTIME:113, 2;AE-PTIME:REST, 2, PARA, , , , , 2;
EINRICHTEN-COP:COPNU=223,
 COPPAR=IPVH&RALA&RALB&NAAT&UWZ1&WABR&BELQ&ZWZ1;/* Für
 Impulswahl Prot. WINK*/
EINRICHTEN-COP:COPNU=223,
 COPPAR=MFVW&MFV1&RALA&RALB&NAAT&WABR&BELQ&PVW1/* Für
 MFV-Wahl Prot. WINK*
EINRICHTEN-COP:COPNU=223,
 COPPAR=IPVH&RALA&RALB&NAAT&UWZ1&WABR&ZWZ1;/* Für
 Impulswahl Prot. DELAY*/
EINRICHTEN-COP:COPNU=223,
 COPPAR=MFVW&MFV1&RALA&RALBNAAT&WABR&PVW1/* FürMFV-Wahl
 Prot. DELAY*
EINRICHTEN-COP:COPNU=223,
 COPPAR=IPVH&RALA&RALB&NAAT&UWZ1&NOWA&ZWZ1;/* Für
 Impulswahl Prot. IMMEDIATE*/
EINRICHTEN-COP:COPNU=223,
 COPPAR=MFVW&MFV1&RALA&RALB&NAAT&NOWA&PVW1/* Für MFV-
Wahl Prot.IMMEDIATE*
EINR-COT:COTNU=223, COTPAR=AERF&KTON&STUE&NAAT;
EINRICHTEN-COSSU:NEWCOS=220, ESBER=FBKW&QVKW&GEZ;
```

```
EINRICHTEN-TACSU:LAGE=1-1-97-0, COTNR=223, COPNR=223,
 WABE=0, VBZ=0, COS=220, LCOSS=1,
LCOSD=1, COFIDX=0, SATZNR="TMDID", ZLNR=0, ALARMNR=2,
 CARRIER=1, ZONE=LEER, LIN=0,
CIDDGTS=KEINE, CBMATTR=KEINE, SRCGRP=1,
 CLASSMRK=EC&G711, TCCID=" ", DITIDX=0, TRTBL=GDTR,
RULEIDX=0, ATNTYP=COLOW, INBETR=J, GERTYP=AS, GER=DID,
 MFCVAR=0, ANZUNT=0, ANZZIFF=0, PRUEFNR=1,
CIRCIDX=2, GEB=1, SATZINFO=0, WAHLART=IWV-IWV or MFV-
MFV, WAHLVAR=0-0, COEX=0;
```

- English

```
ADD-BCSU:MTYPE=PER, LTG=1, LTU=1, SLOT=97,
 PARTNO="Q2452-X   ", FCTID=0, LWVAR="0", HWYBDL=A;
COPY-PTIME:INIBLOCK=113, TBLK=3;
CHANGE-PTIME:TYPE=REST, TBLK=3, BTYPE=PARA, P5=2;
ADD-COP:COPNO=223, PAR=RLSB&RLSA&BR64&TIM1&NSDL&IDP1,
 TRK=TA, TOLL=TA; /* DP with IMMEDIATE Prot. */
ADD-COP:COPNO=223,
 PAR=RLSB&RLSA&BR64&TIM1&SACK&SDL&IDP1, TRK=TA,
 TOLL=TA; /* DP with WINK Prot. */
ADD-COP:COPNO=223, PAR=RLSB&RLSA&BR64&TIM1&SDL&IDP1,
 TRK=TA, TOLL=TA; /* DP with DELAY Prot. */
ADD-COP:COPNO=223,
 PAR=RLSB&RLSADTMF&DTM1&PDP1&TIM1&NSDL, TRK=TA,
 TOLL=TA; /*DTMF with IMMEDIATE Prot. */
ADD-COP:COPNO=223,
 PAR=RLSB&RLSA&DTMF&DTM1&PDP1&TIM1&SACK&SDL, TRK=TA,
 TOLL=TA; /*DTMF with WINK Prot. */
ADD-COP:COPNO=223,
 PAR=RLSB&RLSA&DTMF&DTM1&PDP1&TIM1&SDL, TRK=TA,
 TOLL=TA; /*DTMF with DELAY Prot. */
CHANGE-COP:COPNO=223, COPTYPE=COPADD, DEV=ANMOSIG,
 INFO="TMDID";
ADD-COT:COTNO=223, PAR=RCL&IEVT&NTON&NAAT;
ADD-COSSU:NEWCOS=220, AVCE=TA&TNOTCR&CDRC;

ADD-TACSU:PEN=1-1-97-0, COTNO=223, COPNO=223, DPLN=0,
 ITR=0, COS=220, LCOSV=1, LCOSD=1, TGRP=223,
COFIDX=0, CCT="DID USA IWV ", DESTNO=0, ALARMNO=2,
 CARRIER=1, ZONE=EMPTY, LIN=0, CIDDGTS=NONE,
CBMATTR=NONE, SRCGRP=1, CLASSMRK=EC&G711, TCCID="",
 DITIDX=0, TRTBL=GDTR, RULEIDX=0, ATNTYP=COLOW,
INS=Y, DEVTYPE=TC, DEV=DID, MFCVAR=0, SUPPRESS=0,
 DGTCNT=0, TESTNO=1, CIRCIDX=3, CDRINT=1, CCTINFO=0,
DIALTYPE=DIP-DIP, DIALVAR=0-0, COEX=0;
```

5.3.2.2.8 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
BCSU	TYP LTG LTU EBT SACHNR FCTID LWVAR HWYBDL	PER <x> <x> <x> Q2452x	
BCSU	MTYPE LTG LTU SLOT PARTNO FCTID LWVAR HWYBDL	PER <x> <x> <x> Q2452-x	
PTIME	REST	PAR5=2	
PTIME			..
COP	COPPAR	IPVH NAAT UWZ1 NOWA ZWZ1 MFVW MFV1 PVW1 BELQ WABR NOWA	Die Paramter BELQ,WABR oder NOWA sind entspr. dem verwendeten Prot. zu setzen IPVH: Für Impulswahl ZWZ1: Für Impulswahl MFVW: Für MFV-Wahl MFV1: Für MFV-Wahl PVW1: Für MFV-Wahl

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COP	PAR	DTMF DTM1 NSDL BR64 NAAT IDP1 TIM1 PDP1 SACK SLD NSDL	The Parameters SACK,SDL,NSDL are to set for the used Protocoll DTMF: for DTMF. DTM1: for DTMF BR64: for DP PDP1: for DTMF
COT	COTPAR	AERF STUE KTON NAAT	STUE: Für Anzeige von Unplausiblen Events NAAT: USA Trunk (wichtig für kommende Gebührenerfassung)
COT	PAR	RCL IEVT NTON NAAT	NAAT: Relevant for incoming charges
COSSU	COPYCOS NEWCOS ESBER	<w> <w> <x>	ESBER: Kundenindividuelle Parameter sind zu setzen
COSSU	COPYCOS NEWCOS AVCE	<w> <w> <x>	AVCE: Paramters to set as Customer requirements

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
TACSU	LAGE	<x>	
	COTNR	<x>	
	COPNR	<x>	
	WABE	<w>	
	VBZ	<w>	
	COS	<w>	
	LCOSS	<x>	
	LCOSD	<x>	
	BUNR	<x>	
	COFIDX	<x>	
	SATZNR	<w>	
	ZLNR	<w>	
	ALARMNR	<w>	
	CARRIER	<w>	
	ZONE	<w>	
	LIN	<w>	
	CIDDGTS	<w>	
	CBMATTR	<w>	
	SRCGRP	<w>	
	CLASSMRK	<w>	
	TCCID	<w>	
	DITIDX	<w>	
	TRTBL	<w>	
	RULEIDX	<w>	
	ATNTYP	<w>	
	INBETR	<w>	
	GERTYP	AS	
	GER	DID	
	MFCVAR	<w>	
	,ANZUNT	<w>	
	ANZZIFF	<w>	
	PRUEFNR	<w>	
	CIRCIDX	<w>	
	GEB	<w>	
	SATZINFO	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	WAHLART WAHLVAR COEX=	IWV-IWV/ MFV-MFV <w<> <w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
TACSU	PEN	<x>	
	COTNO	<x>	
	COPNO	<x>	
	DPLN	<w>	
	ITR	<w>	
	COS	<x>	
	LCOSV	<x>	
	LCOSD	<x>	
	TGRP	<x>	
	COFIDX	<w>	
	CCT	<w>	
	DESTNO	<w>	
	ALARMNO	<w>	
	CARRIER	<w>	
	ZONE	<w>	
	LIN	<w>	
	CIDDGTS	<w>	
	CBMATTR	<w>	
	SRCGRP	<w>	
	CLASSMRK	<w>	
	TCCID	<w>	
	DITIDX	<w>	
	TRTBL	<w>	
	RULEIDX	<w>	
	ATNTYP	<w>	
	INS	<w>	
	DEVTYPE	TC	
	DEV	DID	
	MFCVAR	<w>	
	SUPPRESS	<w>	
	,DGTCNT	<w>	
	TESTNO	<w>	
	CIRCIDX	<w>	
	CDRINT	<w>	
	CCTINFO	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	DIALTYPE	<x>	
	DIALVAR	<w>	
	COEX	<w>	

5.3.2.3 TMDNH -> T1BOS for Direct Inward Dialing Calls (T1DID)

5.3.2.3.1 Feature Description

The TMDNH (T1BOS -> T1DID) module is used as a digital trunk circuit for incoming direct inward dialing operation. The circuits can be operated with pulse dialing or DTMF dialing. The following protocols can be configured: Wink Start, Delay Start and Immediate Start.

5.3.2.3.2 User Interface

The type of protocol is configured by means of various COP parameters.

y = optional x= mandatory n= forbidden

Protokoll	Delay	Immediate	Wink
AMO-COP			
SACK - BELQ	n	n	x
SDL - WABR	x	n	x
NSDL-NOWA		x	
EOD - WEND	x	x	x
NAAT-NAAT	x	x	x
BR63-IPVH	y	y	y
DTMF-MFVW	y	y	y
DTM1-MFV1	y	y	y
LSUP-LUEW	n	n	n
PTIME-PTIME	P5=2	P5=2	P5=2

5.3.2.3.3 Service Information

- The module is intended for use in the USA only.
- The module uses the DS120VA,DS120VB,DS120VC device handlers.

5.3.2.3.4 Generation Example

- German

```
/* TMDNH fuer T1-BOS T1DID CO*/

/* Trunk 1 auf Lage 1-2-109-1   IWV IMMEDIATE*/
```

```
/* Trunk 1 auf Lage 1-2-109-2   MFV IMMEDIATE*/

/* Trunk 1 auf Lage 1-2-109-3   IWV WINK Start*

/* Trunk 1 auf Lage 1-2-109-3   IWV WINK Start*/

/* Trunk 1 auf Lage 1-2-109-4   MFV WINK Start*/

/* Trunk 1 auf Lage 1-2-109-5   IWV DELAY Start*/

/* Trunk 1 auf Lage 1-2-109-6   MFV DELAY Start*/

AE-LWPAR:TMD, TMDBOS, 1,
 FRAMEESF&BISUB8ON&BDETON&NETUSER, 1, 30, 4, 10, 10;
EINR-BCSU:TMD, 1, 2, 109, Q2192-X, 1, , 1, , , , , A;
EINRICHTEN-BUEND:BUNUM=242, NAME="T1EMI-IWV", ANZ=1;

EINRICHTEN-BUEND:BUNUM=243, NAME="T1EMI-MFV", ANZ=1;

EINRICHTEN-BUEND:BUNUM=244, NAME="T1EMW-IWV", ANZ=1;

EINRICHTEN-BUEND:BUNUM=245, NAME="T1EMW-MFV", ANZ=1;

EINRICHTEN-BUEND:BUNUM=246, NAME="T1EMD-IWV", ANZ=1;

EINRICHTEN-BUEND:BUNUM=247, NAME="T1EMD-MFV", ANZ=1;

/* COP 242 for  IWV IMMEDIATE*/
EINR-COP:242, IPVH&RALA&RALB&NOWA&UWZ1&NAAT, FBKW, FBKW,
 ANHKZ, TMDID;

/* COP 243 for  MFV IMMEDIATE*/
EINR-COP:243, MFVW&MFV1&RALA&RALB&NOWA&PVW1&NAAT, FBKW,
 FBKW, ANHKZ, TMDID;

/* COP 244 for  IWV WINK */
EINR-COP:244, IPVH&RALA&RALB&BELQ&WABR&UWZ1&NAAT, FBKW,
 FBKW, ANHKZ, TMDID;

/* COP 245 for  MFV WINK */
EINR-COP:245, MFVW&MFV1&RALA&RALB&BELQ&WABR&PVW1&NAAT,
 FBKW, FBKW, ANHKZ, TMDID;

/* COP 246 for  IWV DELAY */
EINR-COP:246, IPVH&RALA&RALB&WABR&UWZ1&NAAT, FBKW, FBKW,
 ANHKZ, TMDID;

/* COP 247 for  MFV DELAY */
EINR-COP:247, MFVW&MFV1&RALA&RALB&WABR&PVW1&NAAT, FBKW,
 FBKW, ANHKZ, TMDID;
EINR-COT:242, AERF&KTON&STUE&NAAT;

EINRICHTEN-TACSU:LAGE=1-2-109-1, COTNR=242, COPNR=242,
 COS=220, LCOSS=1, LCOSD=1,
BUNR=242, SATZNR="T1DID IM IWV", NBETR=J, GERTYP=AS,
 GER=T1DID, WAHLART=IWV-IWV;
```

```
EINRICHTEN-TACSU:LAGE=1-2-109-2, COTNR=242, COPNR=243,
 COS=220, LCOSS=1, LCOSD=1,
BUNR=243, SATZNR="T1DID IM MFV", INBETR=J, GERTYP=AS,
 GER=T1DID, WAHLART=MFV-MFV;

EINRICHTEN-TACSU:LAGE=1-2-109-3, COTNR=242, COPNR=244,
 COS=220, LCOSS=1, LCOSD=1,
BUNR=244, SATZNR="T1DID WI IWV", INBETR=J, GERTYP=AS,
 GER=T1DID, WAHLART=IWV-IWV;

EINRICHTEN-TACSU:LAGE=1-2-109-4, COTNR=242, COPNR=245,
 COS=220, LCOSS=1, LCOSD=1,
BUNR=245, SATZNR="T1DID WI MFV", INBETR=J, GERTYP=AS,
 GER=T1DID, WAHLART=MFV-MFV;

EINRICHTEN-TACSU:LAGE=1-2-109-5, COTNR=242, COPNR=246,
 COS=220, LCOSS=1, LCOSD=1,
BUNR=246, SATZNR="T1DID DE IWV", INBETR=J, GERTYP=AS,
 GER=T1DID, WAHLART=IWV-IWV;

EINRICHTEN-TACSU:LAGE=1-2-109-6, COTNR=242, COPNR=247,
 COS=220, LCOSS=1, LCOSD=1,
BUNR=247, SATZNR="T1DID DE MFV", INBETR=J, GERTYP=AS,
 GER=T1DID, WAHLART=MFV-MFV;

EINR-REFTA:SATZ, 1-2-109-0, 0;
```

- English

```
/* TMDNH fuer T1-BOS T1DID CO*/

/* Trunk 1 pen 1-2-109-1   IWV IMMEDIATE*/

/* Trunk 1 pen 1-2-109-2   MFV IMMEDIATE*/

/* Trunk 1 pen 1-2-109-3   IWV WINK Start*

/* Trunk 1 pen 1-2-109-3   IWV WINK Start*/

/* Trunk 1 pen1-2-109-4   MFV WINK Start*/

/* Trunk 1 pen 1-2-109-5   IWV DELAY Start*/

/* Trunk 1 pen 1-2-109-6   MFV DELAY Start*/

CHANGE-LWPAR:TYPE=TMD, TMDTYPE=TMDBOS, BLNO=1,
 OPMODE==BDETON&BISUB80N&FRAMEESF&NETUSER,
CABLETYP=1, OESDISTH=30, OESREQTH=4, SESDISTH=10,
 SESREQTH=10;

ADD-BCSU:MTYPE=TMD, LTG=1, LTU=2, SLOT=109,
 PARTNO="Q2192-X   ", FCTID=1, LWVAR="K",
LWPAR=1, HWYBDL=A;

ADD-BUEND:TGRP=242, NAME="T1EMI-IWV ", NO=1, RSV=N,
 TRACENO=0, ACDTHRH=*, PRIONO=1,
```

```
TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0;

ADD-BUEND:TGRP=243, NAME="T1EMI-MFV ", NO=1, RSV=N,
 TRACENO=0, ACDTHRH=*, PRIONO=1,
TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0;

ADD-BUEND:TGRP=244, NAME="T1EMW-IWV ", NO=1, RSV=N,
 TRACENO=0, ACDTHRH=*, PRIONO=1,
TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0;

ADD-BUEND:TGRP=245, NAME="T1EMW-MFV ", NO=1, RSV=N,
 TRACENO=0, ACDTHRH=*, PRIONO=1,
TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0;

ADD-BUEND:TGRP=246, NAME="T1EMD-IWV         ", NO=1,
 RSV=N, TRACENO=0, ACDTHRH=*,
PRIONO=1, TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0;

ADD-BUEND:TGRP=247, NAME="T1EMD-MFV         ", NO=1,
 RSV=N, TRACENO=0, ACDTHRH=*,
PRIONO=1, TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0;

ADD-COSSU:NEWCOS=220, AVCE=TA&TNOTCR&CDRC;

/* COP 242 for  IWV IMMEDIATE*/
ADD-COP:COPNO=242, PAR=RLSB&RLSA&BR64&NAAT&TIM1&NSDL,
 TRK=TA, TOLL=TA;

CHANGE-COP:COPNO=242, COPTYPE=COPADD, DEV=ANMOSIG,
 INFO="TMDID";

/* COP 243 for  MFV IMMEDIATE*/
ADD-COP:COPNO=243, PAR=DTMF&RLSB&RLSA&NAAT&PDP1&DTM1,
 TRK=TA, TOLL=TA;

CHANGE-COP:COPNO=243, COPTYPE=COPADD, DEV=ANMOSIG,
 INFO="TMDID";

/* COP 244 for  IWV WINK */
ADD-COP:COPNO=244,
 PAR=SDL&SACK&RLSB&RLSA&BR64&NAAT&TIM1, TRK=TA, TOLL=TA;

CHANGE-COP:COPNO=244, COPTYPE=COPADD, DEV=ANMOSIG,
 INFO="TMDID";

/* COP 245 for  MFV WINK */
ADD-COP:COPNO=245,
 PAR=DTMF&SDL&SACK&RLSB&RLSA&NAAT&TIM1&PDP1&DTM1,
 TRK=TA, TOLL=TA;

CHANGE-COP:COPNO=245, COPTYPE=COPADD, DEV=ANMOSIG,
 INFO="TMDID";

/* COP 246 for  IWV DELAY */
ADD-COP:COPNO=246, PAR=SDL&RLSB&RLSA&BR64&NAAT&TIM1,
 TRK=TA, TOLL=TA;
```

```
CHANGE-COP:COPNO=246, COPTYPE=COPADD, DEV=ANMOSIG,
 INFO="TMDID";

/* COP 247 for  MFV DELAY */
ADD-COP:COPNO=247,
 PAR=DTMF&SDL&RLSB&RLSA&NAAT&TIM1&PDP1&DTM1, TRK=TA,
 TOLL=TA;

CHANGE-COP:COPNO=247, COPTYPE=COPADD, DEV=ANMOSIG,
 INFO="TMDID";
ADD-COT:COTNO=242, PAR=RCL&IEVT&NTON&NAAT;

ADD-TACSU:PEN=1-2-109-1, COTNO=242, COPNO=242, DPLN=0,
 ITR=0, COS=220, LCOSV=1, LCOSD=1, TGRP=242,
COFIDX=0, CCT="T1DID IM IWV", DESTNO=0, ALARMNO=2,
 CARRIER=1, ZONE=EMPTY, LIN=0, CIDDGTS=NONE,
CBMATTR=NONE, SRCGRP=1, CLASSMRK=EC&G711, TCCID="",
 DITIDX=0, TRTBL=GDTR, RULEIDX=0, ATNTYP=CO, INS=Y,
DEVTYPE=TC, DEV=T1DID, MFCVAR=0, SUPPRESS=0, DGTCNT=0,
 TESTNO=1, CIRCIDX=3, CDRINT=1, CCTINFO=0,
DIALTYPE=DIP-DIP, DIALVAR=0-0, COEX=0;

ADD-TACSU:PEN=1-2-109-2, COTNO=242, COPNO=243, DPLN=0,
 ITR=0, COS=220, LCOSV=1, LCOSD=1, TGRP=243,
COFIDX=0, CCT="T1DID IM MFV", DESTNO=0, ALARMNO=2,
 CARRIER=1, ZONE=EMPTY, LIN=0, CIDDGTS=NONE,
CBMATTR=NONE, SRCGRP=1, CLASSMRK=EC&G711, TCCID="",
 DITIDX=0, TRTBL=GDTR, RULEIDX=0, ATNTYP=CO,
INS=Y, DEVTYPE=TC, DEV=T1DID, MFCVAR=0, SUPPRESS=0,
 DGTCNT=0, TESTNO=1, CIRCIDX=3, CDRINT=1,
CCTINFO=0, DIALTYPE=DTMF-DTMF, DIALVAR=0-0, COEX=0;

ADD-TACSU:PEN=1-2-109-3, COTNO=242, COPNO=244, DPLN=0,
 ITR=0, COS=220, LCOSV=1, LCOSD=1, TGRP=244,
COFIDX=0, CCT="T1DID WI IWV", DESTNO=0, ALARMNO=2,
 CARRIER=1, ZONE=EMPTY, LIN=0, CIDDGTS=NONE,
CBMATTR=NONE, SRCGRP=1, CLASSMRK=EC&G711, TCCID="",
 DITIDX=0, TRTBL=GDTR, RULEIDX=0, ATNTYP=CO,
INS=Y, DEVTYPE=TC, DEV=T1DID, MFCVAR=0, SUPPRESS=0,
 DGTCNT=0, TESTNO=1, CIRCIDX=3, CDRINT=1,
CCTINFO=0, DIALTYPE=DIP-DIP, DIALVAR=0-0, COEX=0;

ADD-TACSU:PEN=1-2-109-4, COTNO=242, COPNO=245, DPLN=0,
 ITR=0, COS=220, LCOSV=1, LCOSD=1, TGRP=245,
COFIDX=0, CCT="T1DID WI MFV", DESTNO=0, ALARMNO=2,
 CARRIER=1, ZONE=EMPTY, LIN=0, CIDDGTS=NONE,
CBMATTR=NONE, SRCGRP=1, CLASSMRK=EC&G711, TCCID="",
 DITIDX=0, TRTBL=GDTR, RULEIDX=0, ATNTYP=CO,
INS=Y, DEVTYPE=TC, DEV=T1DID, MFCVAR=0, SUPPRESS=0,
 DGTCNT=0, TESTNO=1, CIRCIDX=3, CDRINT=1,
CCTINFO=0, DIALTYPE=DTMF-DTMF, DIALVAR=0-0, COEX=0;

ADD-TACSU:PEN=1-2-109-5, COTNO=242, COPNO=246, DPLN=0,
 ITR=0, COS=220, LCOSV=1, LCOSD=1, TGRP=246,
```

```
COFIDX=0, CCT="T1DID DE IWV", DESTNO=0, ALARMNO=2,
 CARRIER=1, ZONE=EMPTY, LIN=0, CIDDGTS=NONE,
CBMATTR=NONE, SRCGRP=1, CLASSMRK=EC&G711, TCCID="",
 DITIDX=0, TRTBL=GDTR, RULEIDX=0, ATNTYP=CO,
INS=Y, DEVTYPE=TC, DEV=T1DID, MFCVAR=0, SUPPRESS=0,
 DGTCNT=0, TESTNO=1, CIRCIDX=3, CDRINT=1,
CCTINFO=0, DIALTYPE=DIP-DIP, DIALVAR=0-0, COEX=0;

ADD-TACSU:PEN=1-2-109-6, COTNO=242, COPNO=247, DPLN=0,
 ITR=0, COS=220, LCOSV=1, LCOSD=1, TGRP=247,
COFIDX=0, CCT="T1DID DE MFV", DESTNO=0, ALARMNO=2,
 CARRIER=1, ZONE=EMPTY, LIN=0, CIDDGTS=NONE,
CBMATTR=NONE, SRCGRP=1, CLASSMRK=EC&G711, TCCID="",
 DITIDX=0, TRTBL=GDTR, RULEIDX=0, ATNTYP=CO,
INS=Y, DEVTYPE=TC, DEV=T1DID, MFCVAR=0, SUPPRESS=0,
 DGTCNT=0, TESTNO=1, CIRCIDX=3, CDRINT=1,
CCTINFO=0, DIALTYPE=DTMF-DTMF, DIALVAR=0-0, COEX=0;

ADD-REFTA:TYPE=CIRCUIT, PEN=1-2-109-0, PRI=0, BLOCK=N,
 READYASY=N;
```

5.3.2.3.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
LWPAR	TYP	TMD	BLNR: Blocknummer frei zu vergeben später im BCSU einzutragen NETUSER: Für einen Trunk ist NETUSER zu setzen für die gegeseite nicht
	TMDTYP	TMDBOS	
	BLNR	<x>	
	OPMODE	BDETON	
	CABLETYP	BISUB8ON	
	OESDISTH	FRAMEESF	
	OESREQTH	NETUSER	
	SESDISTH	1	
	SESREQTH	30	
		4	
		10	
		10	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
LWPAR	TYPE TMDTYPE BLNO OPMODE CABLETYP OESDISTH OESREQTH SESDISTH SESREQTH	TMD TMDBOS <x> BDETON BISUB8ON FRAMEESF NETUSER 1 30 4 10 10	BLNO: Block-Number free later fill in in BCSU NETUSER: To set for one Trunk , not ot set by partenr Trunk
BCSU	TYP LTG LTU EBT SACHNR FCTID LWVAR LWPAR AKTFC STERM LTERM PTERM HWYBDL	TMD <x> <x> <x> Q2192-x 1 <x>	FCTID: Für BOS Anwendung LWPAR: Es ist die unter LWAR angegebene BLNR anzugeben

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
BCSU	MTYPE LTG LTU SLOT PARTNO FCTID LWVAR LWPAR ACTFC STERM LTERM PTERM HWYBDL	TMD <x> <x> <x> Q2192-x 1 <x>	FCTID: For BOS LWPAR: Set the Blocknumer defined under LWPAR
COP	COPPAR	IPVH NAAT UWZ1 NOWA ZWZ1 MFVW MFV1 PVW1 BELQ WABR NOWA	Die Paramter BELQ,WABR oder NOWA sind entspr. dem verwendeten Prot. zu setzen IPVH: Für Impulswahl ZWZ1: Für Impulswahl MFVW: Für MFV-Wahl MFV1: Für MFV-Wahl PVW1: Für MFV-Wahl

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COP	PAR	DTMF DTM1 NSDL BR64 NAAT IDP1 TIM1 PDP1 SACK SLD NSDL	The Parameters SACK,SDL,NSDL are to set for the used Protocoll DTMF: for DTMF. DTM1: for DTMF BR64: for DP PDP1: for DTMF
COT	COTPAR	AERF STUE KTON NAAT	STUE: Für Anzeige von Unplausiblen Events NAAT: Wichtig für kommende Gebührenerfassung bei DID (Durchwahlsätzen)
COT	PAR	RCL IEVT NTON NAAT	NAAT: Relevant for incoming DID Trunks for charge-recording
COSSU	COPYCOS NEWCOS ESBER	<w> <w> <x>	ESBER: Kundenindividuelle Parameter sind zu setzen
COSSU	COPYCOS NEWCOS AVCE	<w> <w> <x>	AVCE: Paramters to set as Customer requirements

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
TACSU	LAGE	<x>	
	COTNR	<x>	
	COPNR	<x>	
	WABE	<w>	
	VBZ	<w>	
	COS	<w>	
	LCOSS	<x>	
	LCOSD	<x>	
	BUNR	<x>	
	COFIDX	<x>	
	SATZNR	<w>	
	ZLNR	<w>	
	ALARMNR	<w>	
	CARRIER	<w>	
	ZONE	<w>	
	LIN	<w>	
	CIDDGTS	<w>	
	CBMATTR	<w>	
	SRCGRP	<w>	
	CLASSMRK	<w>	
	TCCID	<w>	
	DITIDX	<w>	
	TRTBL	<w>	
	RULEIDX	<w>	
	ATNTYP	<w>	
	INBETR	<w>	
	GERTYP	AS	
	GER	T1DID	
	MFCVAR	<w>	
	,ANZUNT	<w>	
	ANZZIFF	<w>	
	PRUEFNR	<w>	
	CIRCIDX	<w>	
	GEB	<w>	
	SATZINFO	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	WAHLART WAHLVAR COEX=	IWV-IWV/ MFV-MFV <w<> <w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
TACSU	PEN	<x>	
	COTNO	<x>	
	COPNO	<x>	
	DPLN	<w>	
	ITR	<w>	
	COS	<x>	
	LCOSV	<x>	
	LCOSD	<x>	
	TGRP	<x>	
	COFIDX	<w>	
	CCT	<w>	
	DESTNO	<w>	
	ALARMNO	<w>	
	CARRIER	<w>	
	ZONE	<w>	
	LIN	<w>	
	CIDDGTS	<w>	
	CBMATTR	<w>	
	SRCGRP	<w>	
	CLASSMRK	<w>	
	TCCID	<w>	
	DITIDX	<w>	
	TRTBL	<w>	
	RULEIDX	<w>	
	ATNTYP	<w>	
	INS	<w>	
	DEVTYPE	TC	
	DEV	T1DID	
	MFCVAR	<w>	
	SUPPRESS	<w>	
	,DGTCNT	<w>	
	TESTNO	<w>	
	CIRCIDX	<w>	
	CDRINT	<w>	
	CCTINFO	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	DIALTYPE	<x>	
	DIALVAR	<w>	
	COEX	<w>	

5.3.2.4 TMDNH-T1BOS for Incoming and Outgoing Trunk Calls

5.3.2.4.1 Feature Description

The TMDNH (T1BOS -> T1GRDSTR/T1LPSTR) module is used as a trunk circuit for incoming and outgoing traffic. The circuits can be operated with pulse dialing or DTMF dialing. The circuits can be operated as Loop Start or Ground Start.

5.3.2.4.2 Service Information

- The module is intended for use in the USA only.
- The module uses the DS101VA device handler.

5.3.2.4.3 Generation Example

- German

```
/* TMDNH fuer T1-BOS T1GRDSTR/LPSTR */

/* Trunk 1 auf Lage 1-2-109-1   GRDSTR IWV*/

/* Trunk 1 auf Lage 1-2-109-2   GRDSTR MFV*/

/* Trunk 1 auf Lage 1-2-109-3   LPSTR IWV*/

/* Trunk 1 auf Lage 1-2-109-3   LPSTR MFV*/

EINRICHTEN-WABE:542, , , AMT;

EINRICHTEN-WABE:543, , , AMT;

EINRICHTEN-WABE:544, , , AMT;

EINRICHTEN-WABE:545, , , AMT;

AE-LWPAR:TMD, TMDBOS, 1,
 FRAMEESF&BISUB8ON&BDETON&NETUSER, 1, 30, 4, 10, 10;

EINR-BCSU:TMD, 1, 2, 109, Q2192-X, 1, , 1, , , , , A;

EINRICHTEN-BUEND:BUNUM=242, NAME="T1GRD-IWV", ANZ=1;

EINRICHTEN-BUEND:BUNUM=243, NAME="T1GRD-MFV", ANZ=1;

EINRICHTEN-BUEND:BUNUM=244, NAME="T1LPS-IWV", ANZ=1;

EINRICHTEN-BUEND:BUNUM=245, NAME="T1LPS-MFV", ANZ=1;
 /* COP 242 for  IWV GRD/LPSTR*/
```

```
EINR-COP:242, IPVH&NOWA&UWZ1&NAAT&ZWZ1, FBKW, FBKW;

/* COP 243 for  MFV GRD/LPSTR*/

EINR-COP:243, MFVW&MFV1&NOWA&PVW1&NAAT, FBKW, FBKW;

EINR-COT:242, AERF&KTON&STUE&NAAT&LTVW;

EINRICHTEN-TACSU:LAGE=1-2-109-1, COTNR=242, COPNR=242,
 COS=220, LCOSS=1,
LCOSD=1, BUNR=242, SATZNR="T1GRDSTR-IWV", INBETR=J,
 GERTYP=AS, GER=T1GRDSTR,
WAHLART=IWV-IWV;

EINRICHTEN-TACSU:LAGE=1-2-109-2, COTNR=242, COPNR=243,
 COS=220, LCOSS=1,
LCOSD=1, BUNR=243, SATZNR="T1GRDSTR-MFV", INBETR=J,
 GERTYP=AS, GER=T1GRDSTR,
WAHLART=MFV-MFV;

EINRICHTEN-TACSU:LAGE=1-2-109-3, COTNR=242, COPNR=242,
 COS=220, LCOSS=1,
LCOSD=1, BUNR=244, SATZNR="TILPSTR-IWV", INBETR=J,
 GERTYP=AS, GER=T1LPSTR,
WAHLART=IWV-IWV;

EINRICHTEN-TACSU:LAGE=1-2-109-4, COTNR=242, COPNR=243,
 COS=220, LCOSS=1,
LCOSD=1, BUNR=245, SATZNR="T1LPSTR-MFV", INBETR=J,
 GERTYP=AS, GER=T1LPSTR,
WAHLART=MFV-MFV;

EINRICHTEN-RICHT:LRTGNEU, 242, SPR, "TMC16 GRD", 242,
 1-1-500, ,
NEIN, , , , , , , , NEIN, NEIN, , 1-1-0;

EINRICHTEN-LDAT:LRTG=242, LDIENST=SPR, LWERT=1,
 BUNUM=242, LWR=2, LBER=1,
CARRIER=1, ZONE=LEER, LATTR=KEINE, VCCYK=4;

EINR-LDPLN:LWM=542-X, LRTG=242, LBER=1;

EINRICHTEN-RICHT:LRTGNEU, 243, SPR, "TMC16 GRD", 243,
 1-1-500, ,
NEIN, , , , , , , , NEIN, NEIN, , 1-1-0;

EINRICHTEN-LDAT:LRTG=243, LDIENST=SPR, LWERT=1,
 BUNUM=243, LWR=2, LBER=1,
CARRIER=1, ZONE=LEER, LATTR=KEINE, VCCYK=4;

EINR-LDPLN:LWM=543-X, LRTG=243, LBER=1;

EINRICHTEN-RICHT:LRTGNEU, 244, SPR, "TMC16 LPS", 244,
 1-1-500, ,
NEIN, , , , , , , , NEIN, NEIN, , 1-1-0;
```

```
EINRICHTEN-LDAT:LRTG=244, LDIENST=SPR, LWERT=1,
 BUNUM=244, LWR=2, LBER=1,
CARRIER=1, ZONE=LEER, LATTR=KEINE, VCCYK=4;

EINR-LDPLN:LWM=544-X, LRTG=244, LBER=1;

EINRICHTEN-RICHT:LRTGNEU, 245, SPR, "TMC16 LPS", 245,
 1-1-500, ,
NEIN, , , , , , , , NEIN, NEIN, , 1-1-0;

EINRICHTEN-LDAT:LRTG=245, LDIENST=SPR, LWERT=1,
 BUNUM=245, LWR=2, LBER=1,
CARRIER=1, ZONE=LEER, LATTR=KEINE, VCCYK=4;

EINR-LDPLN:LWM=545-X, LRTG=245, LBER=1;

EINR-REFTA:SATZ, 1-2-109-0, 0;
```

- English

```
ADD-WABE:CD=542, DAR=CO, CHECK=N;

ADD-WABE:CD=543, DAR=CO, CHECK=N;

ADD-WABE:CD=544, DAR=CO, CHECK=N;

ADD-WABE:CD=545, DAR=CO, CHECK=N;

CHANGE-LWPAR:TYPE=TMD, TMDTYPE=TMDBOS, BLNO=1,
 OPMODE==BDETON&BISUB80N&FRAMEESF&NETUSER,
CABLETYP=1, OESDISTH=30, OESREQTH=4, SESDISTH=10,
 SESREQTH=10;

ADD-BCSU:MTYPE=TMD, LTG=1, LTU=2, SLOT=109,
 PARTNO="Q2192-X   ", FCTID=1,
LWVAR="K", LWPAR=1, HWYBDL=A;

ADD-BUEND:TGRP=242, NAME="T1GRD-IWV         ", NO=1,
 RSV=N, TRACENO=0, ACDTHRH=*,
PRIONO=1, TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0;

ADD-BUEND:TGRP=243, NAME="T1GRD-MFV         ", NO=1,
 RSV=N, TRACENO=0, ACDTHRH=*,
PRIONO=1, TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0;

ADD-BUEND:TGRP=244, NAME="T1LPS-IWV         ", NO=1,
 RSV=N, TRACENO=0, ACDTHRH=*,
PRIONO=1, TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0;

ADD-BUEND:TGRP=245, NAME="T1LPS-MFV         ", NO=1,
 RSV=N, TRACENO=0, ACDTHRH=*,
PRIONO=1, TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0;

ADD-COP:COPNO=242, PAR=BR64&NAAT&TIM1&NSDL&IDP1, TRK=TA,
 TOLL=TA;
```

```
ADD-COT:COTNO=242, PAR=RCL&AEOD&IEVT&NAAT&NTON;

ADD-COSSU:NEWCOS=220, AVCE=TA&TNOTCR&CDRC;

ADD-TACSU:PEN=1-2-109-1, COTNO=242, COPNO=242, DPLN=0,
 ITR=0, COS=220, LCOSV=1,
LCOSD=1, TGRP=242, COFIDX=0, CCT="T1GRDSTR-IWV",
 DESTNO=0, ALARMNO=2, CARRIER=1,
ZONE=EMPTY, LIN=0, CIDDGTS=NONE, CBMATTR=NONE, SRCGRP=1,
 CLASSMRK=EC&G711, TCCID="",
DITIDX=0, TRTBL=GDTR, RULEIDX=0, ATNTYP=CO, INS=Y,
 DEVTYPE=TC, DEV=T1GRDSTR,
MFCVAR=0, SUPPRESS=0, DGTCNT=0, TESTNO=1, CIRCIDX=3,
 CDRINT=1, CCTINFO=0,
DIALTYPE=DIP-DIP, DIALVAR=0-0, COEX=0;

ADD-TACSU:PEN=1-2-109-2, COTNO=242, COPNO=243, DPLN=0,
 ITR=0, COS=220, LCOSV=1, LCOSD=1,
TGRP=243, COFIDX=0, CCT="T1GRDSTR-MFV", DESTNO=0,
 ALARMNO=2, CARRIER=1, ZONE=EMPTY,
LIN=0, CIDDGTS=NONE, CBMATTR=NONE, SRCGRP=1,
 CLASSMRK=EC&G711, TCCID="", DITIDX=0,
TRTBL=GDTR, RULEIDX=0, ATNTYP=CO, INS=Y, DEVTYPE=TC,
 DEV=T1GRDSTR, MFCVAR=0,
SUPPRESS=0, DGTCNT=0, TESTNO=1, CIRCIDX=3, CDRINT=1,
 CCTINFO=0, DIALTYPE=DTMF-DTMF,
DIALVAR=0-0, COEX=0;

ADD-TACSU:PEN=1-2-109-3, COTNO=242, COPNO=242, DPLN=0,
 ITR=0, COS=220, LCOSV=1, LCOSD=1,
TGRP=244, COFIDX=0, CCT="TILPSTR-IWV ", DESTNO=0,
 ALARMNO=2, CARRIER=1, ZONE=EMPTY,
LIN=0, CIDDGTS=NONE, CBMATTR=NONE, SRCGRP=1,
 CLASSMRK=EC&G711, TCCID="", DITIDX=0, TRTBL=GDTR,
RULEIDX=0, ATNTYP=CO, INS=Y, DEVTYPE=TC, DEV=T1LPSTR,
 MFCVAR=0, SUPPRESS=0, DGTCNT=0, TESTNO=1,
CIRCIDX=3, CDRINT=1, CCTINFO=0, DIALTYPE=DIP-DIP,
 DIALVAR=0-0, COEX=0;

ADD-TACSU:PEN=1-2-109-4, COTNO=242, COPNO=243, DPLN=0,
 ITR=0, COS=220, LCOSV=1, LCOSD=1, TGRP=245,
COFIDX=0, CCT="T1LPSTR-MFV ", DESTNO=0, ALARMNO=2,
 CARRIER=1, ZONE=EMPTY, LIN=0, CIDDGTS=NONE,
CBMATTR=NONE, SRCGRP=1, CLASSMRK=EC&G711, TCCID=" ",
 DITIDX=0, TRTBL=GDTR, RULEIDX=0, ATNTYP=CO,
INS=Y, DEVTYPE=TC, DEV=T1LPSTR, MFCVAR=0, SUPPRESS=0,
 DGTCNT=0,    TESTNO=1, CIRCIDX=3, CDRINT=1,
CCTINFO=0, DIALTYPE=DTMF-DTMF, DIALVAR=0-0, COEX=0;

ADD-RICHT:LRTENEW, 242, VCE, "TMC16 GRD       ",  242,
 1-1-500, , NO, , , "", , , , , ,
NO, , NO, "", 1-1-0;

ADD-RICHT:LRTENEW, 243, VCE, "TMC16 GRD       ",  243,
 1-1-500, , NO,  , , "", , , , , ,
NO,  , NO, "", 1-1-0;
```

```
ADD-RICHT:LRTENEW, 244, VCE, "TMC16 LPS       ", 244,
 1-1-500, , NO,  , , "", , , , , ,
NO,  , NO, "", 1-1-0;

ADD-RICHT:LRTENEW, 245, VCE, "TMC16 LPS       ",  245,
 1-1-500, , NO,  , , "", , , , , ,
NO,  , NO, "", 1-1-0;

ADD-LODR:ODR=2, CMD=ECHO, FIELD=2;

ADD-LODR:ODR=2, CMD=END;

ADD-LODR:ODR=2, INFO="QUER A3 OFFEN";

ADD-LDAT:LROUTE=242, LSVC=VCE, LVAL=1, TGRP=242, ODR=2,
 LAUTH=1, CARRIER=1,
ZONE=EMPTY, LATTR=NONE, VCCYC=4;

ADD-LDAT:LROUTE=243, LSVC=VCE, LVAL=1, TGRP=243, ODR=2,
 LAUTH=1, CARRIER=1,
ZONE=EMPTY, LATTR=NONE, VCCYC=4;

ADD-LDAT:LROUTE=244, LSVC=VCE, LVAL=1, TGRP=244, ODR=2,
 LAUTH=1, CARRIER=1,
ZONE=EMPTY, LATTR=NONE, VCCYC=4;

ADD-LDAT:LROUTE=245, LSVC=VCE, LVAL=1, TGRP=245, ODR=2,
 LAUTH=1, CARRIER=1,
ZONE=EMPTY, LATTR=NONE, VCCYC=4;

ADD-LDPLN:LDP="542"-"X", LROUTE=242, LAUTH=1, SPC=22,
 PINDP=N;

ADD-LDPLN:LDP="543"-"X", LROUTE=243, LAUTH=1, SPC=22,
 PINDP=N;

ADD-LDPLN:LDP="544"-"X", LROUTE=244, LAUTH=1, SPC=22,
 PINDP=N;

ADD-LDPLN:LDP="545"-"X", LROUTE=245, LAUTH=1, SPC=22,
 PINDP=N;

ADD-REFTA:TYPE=CIRCUIT, PEN=1-2-109-0, PRI=0, BLOCK=N,
 READYASY=N;
```

5.3.2.4.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
LWPAR	TYP TMDTYP BLNR OPMODE CABLETYP OESDISTH OESREQTH SESDISTH SESREQTH	TMD TMDBOS <x> BDETON BISUB8ON FRAMEESF NETUSER 1 30 4 10 10	BLNR: Blocknummer frei zu vergeben später im BCSU einzutragen NETUSER: Für einen Trunk ist NETUSER zu setzen für die gegeseite nicht
LWPAR	TYPE TMDTYPE BLNO OPMODE CABLETYP OESDISTH OESREQTH SESDISTH SESREQTH	TMD TMDBOS <x> BDETON BISUB8ON FRAMEESF NETUSER 1 30 4 10 10	BLNO: Block-Number free later fill in in BCSU NETUSER: To set for one Trunk , not ot set by partenr Trunk

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
BCSU	TYP LTG LTU EBT SACHNR FCTID LWVAR LWPAR AKTFC STERM LTERM PTERM HWYBDL	TMD <x> <x> <x> Q2192-x 1 <x>	FCTID: Für BOS Anwendung LWPAR: Es ist die unter LWAR angegebene BLNR anzugeben
BCSU	MTYPE LTG LTU SLOT PARTNO FCTID LWVAR LWPAR ACTFC STERM LTERM PTERM HWYBDL	TMD <x> <x> <x> Q2192-x 1 <x>	FCTID: For BOS LWPAR: Set the Blocknumer defined under LWPAR
WABE	KZP	AMT	Kennzahlpunkt-AMT (nur für gehend relevant)
WABE	DAR	CO	Digit Anylis result=CO (only necessary for outgoing)

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COP	COPPAR	IPVH NAAT UWZ1 NOWA ZWZ1 MFVW MFV1 PVW1	Für Impulswahl: IPVH&NAAT&UWZ1&NOWA&ZWZ1 Für MFV-Wahl:.MFVW&MFV1&NAAT&NOWA&PVW1
COP	PAR	DTMF DTM1 NSDL BR64 NAAT IDP1 TIM1 PDP1	DTMF: for DTMF. DTM1: for DTMF BR64: for DP PDP1: for DTMF
COT	COTPAR	AERF LTVW STUE KGZL KTON NAAT	STUE: Für Anzeige von Unplausiblen Events
COT	PAR	RCL AEOD IEVT ICZL NTON NAAT	
COSSU	COPYCOS NEWCOS ESBER	<w> <w> <x>	ESBER: Kundenindividuelle Parameter sind zu setzen
COSSU	COPYCOS NEWCOS AVCE	<w> <w> <x>	AVCE: Paramters to set as Customer requirements

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
BUEND	BUNUM	<w>	ANZ: maximale Zahl zuzuordnender Sätze
	NAME	<w>	
	ANZ	<w>	
	RESERV	<w>	
	ANZFANG	<w>	
	ANZACD	<w>	
	PRIONUM	<w>	
	TDDRFLAG	<w>	
	GDTRRGL	<w>	
	ACDPMGRP	<w>	
BUEND	TGRP	<w>	only for outgoing Trunks necessary
	NAME	<w>	
	NO	<w>	
	RSV	<w>	
	TRACENO	<w>	
	ACDTHRH	<w>	
	PRIONO	<w>	
	TDDRFLAG	<w>	
	GDTRULE	<w>	
	ACDPMGRD	<w>	
PTIME			Standart Werte werden verewendet
PTIME			Standart values will be used

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
TACSU	LAGE	<x>	
	COTNR	<x>	
	COPNR	<x>	
	WABE	<w>	
	VBZ	<w>	
	COS	<w>	
	LCOSS	<x>	
	LCOSD	<x>	
	BUNR	<x>	
	COFIDX	<x>	
	SATZNR	<w>	
	ZLNR	<w>	
	ALARMNR	<w>	
	CARRIER	<w>	
	ZONE	<w>	
	LIN	<w>	
	CIDDGTS	<w>	
	CBMATTR	<w>	
	SRCGRP	<w>	
	CLASSMRK	<w>	
	TCCID	<w>	
	DITIDX	<w>	
	TRTBL	<w>	
	RULEIDX	<w>	
	ATNTYP	<w>	
	INBETR	<w>	
	GERTYP	AS	
	GER	T1LPSRT or T1GDSTR	
	MFCVAR	<w>	
	,ANZUNT	<w>	
	ANZZIFF	<w>	
	PRUEFNR	<w>	
	CIRCIDX	<w>	
	GEB	<w>	
	SATZINFO	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	WAHLART WAHLVAR COEX=	<w> IWV-IWV/ MFV-MFV <w><> <w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
TACSU	PEN	<x>	
	COTNO	<x>	
	COPNO	<x>	
	DPLN	<w>	
	ITR	<w>	
	COS	<x>	
	LCOSV	<x>	
	LCOSD	<x>	
	TGRP	<x>	
	COFIDX	<w>	
	CCT	<w>	
	DESTNO	<w>	
	ALARMNO	<w>	
	CARRIER	<w>	
	ZONE	<w>	
	LIN	<w>	
	CIDDGTS	<w>	
	CBMATTR	<w>	
	SRCGRP	<w>	
	CLASSMRK	<w>	
	TCCID	<w>	
	DITIDX	<w>	
	TRTBL	<w>	
	RULEIDX	<w>	
	ATNTYP	<w>	
	INS	<w>	
	DEVTYPE	TC	
	DEV	T1LPSTR	
	MFCVAR	or T1GRDSTR	
	SUPPRESS	<w>	
	,DGTCNT	<w>	
	TESTNO	<w>	
	CIRCIDX	<w>	
	CDRINT	<w>	
	CCTINFO	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	DIALTYPE	<w>	
	DIALVAR	<w>	
	COEX	<x>	
		<w>	
RICHT	ART	LRTGNEU	nur für gehende Belegung relevant
	LRTG	<x>	MFVUMS: für MFV-Nachwahl zu setzen
	LDIENST	<w>	
	NAME	<w>	
	BUNUM	<x>	
	ZKNNR	<w>	
	ROUTOPT	<w>	
	REROUT	<w>	
	MFVUMS	<w>	
	MFVANZ	<w>	
	MFVTEXT	<w>	
	MFVPULS	<w>	
	VLVER	<w>	
	UMLVER	<w>	
	ZLNR	<w>	
	PIN	<w>	
	ROUTATT	<w>	
	EMCYRTT	<w>	
	INFO	<w>	
	PZKNNR	<w>	

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
RICHT	MODE	LRTENEW	only for outgoing Trunks necessary
	LRTE	<x>	DTMFCNV: is to set for DTMF Postdialing
	LSVC	<w>	
	NAME	<w>	
	TGRP	<x>	
	DNNO	<w>	
	ROUTOPT	<w>	
	REROUT	<w>	
	DTMFCNV	<w>	
	DTMFDISP	<w>	
	DTMFTEXT	<w>	
	DTMFPULS	<w>	
	PLB	<w>	
	FWDBL	<w>	
	DESTNO	<w>	
	PIN	<w>	
	ROUTATT	<w>	
	EMCYRTT	<w>	
	INFO	<w>	
	PDNNO;	<w>	
LODR			nur für gehende belegung relevant, siehe LCR Administration
LODR			only fpr outgoing Trunks necessary, see LCR administration
LDAT			nur für gehende belegung relevant, siehe LCR Administration
LDAT			only fpr outgoing Trunks necessary, see LCR administration
LDPLN			nur für gehende belegung relevant, siehe LCR Administration
LDPLN			only fpr outgoing Trunks necessary, see LCR administration

5.3.3 Recorded Announcement Feature

5.3.3.1 Feature Description

In the event of an incoming call, a recorded announcement can be played to the calling subscriber. This announcement can originate from a recorded announcement device or take the form of a preconfigured OpenScape 4000 recorded announcement.

5.3.3.2 Service Information

5.3.3.2.1 With Privileged Station AMO SSC

- The COP parameter ANNC (local recorded announcement) is to be set in the incoming circuit. A configured local recorded announcement is then created for the incoming seizure. The COP parameters DTN (incoming seizure dial tone) and ANNC are mutually exclusive.
- If the system is to use a predefined recorded announcement or music, the local recorded announcements must be assigned the desired value in AMO ZAND:TYPE=TONES.
- If an external recorded announcement device is to be used, a privileged station must be configured with the AMO SSC with the TYPE=EXTANN and the CPCALL=LOCANN. The external recorded announcement device is connected to this privileged station.

5.3.3.2.2 Synchronous / Asynchronous Recorded Announcement with TMOM Module

- See Chapter 168, "Synchronized Announcements"/Asynchronous Recorded Announcement
- The TMOM module and a recorded announcement device are required.

5.3.4 DIT Feature

5.3.4.1 Feature Description

If an analog trunk (CO or tie) is seized in the incoming direction, the call is forwarded to the number configured in the Hotline Table.

5.3.4.2 User Interface

In the event of seizure of an incoming circuit, a CO or tie trunk subscriber is automatically forwarded to the preconfigured subscriber number, regardless of the number he has dialed.

5.3.4.3 Service Information

- The DITW feature (COP parameter DITW) with digit prefixing (DGTPR in AMO TACSU) has the same effect in the case of a tie trunk; both features may not be used together.

- The feature is only effective in the case of incoming seizure type ATND or HAUS1.
- The COT parameter DIT must be set in the associated trunk.
- The COP parameters DITW, DTN, DTV may not be set when using the DIT feature.
- The COP parameters DTN (incoming seizure dial tone) and DTV (dial tone analysis) have no effect if the DIT feature is activated. Therefore, synchronous/asynchronous recorded announcement is also not possible.
- The HOTRCL feature in AMO FEASU must be set, and a valid DITIDX configured in AMO TACSU and a subscriber number configured in AMO HOTLN.
- In AMO TACSU, the DITIDX must be in the range of 1 to 512; a DITIDX value of 0 acts as if no DIT feature had been configured.
- If no HOTLN number has been entered or if FEASU HOTRCL has not been set or the DITIDX in AMO TACSU has not been entered, the DIT feature is not executed. In this case, the call behaves as if no DIT feature has been configured (i.e. switching system call).

5.3.4.4 Generation Example

5.3.4.4.1 German

- `EINR-HOTLN:TYP=HOTZIEL, HTLNIDX=<Nummer>, RZIEL=<key-Nummer>;`

5.3.4.4.2 English

- `ADD-HOTLN:TYPE=HOTDEST, HTLNIDX=<number>DEST=<key-Nummer>;`

5.3.4.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
FEASU	SET	HOTROE	HOTROE muss freigegeben werden
FEASU	SET	HOTRLC	HOTRLC must set to free
COT	COTPAR	DIT	Parameter DIT muss gesetzt werden.
COT	COTPAR	DIT	Parameter must be set
HOTLN	TYP HTLNIDX RZIEL	HOTZIEL <x> <yyy>	HTLNIDX ein Wert zwischen 0 und 512 RZIEL eine gültige Teilnehmernummer
HOTLN	TYPE HTLNIDX DEST	HOTDEST <x> <yyyy>	HTLNIDX a value between 0 and 512 DEST a valid Subscriber Number

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
TACSU	DITIDX	<x>	Es ist der entsprechende Wert welcher unter HTLNIDX eingetragen wurde einzusetzen
TACSU	DITIDX	<x>	Take the value what is set in HTLNIDX and set it in TACSU

5.3.5 Supplemantary dialing

The feature "Supplementary dialing" is forbidden to use by US-Trunks.

5.3.6 Real Dialtone from Central-Office

If the outgoing seized Trunk should hear "Real Dialtone" from the connected CO and should connected to the Subscriber or the transit-trunk, the following parameters are to set:

This function is only possible if the outgoing trunk has set the parameters "waiting for dialtone" or "line with no start dial signal".

The COP-Parameter "TDED" must administrated to the existing COP-Parameters.

The CO must send "Dial-Tone"

In AMO-TACSU the Parameter DIALVAR=X-8 is to set, "X" is normally to set to "0"

The AMO-LODR is to administrate only with END (no ECHOFELD) so that the dial-tone can be heard allready when dialing the access-code.

Also the AMO-LDPLN is only to administrate with the access-code.

Remark: The dial-tone from the CO must be released from the CO after getting the first dialed digit.

5.3.7 RealTrunk Group Overflow (Rerouting) for Trunks in the Event of a Fault

For outgoing seizable circuits or ports (TMC16/T1Loop Ground) which are triggered on account of a fault (e.g. no incoming circuit seizable or no audible signal) and enter disabled state, another circuit can be searched in the same trunk group and seized, or if there is no trunk available in the same trunk group,searched in a different trunk group and seized via trunk group overflow (Rerouting) without having to dial again.

To this end, it is necessary to configure another trunk group with circuits, in addition to the trunk group originally used.

The original and additional trunk group numbers must be specified in AMO RICHT. Furthermore, the parameter REROUTING must be set to YES, also the parameter RERINGRP (Rerouting in the same trunk-group) must be set to YES

The AMO LDAT with its original LCR number must be reconfigured with the additional trunk group number.

Example:

5.3.7.1 Original Trunk Group

- German

```
EINRICHTEN-BUEND:BUNUM=223, NAME="TMC16 ", ANZ=4,
 RESERV=N, ANZFANG=0, ANZACD=*,
PRIONUM=1, TDDRFLAG=ON, GDTRRGL=0, ACDPMGRP=0;

EINRICHTEN-TACSU:LAGE=1-1-97-0, COTNR=223, COPNR=223,
 WABE=0, VBZ=0, COS=220,
LCOSS=1, LCOSD=1, BUNR=223, COFIDX=0, SATZNR="TMC16
  ", ZLNR=0, ALARMNR=2,
CARRIER=1, ZONE=LEER, LIN=0, CIDDGTS=KEINE,
 CBMATTR=KEINE, SRCGRP=1,
CLASSMRK=EC&G711, TCCID=" ", DITIDX=0, TRTBL=GDTR,
 RULEIDX=0, ATNTYP=COLOW, INBETR=J,
GERTYP=AS, GER=LPSTR, MFCVAR=0, ANZUNT=0, ANZZIFF=0,
 PRUEFNR=1, CIRCIDX=2, GEB=1,
SATZINFO=0, WAHLART=IWV-IWV, WAHLVAR=0-0, COEX=0;

EINRICHTEN-RICHT:ART=LRTGNEU, LRTG=223, LDIENST=SPR,
 NAME="TMC16  ", BUNUM=223,
ZKNNR=1-1-500, REROUT=JA, ROUTATT=NEIN, RERINGRP=JA,
 EMCYRTT=NEIN, PZKNNR=1-1-0,
===RERINGROUP=JA====;

EINRICHTEN-LODR:LWR=2, LWREL=ECHOFELD, FELD=2;

EINRICHTEN-LDAT:LRTG=223, LDIENST=SPR, LWERT=1,
 BUNUM=223, LWR=2, LBER=1, CARRIER=1,
ZONE=LEER, LATTR=KEINE, VCCYK=4;

EINRICHTEN-LDPLN:LWM="523"-"X", LRTG=223, LBER=1,
 IPS=22, PINDP=NEIN;
```

- English

```
ADD-BUEND:TGRP=223, NAME="TMC16-1LOOP", NO=2, RSV=N,
 TRACENO=0, ACDTHRH=*,
PRIONO=1, TDDRFLAG=ON, GDTRRULE=0, ACDPMGRP=0,
 CHARCON=NEUTRAL;

ADD-TACSU:PEN=1-1-97-0, COTNO=223, COPNO=223, DPLN=0,
 ITR=0, COS=220, LCOSV=1,
LCOSD=1, TGRP=223, COFIDX=0, CCT="TMC16 LOOP  ",
 DESTNO=0, ALARMNO=2, CARRIER=1,
ZONE=EMPTY, LIN=0, CIDDGTS=NONE, CBMATTR=NONE, SRCGRP=1,
 CLASSMRK=EC&G711, TCCID=" ",
DITIDX=0, TRTBL=GDTR, RULEIDX=0, ATNTYP=COLOW, INS=Y,
 DEVTYPE=TC, DEV=LPSTR, MFCVAR=0,
```

```
SUPPRESS=0, DGTCNT=0, TESTNO=1, CIRCIDX=3, CDRINT=1,
 CCTINFO=0, DIALTYPE=DIP-DIP,
DIALVAR=0-0, COEX=0;

ADD-RICHT:MODE=LRTENEW, LRTE=223, LSVC=VCE, NAME="TMC16
 LOOP     ", TGRP=223&224,
RERINGRP=YES, REROUT=YES, DNNO=1-1-400, ROUTATT=YES,
 EMCYRTT=NO, PDNNO=1-1-0,
CHARCON=NEUTRAL, CONFTONE=NO;

ADD-LDAT:LROUTE=223, LSVC=VCE, LVAL=1, TGRP=223, ODR=2,
 LAUTH=1, CARRIER=1,
ZONE=EMPTY, LATTR=NONE, VCCYC=4;

ADD-LDAT:LROUTE=223, LSVC=VCE, LVAL=1, TGRP=224, ODR=2,
 LAUTH=1, CARRIER=1,
ZONE=EMPTY, LATTR=NONE, VCCYC=4;

ADD-LODR:ODR=2, CMD=ECHO, FIELD=2;

ADD-LODR:ODR=2, CMD=END;

ADD-LODR:ODR=2, INFO="QUER A3 OFFEN";

ADD-LDPLN:LDP="523"-"X", LROUTE=223, LAUTH=1, SPC=22,
 PINDP=N;

Overflow Trunk Group
```

5.3.7.2 Trunk Group Overflow

- German

```
/* Ein weiters Bündel einrichten */
EINRICHTEN-BUEND:BUNUM=224, NAME="TMC16-UEBERLAUF
 ", ANZ=4, RESERV=N, ANZFANG=0, ANZACD=*, PRIONUM=1,
 TDDRFLAG=ON, GDTRRGL=0, ACDPMGRP=0;
 /* Weietere Sätze oder Satz einrichten */

EINRICHTEN-TACSU:LAGE=1-1-97-
1, COTNR=223, COPNR=223, WABE=0, VBZ=0, COS=220,
 LCOSS=1, LCOSD=1, BU
NR=224, COFIDX=0, SATZNR="TMC16-UEBERLAUF
", ZLNR=0, ALARMNR=2, CARRIER=1, ZONE=LEER, LIN=0,
 CIDDGTS=KEINE, CB
MATTR=KEINE, SRCGRP=1, CLASSMRK=EC&G711, TCCID="
", DITIDX=0, TRTBL=GDTR, RULEIDX=0, ATNTYP=COLOW,
 INBETR=J, GERTYP=
AS, GER=LPSTR, MFCVAR=0, ANZUNT=0, ANZZIFF=0, PRUEFNR=1,
 CIRCIDX=2,
GEB=1, SATZINFO=0, WAHLART=IWV-IWV, WAHLVAR=0-0, COEX=0;
 /* Die bestehnde Richtung umdas weitere Bündel
 erweitern
sowie REROUTING auf JA setzen /*
```

```
EINRICHTEN-RICHT:ART=LRTGNEU, LRTG=223, LDIENST=SPR,
 NAME="TMC16
", BUNUM=223&224, ZKNNR=1-1-
500, REROUT=JA, ROUTATT=NEIN, EMCYRTT=NEIN,
 PZKNNR=1-1-0;
 /* LDAT für die bestehden LRTG-Richtung nochmals mit
 dem
neuem Bündel einrichten */

EINRICHTEN-
LDAT:LRTG=223, LDIENST=SPR, LWERT=1, BUNUM=224, LWR=2,
 LBER=1, CARR
IER=1, ZONE=LEER, LATTR=KEINE, VCCYK=4;
```

- English

```
/* Spezial Trunk-Group for Rerouting /

ADD-BUEND:TGRP=224, NAME="TMC16 -Rerouting ", NO=4,
 RSV=N, TRACENO=0,
ACDTHRH=*, PRIONO=1, TDDRFLAG=ON, GDTRRULE=0,
 ACDPMGRP=0;

/* Genrating one or more Trunks for Rerouting */

ADD-TACSU:PEN=1-1-97-1, COTNO=224, COPNO=223, DPLN=0,
 ITR=0, COS=220,
LCOSV=1, LCOSD=1, TGRP=223, COFIDX=0, CCT="TMC16 LOOP
 ", DESTNO=0,
ALARMNO=2, CARRIER=1, ZONE=EMPTY, LIN=0, CIDDGTS=NONE,
 CBMATTR=NONE,
SRCGRP=1, CLASSMRK=EC&G711, TCCID="", DITIDX=0,
 TRTBL=GDTR, RULEIDX=0,
ATNTYP=COLOW, INS=Y, DEVTYPE=TC, DEV=LPSTR, MFCVAR=0,
 SUPPRESS=0,
DGTCNT=0, TESTNO=1, CIRCIDX=3, CDRINT=1, CCTINFO=0,
 DIALTYPE=DIP-DIP,
DIALVAR=0-0, COEX=0;

/* Change AMO-RICHT for 2 Trunk-Groups and REROUTING=YES
 */

ADD-RICHT:LRTENEW, 223, VCE, "TMC16 LOOP      ",
 223&224,
1-1-500, , NO,  , , "", , , , , , YES, , NO, "", 1-1-0;

/* Add LDAT for the existing LROTE with the Trunk-Group
 for
Rerouting */

ADD-LDAT:LROUTE=223, LSVC=VCE, LVAL=1, TGRP=224, ODR=2,
 LAUTH=1,
CARRIER=1, ZONE=EMPTY, LATTR=NONE, VCCYC=4;
```

5.4 ANIF Automatic Number Identification

5.4.1 Feature Description

ANIF (automatic number identification forward) is a OpenScape 4000 feature for the Confederation of Independent States (CIS), which provides the exchange with calling line number information.

With the ANIF feature, the OpenScape 4000 system supports the following public network services:

- Toll exchange connections (long-distance)
- Special services
- Chargeable services
- Malicious call tracing

5.4.2 User Interface

No explicit interface for OpenScape 4000 users.

5.4.3 Service Information

Used primarily for CIS.

5.4.4 Generation

- Add board data (DIUC64):

```
ADD-BCSU:MTYPE=DIU, LTG=number, LTU=number,
 SLOT=number,
PARTNO="Q2185-X   ";
```

- Add board data (SIUX):

```
ADD-BCSU:MTYPE=SIUP, LTG=number, LTU=number,
 SLOT=number,
PARTNO="Q2233-X   ", MFCTYPE=ANIF, LWVAR=0, FCTID=5;
```

- Add digit analysis result for device type "BWCISL"

```
ADD-WABE:CD=429, DAR=TIE, CHECK=N;
```

- Add timers for device type "BWCISL"

```
COPY-PTIME:INIBLOCK=54, TBLK=3;

CHANGE-PTIME:TYPE=REST, TBLK=3, BTYPE=PARA, P11=1;
```

- Add classes of service for device type "BWCISL"

```
ADD-
COSSU:NEWCOS=1,
 AVCE=TTCR2&TTCR4&CDRATN&CDRC&COSXCD&FWDNWK&MTRACE&
 ATRACE;
```

```
CHANGE-COSSU:TYPE=COS, COS=1,
 AFAX=TTCR2&FAX&BASIC&INTWOR&OFTFS;

CHANGE-COSSU:TYPE=COS, COS=1, ADTE=TTCR2&BASIC&DSM;

ADD-COSSU:NEWCOS=200, AVCE=TA&TSUID&TNOTCR&CDRC;

ADD-COSSU:NEWCOS=106, AVCE=ANITC;

CHANGE-COSSU:TYPE=COEX, COEX=6, COS=106;
```

- Add class of parameter for device type "BWCISL"

```
ADD-COP:COPNO=201,
PAR=SDL&ANS&LSUP&RLSA&BR64&NOAN&TIM1&IDP1&ANIW&TL7&
 RF0C&AST1;
```

- Add class of trunk for device type "BWCISL"

```
ADD-COT:COTNO=201, PAR=RCL&ANS&TRAI&NTON;
```

- Assign trunk group for device type "BWCISL"

```
ADD-BUEND:TGRP=129, NAME="ani-cis ', NO=4;
```

- Edit MFC table:

```
COPY-MFCTA:MFCVARI=19, MFCVAR=1;

CHANGE-MFCTA:MFCVAR=1, TYPE=TBLB, OPT=FSIG, PHYSIG=15,
 SIG=EOD;
 C
HANGE-MFCTA:MFCVAR=1, TYPE=MFCVAR, OPT=SUPERV,
 MAXDGTS=8;
```

- Add analog trunk configuration data:

```
ADD-TACSU:PEN=GG-UU-BBB-SS, COTNO=201, COPNO=201,
 COS=200, LCOSV=1,
LCOSD=1, TGRP=129, CCT="ani-cis outg", NNO=9, INS=YES,
 DEVTYPE=TC,
DEV=BWCISL, MFCVAR=1, DGTCNT=1, CIRCIDX=3, CDRINT=1,
 DIALTYPE=DIP-DIP,
DIALVAR=0-0;
```

- Assign outgoing route data

```
ADD-RICHT:MODE=LRTENEW, LRTE=229, LSVC=ALL, NAME="mfs-
cis  ",
TGRP=129, DNNO=1;

ADD-LODR:ODR=49, CMD=OUTCOEX, COEX=6;

ADD-LODR:ODR=49, CMD=ECHO, FIELD=2;

ADD-LODR:ODR=49, CMD=END;

ADD-LDAT:LROUTE=229, LSVC=ALL, TGRP=129, ODR=49,
 LAUTH=1, LATTR=WCHREG;

ADD-LDPLN:LDP=429-z, LROUTE=229, LAUTH=1;
```

5.5 Automatic Node Topology Detection

5.5.1 Feature Description

This feature is used to automatically detect the topology of a OpenScape 4000 network and communicate the topology data to the higher-level tools such as Remote Service Platform-Smart.

To this end, provided the feature has been activated, a so-called "partner table" which can be queried with the AMO KNTOP is established automatically in every OpenScape 4000 node. This table contains information per B-channel group concerning the partner nodes (adjacent node = nearest transit node) connected via this B-channel group in the circuit.

By querying all nodes, i.e. calling up the AMO KNTOP in all nodes, the tool determines the topology of the entire network.

This feature always uses the physical node numbers / node access codes (defined in the AMO ZAND), not the virtual ones,for example, configured in the AMO KNDEF.

Automatic detection only functions in a homogenous OpenScape 4000/HiPath 4000 network. CorNet-NQ with Segmentation 8 must be configured as the networking protocol. Components which convey the CorNet-NQ protocol transparently are not detected (e.g. ATM networks, multiplexers, ViNet). However, the OpenScape 4000 nodes networked via such installations do appear in the topology. Remote IP access points are not detected. Only the OpenScape 4000 host system is detected, as only the host system is assigned a physical node number.

In heterogeneous networks (e.g. with Hicom 300 nodes), you can use the AMO KNTOP to perform manual entries in the partner table which can no longer be overwritten by automatic entries. You also have the option of marking manual entries as over-writeable. These can then be replaced by automatic entries. The purpose of this is to configure Hicom 300 nodes which you know will be upgraded to OpenScape 4000 in future with this marker, thus avoiding the need to subsequently perform changes with the AMO KNTOP.

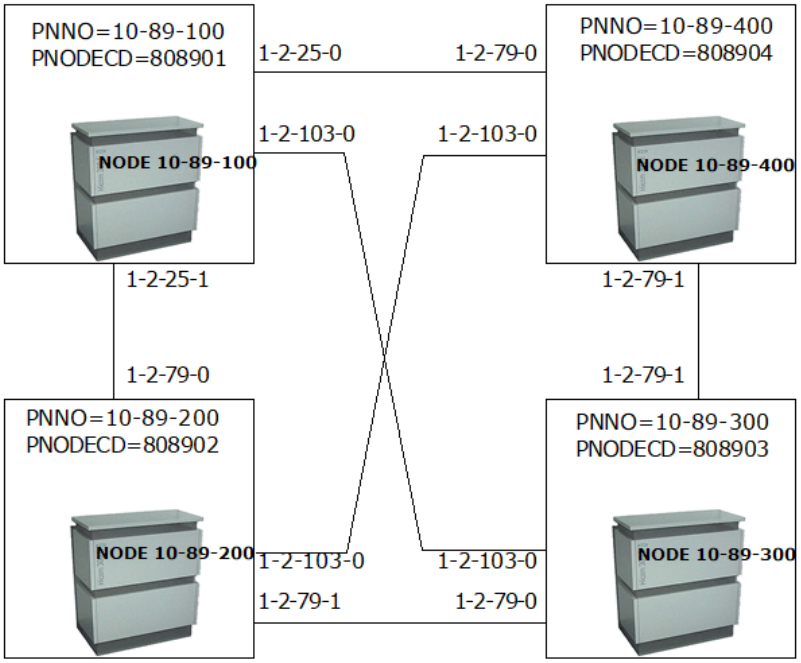


Figure 11: Example: Homogenous OpenScape 4000/HiPath 4000 network

In Figure 11, Example: Homogenous OpenScape 4000/HiPath 4000 network, the physical nodes are specified with the AMO ZAND designations PNNO and PNODECD. The tie lines are designated by specifying the port equipment number (PEN) in the corresponding partner nodes. The tie trunk circuits can be S0 or S2 circuits (also ATM circuits); CorNet-NQ with Segmentation 8 must be assigned to all circuits as the networking protocol.

In nodes 10-89-100, the following information is stored in the partner table:

- The line at the tie trunk circuit with PEN 1-2-25-0 leads to the physical node with the node number 10-89-400 and the node access code 808904 (partner node). In the partner node, this line is connected to PEN 1-2-79-0.
- The line at circuit 1-2-25-1 leads to partner node 10-89-4200 (node access code 808902). There, this line is connected to circuit 1-2-79-0.
- The line at circuit 1-2-103-0 leads to partner node 10-89-300 (node access code 808903). There, this line is connected to circuit 1-2-103-0.

In node 10-89-400, the following information is stored in the partner table:

- The line at circuit 1-2-79-0 leads to partner node 10-89-100 (node access code 808901). There, this line is connected to circuit 1-2-25-0.
- The line at circuit 1-2-79-1 leads to partner node 10-89-300 (node access code 808903). There, this line is connected to circuit 1-2-79-1.
- The line at circuit 1-2-103-0 leads to partner node 10-89-200 (node access code 808902). There, this line is connected to circuit 1-2-103-0.

The same principle applies to the entries in the partner tables of the remaining nodes.

The user tool (e.g. Remote Service Platform) can detect and graphically display the connecting lines by assigning the nodes / PEN pairs of all partner tables.

For example, the partner tables of 10-89-100 and 10-89-400 contain the matching pairs:

- 10-89-100: Circuit 1-2-025-1 leads to node 10-89-200, where the circuit is 1-2-079-0
- 10-89-100: Circuit 1-2-025-0 leads to node 10-89-400, where the circuit is 1-2-079-0
- 10-89-100: Circuit 1-2-103-0 leads to node 10-89-300, where the circuit is 1-2-103-0

This means that a connecting line exists between these points.

5.5.2 User Interface

Every node can be queried individually by service personnel via AMO. After the OpenScape 4000/HiPath 4000 network nodes have been booted and assuming the feature is activated (which it is as standard), establishment of the partner tables can be commenced automatically in each node following a stabilization period (approx. 5 min.). As the cross-node exchange of information is handled via the CorNet-NQ messages SETUP or CONNECT, the network must be carrying switching loads. The time taken until the complete topology is established depends on the load situation and the configuration of the ZAND Polling Timer.

The feature is designed in such a way that only long-term changes (of an order of magnitude of 10 min.) are detected and network performance is not impaired.

In this context, it must be noted that, although the automatic mechanism is started immediately in the case of newly configured lines / B-channel groups or activated lines, an entry is only initiated upon the presence of a switching load.

In the event of faults (interrupted/deactivated lines, defective or deactivated nodes), the entries are not deleted until after an intentional delay. A node is only deleted from the partner table automatically if it does not respond despite multiple repetitions, with the repetition interval likewise depending on the ZAND Polling Timer. A switching load has no effect on the deletion.

5.5.3 Service Information

IMPORTANT: When using "Automatic Node Topology Detection" feature to switches with mixed routes to a partner system i.e. IP trunking and TDM, then the Automatic Topology will not work unless there is a corresponding overlay network with Gateway Information in AMO LDAT (GW parameter) to the partner nodes. Required is therefore to use the configuration of an overlay network via IP trunking to the corresponding nodes with correct GW LDAT partner entries. If the configuration is incorrect then no TSC Setup will be sent for the feature.

5.5.3.1 Feature Activation / Deactivation

The feature is activated as standard.

With the AMO command:
`DIS-ZAND:TYPE=ALLDATA3;`

you can determine if the feature is activated. If the value of the parameter NWTOPTIM is anything other than 0, the feature is active. The value designates the polling intervals, i.e. the intervals at which the poll is switched from one CorNet-NQ line to the next, or from one B-channel group to the next. The sequence is determined by the mapping of the physical / fictional lines in the system (i.e. the "Lines").

With the AMO command:
`CHA-ZAND:TYPE=ALLDATA3,NWTOPTIM=0;`

the polling is stopped, but not the feature in general. In other words, lines previously marked for the feature may still lead to new entries in the partner table. Existing entries are likewise retained. These can be deleted with the AMO KNTOP, if necessary.

If the feature has never been activated because NWTOPTIM was set to 0 in the AMO generation batch before the circuits were configured with the AMO TDCSU, the feature is generally deactivated and no entry is made in the partner table. If the feature is to be activated, the following AMO command must be entered:

```
CHA-ZAND:TYPE=ALLDATA3,NWTOPTIM=xx;
(xx >0, corresponds to polling time in seconds)
```

5.5.3.2 Feature Parameterization

If the feature is activated (see Section 25.3.1, "Feature Activation / Deactivation"), you can make certain adjustments. However, the basic settings suffice in virtually all cases.

- Configuring the polling interval (handling of the Polling Timer is described in Section 25.3.1, "Feature Activation / Deactivation"):
  `CHA-ZAND:TYPE=ALLDATA3, NWTOPTIM=<time in seconds>;`

  The default setting is 20 seconds. If the polling interval is shortened, the poll is performed faster, which results in the partner table being adjusted faster in the event of changes in the topology. However, this increases the network load. The opposite happens if a longer polling interval is selected.
- Configuring the Multiplexer Timer of a circuit / B-channel group:

  ```
  CHA-TDCSU:PEN=ltg-ltu-slot-circuit,NWMUXTIM=<time in
   seconds>;
  ```

  The default setting is 10 seconds. This allows you to specify the time windows in which further partner node messages are to be awaited once a partner node has reported to a line / B-channel group. This is only of significance if several partner nodes are connected to a line / B-channel group via a multiplexer or another CorNet-NQ transport system (e.g. ViNet).

  If, in this instance, an excessively small time windows is selected, partner nodes might not be detected until after many polling cycles, with this in turn being dependent on the switching situation (if the partner node is frequently busy with calls, be it in transit or as a terminating node of a connection, there

is a high probability that the call will fall within a time window and thus be detected).

If an excessively large time windows is selected, the processor load is increased, as every call within the time windows is processed by the program. The load in the D-channel of the networking protocol is likewise increased.

IMPORTANT: The standard setting of the NWMUXTIM in the AMO TDCSU should only be altered in exceptional cases.

- The number of repetitions of unanswered messages to the partner node before the node is deleted from the partner table is fixed at a value of 5 and cannot be administrated via AMO.

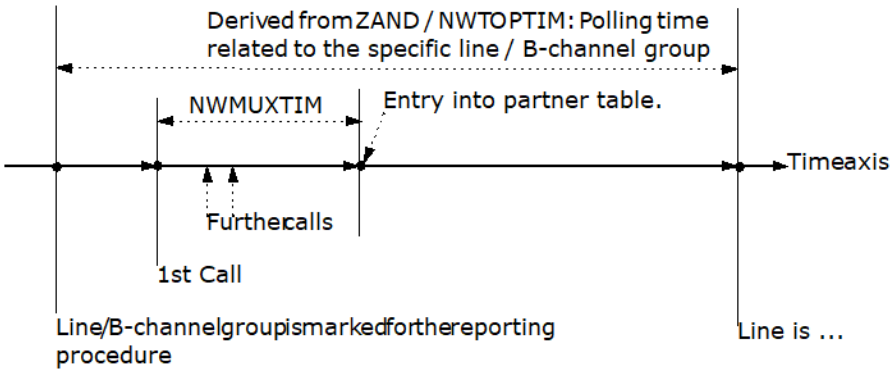


Figure 12: Timing parameterization

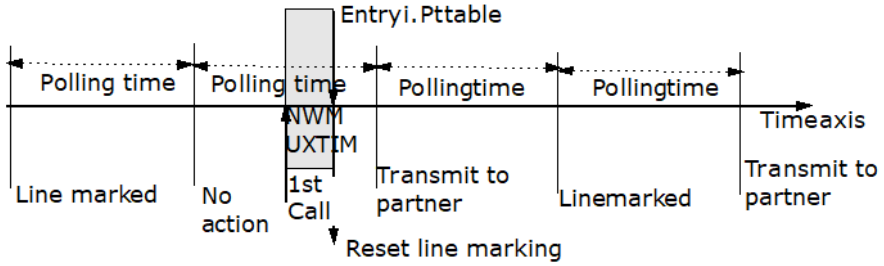


Figure 13: View across several polling cycles

Figure 12, Timing parameterization shows the effect of the two timers NWTOPTIM and NWMUXTIM within a polling period. The NWMUXTIM does not start until after the line or B-channel group has been marked (this takes place automatically on every 2nd poll) and a call has been established via the marked line. In this procedure, an entry is made in the partner table (either a new entry is made, or an old one overwritten).

It must be noted that the polling time does not correspond to the ZAND value NWTOPTIM, but is instead derived from it: NWTOPTIM is the polling time between 2 successive lines / B-channel groups. The respective line is not due again until all lines in the system have been processed (this means that the time, in relation to the line, is yielded by a multiplication of NWTOPTIM with the number of CorNet-NQ lines / B-channel groups in the system).

Figure 13, View across several polling cycles illustrates the behavior across several polling cycles in relation to the line. Let us assume there is, as yet, no entry in the partner table for this line. You see that a transmission is started to the partner (provided this is already known in the partner table) with every 2nd polling cycle. Only via this mechanism are nodes deleted from the partner table automatically in the event of repeated failure (partner does not answer). In the case of multiplexers / ViNet, i.e. whenever several partner nodes are "connected" to one line, the further Calls for the nodes connected via the line must fall within the NWMUXTIM time windows (highlighted field in the diagram), in order for them to be adopted in the partner table.

5.5.3.3 What Information Does the Feature Provide?

By means of the AMO KNTOP, manual entries can be created in the partner table. Manual and automatic entries are displayed and can also be deleted. Output can be realized both in short and long output formats. In short output format, only the most important information of the partner is displayed, while long output format also displays additional information concerning the own node. Furthermore, a third format is available for diagnostic purposes. This is the query format START (see Section 25.3.4, "Diagnostic options"). The following section briefly explains the KNTOP outputs of the long output format:

- **NNO**: This is the physical node number, as configured individually in the PNNO parameter of the AMO ZAND in every node. In the KNTOP output mask, the NNO of the own node is displayed in the left column beneath the heading "OWN NODE" and that of the partner in the right column beneath the heading "PARTNER NODE" (see Figure 15, Output mask of the AMO KNTOP with overwritten MANAUT entry)
- **NWTOPTIM**: Polling Timer configured by AMO ZAND (see Section 25.3.2)
- **NODECD**: This is the physical node access code as configured individually in every node in the PNODECD parameter of the AMO ZAND. In the KNTOP output mask, the NODECD of the own node is displayed in the left column beneath the heading "OWN NODE" and that of the partner in the right column beneath the heading "PARTNER NODE" (see Figure 15, Output mask of the AMO KNTOP with overwritten MANAUT entry). NODECD can also be designated as a node number, making it a **number** that is thus interpreted by the "Least Cost Routing" mechanism.

  IMPORTANT: If the feature is activated, an open numbered LCR route and a dialing pattern with its physical node access code must be configured in every network node for every partner node (adjacent node). The LCR bundle (AMO LDAT) need only be specified for formal reasons and is not evaluated. Please check whether the physical node figures are already configured in the LCR for the "Route Optimization" feature. If so, no further settings are necessary.

- **PEN**: The PEN of the tie trunk circuit leading to the partner node is displayed under the heading "OWN NODE". Under the heading "PARTNER NODE", the PEN configured as an own node is displayed in the partner. This is always the output in the case of automatic entries (see description of the AUT field); the output field may be blank in the case of manual entries, as the PTPEN parameter is freely selectable in the add branch.

- **BCGR**: The B-channel group of the tie trunk circuit leading to the partner node is displayed under the heading "OWN NODE". Although the BCGR field is also available under the heading "PARTNER NODE", it is only valid in the case of manual entries for digital circuits. In the case of automatic entries, no value is displayed, regardless of the configuration in the partner node. This is because the answering mechanism is handled via the D-channel protocol. However, there is only 1 D-channel for all B-channel groups, meaning that no assignment can be determined in this context. The field remains blank in the case of manual entries for analog circuits and of automatic entries.
- **TGRP**: The number of the trunk group to which the tie trunk circuit or the B-channel group belongs in the own node.
- **OVRD**: 3 possibilities:

  1) Display field is blank: This can only involve an automatic entry (see description of the AUT field) that was never based on a manual entry.

  2) MANONLY: The entry marked as such is manual, i.e. is realized with the AMO KNTOP. It cannot be overwritten automatically.

  3) MANAUT: Although the entry marked as such was originally made manually, it can be overwritten automatically. Whether or not this is the case can be derived from the AUT display field (if checked, it has been overwritten).
- **AUT**: If this display field is checked, it involves an automatically created entry. All information regarding the partner node has been provided by the node itself. The partner node is actually connected and "live", i.e. it responds to the messages sent at the polling intervals. Automatic entries can also be deleted by the AMO KNTOP.

  If the partner node fails to respond repeatedly, it is automatically deleted and no longer displayed, even if it was originally created with MANAUT.

5.5.3.4 Diagnostic options

For diagnostic purposes, the option exists of marking a line / B-channel group with the AMO KNTOP for the automatic reporting procedure. Command example:

```
STA-KNTOP:PEN=1-2-25-0,BCGR=4;
```

This only works with CorNet-NQ lines with Segmentation=8, as only these support the reporting procedure. If the line is marked, an automatic entry is created for this line in the partner table upon the first successful call via this line (regardless of whether this involves transit or terminating traffic).

The command:

```
DIS-KNTOP:PEN=1-2-25-1,BCGR=1,FORMAT=START;
```

Allows you to query whether the line is marked. In this context, it is irrelevant whether the line was marked manually via AMO or automatically during a polling procedure.

5.5.3.5 Regenerate

Only manual entries in the partner table are regenerated with the AMO KNTOP. If a MANAUT entry has been overwritten by an automatic entry, it is no longer regenerated. In other words, if you find that the AUT field is checked when

performing a query with KNTOP, it involves an automatic entry that is not regenerated.

5.5.3.6 Switching the Tie Trunk Circuits On and Off

When switching off tie trunk circuits (analog or digital), the AMO DSSU (regardless of the parameter OFFTYPE) leaves the line marking unchanged. In contrast, when switching on or restarting a tie trunk circuit with the following properties (regardless of the parameter ONTYPE), the line marking is set for all configured B-channel groups:

- The tie trunk circuit must be assigned the CorNet-NQ protocol (AMO TDCSU, parameter PROTVAR))
- The CorNet-NQ protocol must be configured with Segmentation 8 (AMO TDCSU, parameter SEGMENT)
- The Polling Timer must be configured (AMO ZAND, parameter NWTOPTIM > 0)

This results in the automatic detection of the partner node being started faster when the feature is activated.

The AMO TDCSU, which likewise switches circuits off and on, acts in exactly the same way as described previously for the AMO DSSU.

5.5.4 Generation (Example)

- Check that sufficient memory is configured for the partner table and adjust it if necessary. This can be done via the EXEC command, which configures the standard value on a system-specific basis, or via an ADD command:

  ```
  DIS-DIMSU:TYPE=ALL, PARAM=PARTNODE;

  EXEC-DIMSU:FEASET=DEFAULT;

  ADD-DIMSU:PARTNODE=100;
  ```

- Configure own and partner node access codes in the digit analysis.

  Closed numbering scheme:

  ```
  ADD-WABE:CD=808902, DAR=NETW, CHECK=NO;

  ADD-WABE:CD=808903, DAR=NETW, CHECK=NO;

  ADD-WABE:CD=808904, DAR=NETW, CHECK=NO;
  ```

  Or open numbering scheme:

  ```
  ADD-WABE:CD=808901, DAR=OWNNODE;

  ADD-WABE:CD=808902, DAR=TIE, CHECK=NO;

  ADD-WABE:CD=808903, DAR=TIE, CHECK=NO;
  ```

```
ADD-WABE:CD=808904, DAR=TIE, CHECK=NO;
```

Configure own physical node number and node access code in the central system data:

```
CHA-ZAND:TYPE=ALLDATA, PNNO=10-89-100, PNODECD=808901;
```

- Check whether the feature is activated and, if necessary, adjust the polling times:

```
DIS-ZAND:TYPE=ALLDATA3;

CHA-ZAND:TYPE=ALLDATA3, NWTOPTIM=xx;
```

(xx > 0, corresponds to polling time in seconds)

- Configuring trunk groups, tie trunk circuits, LCR for open/closed numbering, etc. To this end, the corresponding FUEs, i.e. "Feature Usage Examples" (e.g. LCR, number modification...) must be taken into account. Use the default NWMUXTIM in AMO TDCSU whenever possible. However, in exceptional cases in which, for example, MUX functionality will never be required, use the following:

```
CHA-TDCSU:PEN=1-2-25-1, DEV=S2CONN, BCGR=1, NWMUXTIM=0;
```

- Configure LCR for the physical node access codes; the important factor here is that the dial pattern is entered in the LCR for **every** partner node access code (check whether it may already have been configured for the path optimization).

Closed numbering scheme:

```
ADD-RICHT:MODE=CD, LRTE=400, CD=40, CPS=0, SVC=SPVH,
 NAME=TO NODE 400,
TGRP1=40, DESTNO=40, DNNO=1-89-400, ROUTOPT=YES,
 PDNNO=10-89-400;

ADD-LODR:ODR=1, CMD=NPI, NPI=UNKNOWN, TON=UNKNOWN;

ADD-LODR:ODR=1, CMD=ECHO, FIELD=1;

ADD-LODR:ODR=1, CMD=END;

ADD-LODR:ODR=1, INFO="CLOSED NUMBERING UNKNOWN";

ADD-LDAT:LROUTE=400, LSVC=VCE, LVAL=1, TGRP=40, ODR=1,
 LAUTH=1,
CARRIER=9, ZONE=EMPTY, LATTR=NONE;
```

Or open numbering scheme:

```
ADD-RICHT:MODE=LRTENEW, LRTE=40O, NAME=TO NODE 400,
 TGRP=40,
DNNO=1-89-400, ROUTOPT=YES, PDNNO=10-89-400;

ADD-LODR:ODR=10, CMD=ECHO, FIELD=2;

ADD-LODR:ODR=10, CMD=END;

ADD-LODR:ODR=10, INFO="OPEN NUMBERING";
```

```
ADD-LDAT:LROUTE=400, LSVC=ALL, LVAL=1, TGRP=40, ODR=10,
 LAUTH=1,
CARRIER=9,  ZONE=EMPTY, LATTR=NONE;

ADD-LDPLN:LDP=808904-T, LROUTE=400, LAUTH=1;
```

- Initiate manual entries (if necessary) in the partner table:

```
ADD-KNTOP:PEN=1-2-25-1, BCGR=1, PTNAC=808904,
 PTNNO=10-89-400,
OVRD=MANONLY;
```

- Querying the partner table, for example before the MANAUT entry is overwritten by an automatic entry. For partner node 1-2-200, an automatic entry has already been realized:

```
DIS-KNTOP;

Output: (Output mask (long format) of the AMO KNTOP
+-----------------------------------|-----------------------------
+

| OWN NODE                          | PARTNER NODE
                        |

+-----------------------------------|-----------------------------
+

| NNO: 10- 89-100 NWTOPTIM:   20 SEC  |
                        |

| NODECD: 808901                    |
                        |

+-----------------------------------|-----------------------------
+

| PEN: 1- 2- 25-  1    BCGR:  1     TGRP:  40
         NWMUXTIM:  10 |

| OVRD:                AUT : X       --> NNO:  10-
 89-400                      |

|                                     |  NODECD: 808904
                        |

|                                     |  PEN: 1- 2- 79-
 1          BCGR:      |

+-----------------------------------|-----------------------------
+
```

Output mask (long format) of the AMO KNTOP

- In this example, the original MANAUT entry is overwritten by an automatic entry after a certain time (e.g. because the partner node was upgraded to OpenScape 4000). In this case, the output presented in Figure 15, Output

mask of the AMO KNTOP with overwritten MANAUT entry is displayed (differences are highlighted):

```
DIS-KNTOP;

Output: (Output mask of the AMO KNTOP with overwritten
 MANAUT entry)
+-------------------------------------|-----------------------
+

| OWN NODE                            | PARTNER NODE
                         |

+-------------------------------------|-----------------------
+

| NNO:  10- 89-100 NWTOPTIM:    20 SEC|
                         |

| NODECD: 808901                       |
                         |

+-------------------------------------|-----------------------
+

| PEN: 1- 2- 25-  1    BCGR:  1     TGRP:  40
         NWMUXTIM:  10 |

| OVRD: MANONLY        AUT : -       --> NNO:  10-
 89-400                       |

|                                       |  NODECD: 808904
                         |

|                                       |  PEN: 1- 2- 79-
 1           BCGR:     |

| OVRD: MANAUT         AUT : X       --> NNO: 1-  2-300
                         |

|                                       |  NODECD: 7018
                         |

|                                       |  PEN: 1- 2-109-0
            BCGR:      |

+-------------------------------------|-----------------------
+
```

Output mask of the AMO KNTOP with overwritten MANAUT entry

5.5.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
DIMSU	TYP	d	=NETZ, Zweig für PARTNODE Konfiguration
	TYPE	e	=NETWORK, branch for PARTNODE configuration
	PARTNODE	d	max. Anzahl der Partnerknoten (Nachbarknoten)
	PARTNODE	e	max. number of partner nodes (adjacent nodes)
DSSU	TYP	d	=LAGE: Aus- und Einschalten bzw. Restart eines Quersatzes
	TYPE	e	=PEN: Deactivate, Activate or Restart a Tie Line
	LAGE1	d	Lage 1 des Quersatzes
	PEN1	e	Peripheral Equipment Number 1 of a Tie Line
	LAGE2	d	Lage 2 des Quersatzes
	PEN2	e	Peripheral Equipment Number 2 of a Tie Line
KNTOP	LAGE	d	Lage im eigenen Knoten
	PEN	e	Peripheral Equipment Number in own node
	BKGR	d	B-Kanal-Gruppe im eigenen Knoten
	BCGR	e	B Channel Group in own node
	PTKNKZ	d	Knotenkennzahl des Partnerknotens
	PTNAC	e	Node Access Code of adjacent partner node
	PTKNNR	d	Knotennummer des Partnerknotens
	PTNNO	e	Node Number (Node Id) of adjacent partner node
	PTLAGE	d	Lage im Partnerknoten
	PTPEN	e	Peripheral Equipment Number in adjacent partner node
	PTBKGR	d	B-Kanal-Gruppe im Partnerknoten

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	PTBCGR	e	B Channel Group in adjacent partner node
	OVRD	d	Override-Steuerung manuell/ automatisch
	OVRD	e	Override control manual / automatic
	TYP	d	Typ des zu löschenden Eintrags
	TYPE	e	Type of entry to be deleted
	FORMAT	d	Ausgabeformat (lang oder kurz)
	FORMAT	e	Format of output (long / short)
TDCSU	NWMUXTIM	d	MUX-Timer (Zeitfenster für Partnerknoten, die über MUX angeschlossen sind)
	NWMUXTIM	e	MUX-Timer (time window for partner nodes connected via MUX)
	PROTVAR	d	Protokollvariante, z.B. CorNet-NQ (ECMA1, ECMA1R, ECMAV2, ECMAV2R, PSS1V2, PSS1V2R)
	PROTVAR	e	Protocol variant , e.g. CorNet-NQ (ECMA1, ECMA1R, ECMAV2, ECMAV2R, PSS1V2, PSS1V2R)
	SEGMENT	d	Segmentierung der Layer 3 Meldungen
	SEGMENT	e	Segmentation of Layer 3 messages
WABE	RNR	d	Angabe der Knotenkennzahl (Knotenrufnummer)
	CD	e	Access Code
	KZP	d	Kennzahlpunkt: =EIGENKZ: Eigene Knotenkennzahl einrichten Diese ist auch mit AMO ZAND, Parameter PKNOTKZ im eigenen Knoten einzurichten. = QUER: Querkennzahlen für alle Partnerknoten (Nachbarknoten) einrichten. Dort muss die Knotenkennzahl mit AMO ZAND, Parameter PKNOTKZ eingerichtet sein.

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	DAR	e	Digit analysis result: = OWNNODE: Own node acces code configuration it has to be configured also by AMO ZAND, parameter PNODECD = TIE: Tie line configuration for all adjacent partner nodes. At each partner node, the access code has to be configured by AMO ZAND, parameter PNODECD
ZAND	TYP	d	Typverweigung: =DATENALL: Zweig für PKNOTKZ, PKNNR = DATEN3: Zweig für NWTOPTIM
	TYPE	e	Type branch: = ALLDATA: Branch for PNODECD, PNNO = ALLDATA3: Branch for NWTOPTIM
	PKNOTKZ	d	Einstellen der eigenen physikalischen Knotenkennzahl (Knotenrufnummer)
	PNODECD	e	Configuration of own physical Node Access Code
	PKNNR	d	Einstellen der eigenen physikalischen Knotennummer
	PNNO	e	Configuration of own physical Node Number (Node Id)
	NWTOPTIM	d	Polling Timer für das Update der Partnertabelle
	NWTOPTIM	e	Polling Timer for updating the Partner Table

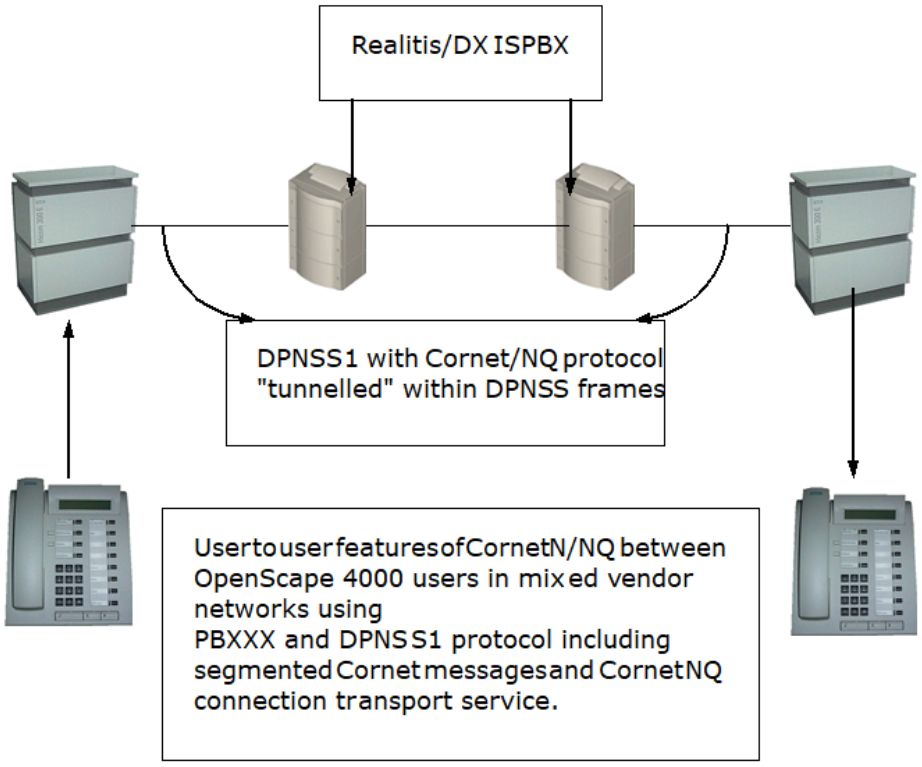
5.6 Cornet NQ Interworking with DPNSS1

5.6.1 Feature Description

With the feature Cornet NQ interworking with DPNSS1 the gateway board is integrated in OpenScape 4000 Loading, Administration and Dependability concept.

The peripheral board serves as a protocol gateway between Cornet NQ (OpenScape 4000 internal protocol) and DPNSS1 protocol (private network protocol in UK; ISDX; 'Realitis' migration). It works also in transit networks between OpenScape 4000 switches with DPNSS1 switches as transit nodes.

The board loadware translates the CornetN/Cornet NQ protocol into DPNSS1 and vice versa or hides the CornetN/Cornet NQ protocol in DPNSS1 frames for transit function and vice versa (tunneling function). The board also supports conversion of Cornet N into DASS2 protocol for use as a central office interface in the UK .



5.6.2 Application Field of PBXXX

The PBXXX gateway module is used to link the OpenScape 4000 system to private systems and networks via DPNSS1 or public exchanges via DASS2. With PBXXX it is possible to link the OpenScape 4000 system with:

- iSLX, iSDX, EMS 601 or other DPNSS based PBX systems via DPNSS1 protocol or
- public exchanges via DASS2 protocol
- other PABX systems via DPNSS1 protocol if certificated.

DPNSS1 (Digital Private Network Signaling System No. 1) is a British Telecom (BT) standard private network protocol used on many PBX systems, mostly in the UK, although it is also supported in many other countries. The DPNSS1 specification is a published standard in the United Kingdom.

IMPORTANT: Most DPNSS1 implementations of the various PBX vendors are a subset of the global DPNSS specification

(BTNR188). Cooperation with other vendor PBXs must be tested first.

DASS2 (Digital Access Signaling System No 2) describes the standard interfaces of the British ISDN access.

5.6.3 PBXXX Board

CorNet -N/NQ-DPNSS1 Gateway allows one of the following functions:

- connection to other PBXs supporting the DPNSS1 protocol
- connection to DPNSS based Voice Mail Systems
- connection to the public network supporting the DASS2 protocol
- transparent transmission supporting the CorNet-NQ/CorNet N protocol/QSIG protocol (e.g. Tunnelling of signalling messages)

The feature is available in the following configurations:

5.6.3.1 Partial Integration Ring Generator

- The board board is configured like a Ring Generator (RG) and is plugged in a peripheral slot of the OpenScape 4000. It only gets power from the OpenScape 4000 switch. No direct signalling and administration is supported.
- The connection to OpenScape 4000 is done via a separate DIUS2 board.
- In this configuration the board is loaded and administrated via V.24 interface from a separate PC (CDGM-Tool).
- This configuration only uses one circuit of the PBXXX i.e. 30 B channels

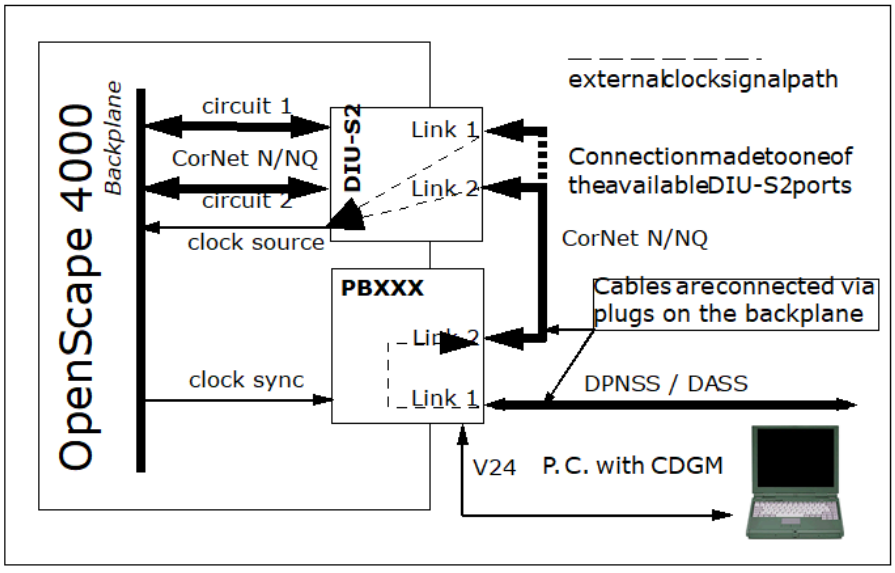


Figure 14: PBXXX - Partial-integration-RG

5.6.3.2 Partial Integration DIUS2

- The board is configured like a DIUS2 board and is plugged in a peripheral slot of the OpenScape 4000.
- The board is connected directly to the OpenScape 4000 backplane and supports the DIUS2 message interface.
- But the board is still loaded and configured via V.24 interface from a separate PC (CDGM-Tool).

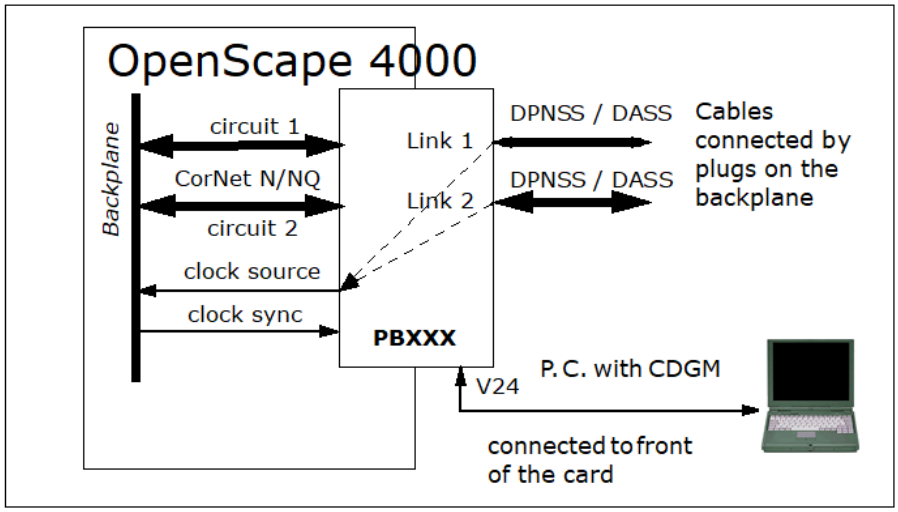


Figure 15: PBXXX - Partial-integration-DIUS2

5.6.3.3 Full-integration Solution

- The board is configured and is plugged in a peripheral slot of the OpenScape 4000.
- The board is connected directly to the OpenScape 4000 backplane and supports the DIUS2 message interface. Additionally, interfaces for loading, administration and debugging are added.
- The loading and administration process is now supported via OpenScape 4000. No separate PC is necessary any longer. The exception to this is in the initial configuration of the board when software known as the Eprom Extender has to be loaded into the board . Also it is possible to connect the

PC via V.24 to the board for special debugging purposes (this is limited to product specialists)

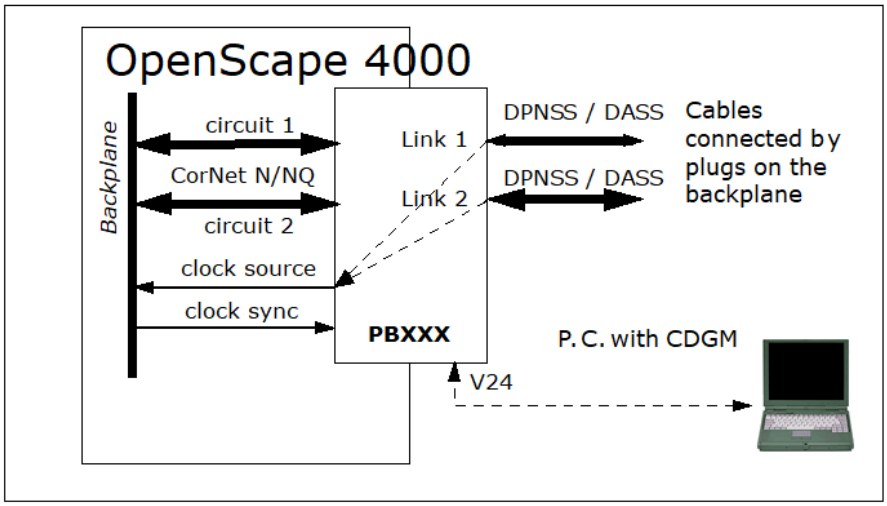


Figure 16: PBXXX - Full-integration

5.6.4 Feature Characteristics

- Changes in the configuration data made by AMO LWPAR and AMO TDCSU will become only effective on the board after switching off/on the concerned unit. This will cause loading the new configuration data to the board:
- Switch off/on circuits with AMO DSSU: Concerned Parameters in AMO LWPAR are signed as 'C' ('Circuit').
- Switch off/on board with AMO BSSU: Concerned Parameters in AMO LWPAR are signed as 'R' ('Restart the board') or 'B' ('Board'). Also the parameters which can only be changed by AMO TDCSU are listed here within the LWPAR block]
- A maximum of 50 loadware parameter blocks (LWPAR blocks) are available for PBXXX These data can be changed by AMO LWPAR per block.

B-channel negotiation:

- B Channel negotiation is set on the board. The PBXXX will use the channel requested by the OpenScape 4000 or DPNSS/DASS circuit involved. If this is not available due to collision or faults then the call setup is rejected with the appropriate cause .On the DPNSS side the channels are configured as X or Y. The Y channell will back off in the case of call collision.The distant end must have the B channel set to the opposite value as is normall for DPNSS. To the OpenScape 4000 the PBXXX in the case of call collision sends a message with "required circuit not available", the OpenScape 4000 then can select another B channel or not.Please pay attention to the COT parameter BCNE and TDCSU parameter CCHDL for the OpenScape 4000 trunk as these affect the way OpenScape 4000 handles B channel negotiation.
- In this way trunk groups and sub equipped configurations will function correctly on both sides of the PBXXX.The restriction here is that the same channels must be configured on either side e.g. if only DPNSS channels 1-10 are configured for use then OpenScape 4000 (Cornet N/NQ) channels 1-10 only must be configured.

Reference clock:

- 'Partial-integration-RG' solution: The OpenScape 4000 switch gets the reference clock over the backplane from the separate DIUS2 board and not directly from the board. The separate DIUS2 circuit therefore must not be configured as 'connected with PBXXX'.
- 'Partial-integration-DIUS2' solution: The OpenScape 4000 switch gets the reference clock over the backplane directly from the PBXXX board.
- 'Full-integration'solution: The OpenScape 4000 switch gets the reference clock over the backplane directly from the PBXXX board. In this situation the PBXXX circuit must be configured (via the CDGM tool) to retrieve the clock from the external DPNSS/DASS2 circuit.
- Command interface AMO LWCMD: With the 'Full-integration' solution the new AMO LWCMD (LoadWare CoMmanD) is available which supports a command interface between OpenScape 4000 service terminal and PBXXX board.

  With AMO LWCMD service personnel are able to send ASCII-command strings to the PBXXX board loadware and to receive ASCII-strings on the service terminal display. This command interface is developed for PBXXX system specialists (e.g. for debugging , for detailed fault diagnosis and for statistics). It is not service relevant. The AMO LWCMD therefore gets the AMO password class 3 (product specialist).
- AMO LWPAR has a branch, **TYPE=CDG** this allows the feature of the PBXXX to be configured in the fully integrated solution.
- The CDGM tool is to be used for the partialy integrated solutions.It is also used for upgrading the extender and loadware for partial integration solutions or just the extender software in the fully integrated solution. In all cases it can be used to monitor configuration data and other items such as link status.

5.6.5 Configuration

Configuration and maintenance can be done via the tool OpenScape 4000 Expert Access and Hicom One Tool (only possible in the fully integrated option) and/or via the V24 interface.

Additionally "Execute Commands" can be sent from OpenScape 4000 service terminal (V24 interface) to the board, also when the board is accessible by OpenScape 4000. By means of execute commands special data can be sent to board (AMO LWCMD)

5.6.5.1 Software and Data Base Loading (Flash Loading Concept)

The software loading is done by the EPROM extender program. The EPROM extender program is factory-preloaded, but can be reloaded on site by means of the CDGM program.

When PBXXX is powered-up or restarted, the bootstrap EPROM checks if the EPROM extender program on the board is still present. When no extender is available, the PBXXX will wait for the CDGM program to download the extender.

In the PBXXX flash memory, an area is available where some miscellaneous data can be saved. One item (LW-source) will indicate from where the PBXXX will get the loadware and database : from OpenScape 4000 AMO or CDGM. If

this flash area is not initialized, OpenScape 4000 will be assumed as default source. (Therefore the board will default to load from the OpenScape 4000 unless it has been configured as a partial integration board, in which case it can only be loaded via the CDGM tool)

- LW-source = OpenScape 4000

  PBXXX will first activate the backplane communication and waits for a message from OpenScape 4000. Software and database are loaded from OpenScape 4000. On receipt of the configuration data, PBXXX will create all the necessary software components to handle calls. Configuration data will be saved in flash.
- LW-source =CDGM

  download software and database via V.24 port (using CDGM tool).

  In this case the PBXXX will check whether it has a valid database or loadware stored in the flash RAM. If so, the PBXXX loads the database/ loadware from flash which results in the creation of all the software components that are necessary to handle calls. If no database/loadware is available in flash, the PBXXX will wait for a database/loadware download from the CDGM tool. Configuration data received from the OpenScape 4000 will be ignored.

The EPROM extender program will first read this 'LW-source' parameter from flash. Via the CDGM tool the PBXXX will allow to change this parameter for a period of max 10 secs (this waiting period will be skipped in case no terminal or modem is connected to the PBXXX board in order to speed-up the start-up time). If nothing is entered, the indication from Flash (or default) is used as LW-source. A LW-source update received from CDGM will be saved in flash and used afterwards.

5.6.5.2 PBXXX Partial Integration RG

The CDGM tool is required for PBXXX configuration and debugging. The CDGM PC also provides the loadware for the PBXXX and is used to upgrade the extender. The PBXXX board will receive all the configuration data and maintenance commands via the V24 port.

5.6.5.3 PBXXX Partial Integration (DIU-S2-Emulation)

This is a configuration of PBXXX, where the PBXXX takes power from the backplane. In addition the PBXXX can receive a reference clock from the OpenScape 4000 backplane, or supply a reference clock to the OpenScape 4000 backplane.

In this case the PBXXX emulates the DIU-S2 functionality: It looks like a DIU-S2 to the OpenScape 4000 and communicates with the OpenScape 4000 backplane's D-channel signalling highway using layer 3 CorNet-N/NQ messages. In addition maintenance messages are passed between the PBXXX and the OpenScape 4000 backplane.

The CDGM tool is required for PBXXX configuration and debugging.The CDGM PC also provides the loadware for the PBXXX. The PBXXX board will receive all the configuration data and maintenance commands via the V24 port.

Features:

- PBXXX will always synchronize on the PCM clock from the OpenScape 4000 backplane. Additionally, the PBXXX will be able to provide OpenScape 4000 with the clocksources derived from the incoming data stream from the DPNSS1 or DASS links. These clocksources can be switched on and off under OpenScape 4000 control by means of DIU-S2 backplane messages.
- Between B channels on the Network side (DPNSS/DASS) a fixed relationship exists (see B channel negotiation). Timeslot connections are made on a per call basis, however no physical connection will be established until OpenScape 4000 assigns a timeslots on the backplane for the selected B-channel.

5.6.5.4 PBXXX Full Integration

This product configuration is characterized by the following:

- The PBXXX takes power from the backplane.
- The PBXXX can receive a reference clock from the OpenScape 4000 backplane, or supply a reference clock to the OpenScape 4000 backplane.
- The PBXXX emulates the DIU-S2.
- The PBXXX loadware resides on the OpenScape 4000 and is loaded on to the card automatically on startup if loadware in the OpenScape 4000 is found to be different to that on the board
- Configuration for the PBXXX is done using AMOs on the OpenScape 4000. PBXXX configuration is stored on the OpenScape 4000 database.
- Limited PBXXX debugging can also be done by AMO.
- The option of using a separate CDGM tool for PBXXX debug/ tracing is still available.
- Administation and maintenance of the PBXXX can either be done by AMO or by using the CDGM tool. But can not be done by AMO and the CDGM tool in parallel or at the same time. Within the PBXXX loadware it is configurable (via execute commands sent with AMO or via CDGM) which internal errors are sent to the OpenScape 4000

In the fully integrated option, the PBXXX board will receive the configuration data from OpenScape 4000 directly on start-up. During start-up, each equipped circuit on the PBXXX will receive from OpenScape 4000 a message containing a datablock with configuration parameters. These PBXXX specific parameters are configured by OpenScape 4000 using different AMO commands (AMO LWPAR/AMO TDCSU).

Changing configuration data on the PBXXX board via the V.24 interface while the board is in the 'full integration configuration' leads to inconsistent OpenScape 4000 Database for PBXXX. Therefore this manipulation is not allowed in normal operation but only for diagnostics purposes (executed by system specialists).

Features:

- PBXXX will always synchronise on the PCM clock from the OpenScape 4000 backplane. Additionally, the PBXXX will be able to provide OpenScape 4000 with the clock sources derived from the incoming data stream from the DPNSS1 or DASS links. These clock sources can be switched on and off under OpenScape 4000 control by means of DIU-S2 backplane messages.
- Between B channels on the Network side (DPNSS/DASS) a fixed relationship exists (see B channel negotiation). Timeslot connections are made on a per call basis, however no physical connection will be established

until OpenScape 4000 assigns a timeslots on the backplane for the selected B-channel.
- Circuit 0 or 1 appear in the REFTA table as possible clock sources.

5.6.6 Administration/Maintenance

The administration and maintenance possibilities depend on the PBXXX configuration mode. For the fully integrated option, administration and maintenance can be done in the same way as the OpenScape 4000 administration, via the OpenScape 4000 Expert Access and Hicom One Tool. Additionally the CDGM tool can be used for maintenance functions via the V24 port.

For partial integration modes administration and maintenance can only be done using the CDGM. Additionally using AMO LWCMD (EXEC-LWCMD) "Execute Commands" can be sent from OpenScape 4000 service terminal to a fully integrated board ,these allow:

- Trace activate/deactivate commands (Trace results are received via DH and AMO TRACS)
- Dump activate commands
- Other commands (e.g. alarm selection)

Results from execute Commands are displayed on OpenScape 4000 service terminal:

- Dump result data
- Error and alarm information stored in LW buffers
- Aknowledges (e.g. "OK")

5.6.7 Service Information

- No transmission of node number from ISDX / Realitis System.

  COT Parameter **LOKN** has to be set to the DIUS2 and a node number has to be given to the trunk in AMO TDCSU.
- No transmission of **LBER** from ISDX / Realitis System.
  - COT Parameter **OLCR**/**OLCRD** has to be set to the DIUS2.
  - A COS have to be assigned to the DIUS2.
- The CORNV33 protocoll can be used for DPNSS1 and DASS.
- Sychronisation of the OpenScape 4000 is possible via the PBXXX.

5.6.8 AMO Information

AMO LWPAR

A branch of AMO LWPAR is available to deal with the full integration configuration of PBXXX, PBXXX.(The partial integration configurations still use the existing DIUS2 branch of the AMO) On initialistaion of the database data blocks are created with default values and therefore there is no ADD function for the amo.To reset a LWPAR block to default a DEL function exists.When changing parameters two sub branches of the AMO exist under the parameter

CDGTYPE, these are CONF and TIMER. these are displayed together in the display branch of the AMO as below.

```
 +-------------------------------------------------------------------
+
    | LOADWARE PARAMETERS   CIRCUIT TYPE: CDG     SOURCE:DB
    BLOCK: 0   |

 +-------------------------------------------------------------------
+
    |  [R]UNWD   = DPACN     [R]PATTERN = 213
               |
    |  [C]BCHNEG = Y         [C]CRC4C   = N
 [C]CRC4REP = N       |
    |  [C]TEMPSIG= Y         [C]NSITR   = Y
 [C]NSIOUT  = Y       |
    |  [C]CDGCF  = Y         [C]CONVBN  = N
 [C]TIDOP   = Y       |
    |  [C]C3CONF = Y         [C]CONACK  = Y
 [B]LSCF    = N       |
    |  [C]NSIMSGS= 150       [C]SADRTM  = NSAP
 [C]MAXTMS  = 500     |
    |  [C]RESTLNK= Y         [C]RESTALL = Y
               |
    |  [C]AROB   = N         [C]SCCONF  = N
 [C]ATCPN   = 11      |
    |  [C]ICPN   = 12        [C]APCPN  = 13
 [C]DASSCPN  = 14      |
    |  [C]T301   = 180 SEC   [C]T302    = 10   SEC
 [C]T303    = 4   SEC |
    |  [C]T304   = 15  SEC   [C]T305    = 30   SEC
 [C]T308    = 4   SEC |
    |  [C]T309   = 90  SEC   [C]T310    = 10   SEC
 [C]T313    = 4   SEC |
    |  [C]T314   = 4   SEC   [C]T316    = 120  SEC
 [C]T322    = 4   SEC |
    |  [C]TBID   = 5   SEC   [C]TDPNSSC = 500  MSEC
 [C]TROPTBR = 10  SEC |
    |  [C]TWEOS  = 60  SEC   [C]TAMOST  = 60
 [C]TROPTNR = 30  SEC |
    |  [C]DEFID   = B010     [C]TSABMR  =   200 MSEC
 [C]TAROB   = 10  SEC |
    |  [R]PROT    = DPNSS    [C]VMSYSTAD = 0
               |
    |  [R]BCHKONF = 16&&30
               |
    |  [R]EQVIRC  = 1&&30
               |
    |  [R]VCHCONF = 16&&30
               |
    |                            RES3 = 0     RES4 = 0
 RES5 = 0       |
    |  DEV  = INDEP              TIPL = 10
 IPLDS = A       |
    |  LCOSMAP(Y=ENABLED,N=DISABLED) = N          DEFPASSW
 = 9999         |
```

```
    |  INFO =
               |

 +-------------------------------------------------------------------
+
    | DEFC: CIRCUIT SPECIFIC DATA WITHOUT BOARD LEVEL
 SWITCHING           |
    |       (CIRCUIT LEVEL SWITCHING BY AMO-DSSU
 NEVERTHELESS REQUIRED)   |
    | DEFR: CIRCUIT SPECIFIC DATA WITH BOARD LEVEL
 SWITCHING              |
    |       (PLUS CIRCUIT LEVEL SWITCHING BY AMO-DSSU
 REQUIRED)           |
    | DEFB: BOARD SPECIFIC DATA
               |
    |       (BOARD LEVEL SWITCHING REQUIRED)
               |

 +-------------------------------------------------------------------
+
 AMO-LWPAR-218       LOADWARE PARAMETERS FOR NETWORKING
 MODULES
 DISPLAY COMPLETED;
   <
```

The explanations of DEFC DEFR and DEFB refer to the functions which must be restarted following a change of the parameter.This is indicated by the letter in parenthisis adjacent to the parameter

The parameters in the block are defined as follows: **TYPE=CDG**

Table 3: LWPAR block initialization values

Parameter	Initialization/ default	Definition/Options
The following are in the branch **CDGTYPE = CONF**		
Idle code (PATTERN)	213 (D5H)	BYTE in decimal
User Network Definition (UNWD) DPACN DPNSS A Cornet Network DPACU DPNSS A Cornet User DPBCN DPNSS B Cornet Network DPBCU DPNSS B Cornet User	DPACN	DPACN DPACU DPBCN DPBCU
Protocol (PROT)	DPNSS	DPNSS DASS
Equipped B channels - BitMap	All equiped	Bitmap, 1 = equiped.

Parameter	Initialization/ default	Definition/Options
DPNSS X/Y B-Channels (BCHCONF)	16-30	Channels configured here are those channels that are required to be set as Y, those not entered are automatically configured as X ie 1-15 X, 16-30 Y
DPNSS virtual channels (EQVIRC)	30	can sub equip
DPNSS X/Y virtual channels (VCHCONF)	16-30	Channels configured here are those channels that are required to be set as Y, those not entered are automatically configured as X ie 1-15 X, 16-30 Y
Msg size NSI to non NSI (NSIMSGS)	300	RANGE (100:2048)
DASS-CORNET subaddress NPI (SADRTM)	NSAP (=0)	can have user specified
DPNSS transit msg size max (MAXTMS)	500	RANGE (0-2048)
CORNET: Restart link at startup (RESTLNK)	YES	YES/NO
DPNSS/DASS:Restart LAPs at startup (RESTALL)	YES	YES/NO
CORNET-N(Q): B-Channel negotiation (BCHNEG)	YES	YES/NO
CORNET-N(Q): CRC4 (CRC4C)	NO	YES/NO
DPNSS/DASS: CRC4 (CRC4REP)	NO	YES/NO
Temporary signaling connection (TEMPSIG)	YES	YES/NO
NSI CORNET-NQ transit (NSITR)	YES	YES/NO
Insert NSI DPNSS outgoing (NSIOUT)	YES	YES/NO

Parameter	Initialization/ default	Definition/Options
PBXXX transit working on Call Forward (CDGCF)	YES	YES/NO
Conversion back Notify from CORNET-N (CONVBN)	NO	This should be yes when connected to Realitis/DX
DPNSS trunk identity option (TIDOP)	NO	YES/NO
3-party conference (C3CONF)	YES	YES/NO
Connect Ack sent by Protocol Han dler (CONACK)	YES	YES/NO
Loadware saved compressed in Flash (LSCF)	NO	YES/NO
ROP,Default call id length when used with Cornet NQ (DEFID)	B001	B001=1 digit, B010=2 digits, B011= 3digits and B100= 4 digits
Dass operator number (DASSOPN)	0	digit string
Kind of device on trunk (DEV)		CDGCOD CDGCONN
Service information (INFO)		Max. of 50 positions
COS mapping. (LCOSMAP)	NO	YES(enabled)/ NO(disabled)
Diversion Activation/Deactivation default password (DEFPASSW)	9999	0 to 6 digits. 'Digit values 0 to 9
The following are in the branch **CDGTYPE = CONF2**		
Analogue trunk call priority(ATPCN)	12	1 - 16
Internal call priority (ICPN)	11	1 - 16
Analogue PSTN (APCPN)	14	1 - 16
DASS call priority (DASSCPN)	13	1 - 16
AROB mapping enabled(AROB)	NO	YES/NO
Station controlled conference enabled (SCCONF)	NO	YES/NO

Parameter	Initialization/ default	Definition/Options
Voicemail system address (VMSYSTAD)	Empty - digit length = 0	digit string
The following are in the branch **CDGTYPE = TIMER**		
Callback interdigit timer (TBID)	5 seconds (= 0x4005)	WORD
ROPT release timer both end(TROPTBR)	10 seconds (= 0x400A)	WORD
ROPT release timer neither end release (TROPTNR)	30 seconds (= 0x401E)	WORD
DPNSS collision timer (TDPNSSC)	500 msec (= 0x0005)	WORD
Timer wait for EOS from CORNET (TWEOS)	60 seconds (= 0x403C)	WORD
DPNSS SABMR retransmission timer (TSABMR)	0 seconds (=0x4000)	WORD
T301 timer	180 seconds (=0x40B4)	WORD
T302 timer	10 seconds (=0x400A)	WORD
T303 timer	4 seconds (=0x4004)	WORD
T304 timer	15 seconds (=0x400F)	WORD
T305 timer	30 seconds (=0x401E)	WORD
T308 timer	4 seconds (=0x4004)	WORD
T309 timer	90 seconds (=0x405A)	WORD
T310 timer	10 seconds (=0x400A)	WORD
T313 timer	4 seconds (=0x4004)	WORD
T314 timer	4 seconds (=0x4004)	WORD
T316 timer	120 seconds (=0x4078)	WORD

Parameter	Initialization/ default	Definition/Options
T322 timer	4 seconds (=0x4004)	WORD
AMO supervise timer (TAMOST)	60 seconds (= 0x403C)	WORD
IPL timer (TIPL)	10 seconds	WORD
Intrusion level (IPLDS)	A	A = Allowed NA = Not-allowed
AROB timer (TAROB)	10 seconds	WORD
Reserved 3	0	WORD
Reserved 4	0	WORD
Reserved 5	0	WORD
The following are in the branch **CDGTYPE = MAPPING**		
Conversion between OpenScape 4000 ITR and Realitis trunk group number (TBL = DXTGITR)		DXTGPOS (0 - 31)
Conversion between OpenScape 4000 ITR and Realitis call barring group (TBL = TRGCBG)		TRG (0 - 15) CBG (0 - 127)
Conversion between OpenScape 4000 LCOSD and TAC value in DPNSS1 (TBL = LCOSDRRG)		LCOS (1 - 32) RRG (0 - 127)
Conversion between OpenScape 4000 LCOSV and TAC value in DPNSS1 (TBL = LCOSVRRG)		LCOS (1 - 32) RRG (0 - 127)

5.6.9 Generation (Example)

5.6.9.1 Configuration of 'Partial-integration-RG' solution

- Configuration of 'Partial-integration-RG' solution
- Configuration of DIUS2

  The DIUS2 is configured identical to other DIUS2 in system (e.g. for CORNET-NQ networks). The DIUS2-Loadware need not be informed by AMO LWPAR, that a PBXXX is connected to it. The OpenScape 4000 switch gets the reference clock directly from the DIUS2. Therefore if PBXXX is connected to a DIUS2, the LWPAR-Parameter **CDG=NO** has

to be configured for the DIUS2. AMO commands (applicable to an empty Database, important commands are shown bold):

Please pay attention to the functional id of the PBXXX

- Configuration of the PBXXX board as 'Ring Generator':

```
ADD-BCSU:MTYPE=RG, LTG=1, LTU=1, SLOT=67, PARTNO="Q6401-
X", FCTID=1;
```

- Configuration of DIUS2
  - DIMSU configuration for DIUS2 (all dimsu needed for DIUS2)

```
ADD-DIMSU:TYPE=ADMCC, CCIDXS=2000;

ADD-DIMSU:TYPE=BASIC, LODEN=2000, PRI=20, TRK=100,
 SG=100,
NWBCHL=600, CRCP=50, DPLNCD=800, ....;

ADD-DIMSU:TYPE=SYSTEM, PERMDL=100, ..;
```

  - Configuration fo LTG, LTU and DIUS2

```
ADD-UCSU:UNIT=LTG, LTG=1, SIPARTNO="Q2234-X ";

ADD-UCSU:UNIT=LTU, LTG=1, LTU=1, LTPARTNO="Q2248-X";
ADD-BCSU:MTYPE=DIU, LTG=1, LTU=1, SLOT=61,
 PARTNO="Q2096-X200",  LWVAR=0;
```

  - Basic configuration of LCR

```
ADD-WABE:CD=19, DAR=OWNNODE;

ADD-WABE:CD=16, DAR=TIE;

CHANGE-ZAND:TYPE=ALLDATA, NNO=100, NODECD=19;

ADD-COP:COPNO=5;

ADD-COT:COTNO=20;

ADD-BUEND:NO=30, TGRP=23, NAME="QV-DPNSS1";

CHANGE-LWPAR:TYPE=DIUS2, BLNO=2, CDG=N; /* CDG MUST BE
 SET TO "NO" */
```

  - Configuration of trunk (use a proper LCOSS and LCOSD to get the necerssary access and a node number)

```
ADD-TDCSU:OPT=NEW, PEN=1-1-061-00, BCGR=1, CCT="CDG-
DPNSS1",
COTNO=20, COPNO=5, LCOSV=1, LCOSD=1, PROTVAR=ECMAV2,
 DEV=S2CONN,
TGRP=23, LWPAR=2;
```

```
CHANGE-REFTA:TYPE=CIRCUIT, PEN=1-1-061-00, PRI=80;
```

OpenScape 4000 can accept the clock from DPNSS1 (depending on prio and error counters) And if the circuit is configured through CDGM to retrieve th clock from DPNSS/DASS

OR

OpenScape 4000 does not accept clock from DPNSS-Network but delivers it (PRIO=0) (for details see also Section 46.5.6, "Network Clock Supply"). OpenScape 4000 should always accept the clock from a DASS circuit and never deliver it.

5.6.9.2 Configuration of 'Partial-integration-DIUS2'

- Configuration of 'Partial-integration-DIUS2' solution
- Configuration of the PBXXX board as 'DIUS2' AMO commands (applicable to an empty Database, important commands are shown bold):
- Configuration of DIUS2
  - DIMSU configuration for DIUS2 (all dimsu needed for DIUS2)

```
ADD-DIMSU:TYPE=ADMCC, CCIDXS=2000;

ADD-DIMSU:TYPE=BASIC, LODEN=2000, PRI=20, TRK=100,
 SG=100,  NWBCHL=600, CRCP=50, DPLNCD=800, ....;

ADD-DIMSU:TYPE=SYSTEM, PERMDL=100, ..;
```

  - Configuration fo LTG, LTU and DIUS2

```
ADD-UCSU:UNIT=LTG, LTG=1, SIPARTNO="Q2234-X ";

ADD-UCSU:UNIT=LTU, LTG=1, LTU=1, LTPARTNO="Q2248-X";
ADD-BCSU:MTYPE=PER, LTG=1, LTU=1, SLOT=67,
 PARTNO="Q6401-X", FCTID=2;
```

  - Basic configuration of LCR

```
ADD-WABE:CD=19, DAR=OWNNODE;

ADD-WABE:CD=16, DAR=TIE;

CHANGE-ZAND:TYPE=ALLDATA, NNO=100, NODECD=19;

ADD-COP:COPNO=5;

ADD-COT:COTNO=20;

ADD-BUEND:NO=30, TGRP=23, NAME="CDG-DPNSS1";
```

  - Configuration of trunk (use a proper LCOSS and LCOSD to get the necerssary access and a node number)

```
ADD-TDCSU:OPT=NEW, PEN=1-1-067-00, BCGR=1, CCT="CDG-
DPNSS1",
COTNO=20, COPNO=5, LCOSV=1, LCOSD=1, PROTVAR=ECMAV2,
 DEV=S2CONN,
```

```
or S2COD ), TGRP=23, LWPAR=2; CHANGE-
REFTA:TYPE=CIRCUIT, PEN=1-1-067-00, PRI=80;
```

OpenScape 4000 can accept the clock from DPNSS1 (depending on prio and error counters) And if the circuit is configured through CDGM to retrieve the clock from DPNSS/DASS

OR

OpenScape 4000 does not accept clock from DPNSS-Network but delivers it (PRIO=0) (for details see also Section 46.5.6, "Network Clock Supply"). OpenScape 4000 should always accept the clock from a DASS circuit and never deliver it.

5.6.9.3 Configuration of 'Full-integration' solution

- Configuration of 'Full-integration' solution

  Configuration Sequence (example for empty Database, important commands are shown bold)
- Configuration of DIUS2
  - DIMSU configuration for DIUS2 (all dimsu needed for DIUS2)

    ```
    ADD-DIMSU:TYPE=ADMCC,CCIDXS=2000;

    ADD-DIMSU:TYPE=BASIC,LODEN=2000,PRI=20,TRK=100,SG=100,
     NWBCHL=600,CRCP=50,DPLNCD=800,....;

    ADD-DIMSU:TYPE=SYSTEM,PERMDL=100,..;

    ADD-UCSU:UNIT=LTG,LTG=1,SIPARTNO="Q2234-X ";

    ADD-UCSU:UNIT=LTU,LTG=1,LTU=1,LTPARTNO="Q2248-X";

    ADD-BCSU:MTYPE=PER,LTG=1,LTU=1,SLOT=67,PARTNO="Q6401-
    X",FCTID=3;
    ```
  - Basic configuration of LCR

    ```
    ADD-WABE:CD=19,DAR=OWNNODE;

    ADD-WABE:CD=16,DAR=TIE;

    CHANGE-ZAND:TYPE=ALLDATA,NNO=100,NODECD=19;

    ADD-COP:COPNO=5; ADD-COT:COTNO=20;

    ADD-BUEND:NO=30,TGRP=23,NAME="QV-DPNSS1";
    ```
  - Configuration of tie trunk (use a proper LCOSS and LCOSD to get the necerssary access and a node number)

    ```
    ADD-TDCSU:OPT=NEW,PEN=1-1-067-00,BCGR=1,CCT="CDG-
    DPNSS1",
    COTNO=20,COPNO=5,LCOSV=1,LCOSD=1,PROTVAR=ECMAV2 or
     CORNV33
    ```

```
(see service information),DEV=CDGCONN,TGRP=23,
 LWPAR=29;
```

– Configuration of central office trunk (use a proper LCOSS and LCOSD to get the necessary access and a node number)

```
ADD-TDCSU:OPT=NEW,PEN=1-1-067-00,BCGR=1,CCT="CDG-
DPNSS1",
COTNO=20,COPNO=5,LCOSV=1,LCOSD=1,PROTVAR=CORNV33
(see service information,DEV=CDGCOD,TGRP=23,
 LWPAR=29;

CHANGE-REFTA:TYPE=CIRCUIT,PEN=1-1-067-00,PRI=80
```

OpenScape 4000 can accept the clock from DPNSS1 (depending on prio and error counters)

OR

```
CHANGE-REFTA:TYPE=CIRCUIT,PEN=1-1-067-00,PRI=0
```

– OpenScape 4000 does not accept clock from DPNSS-Network but delivers it (PRIO=0) (for details see also PN Service Manual, chapter Networking, section Clock Supply) OpenScape 4000 should always accept the clock from a DASS circuit and never deliver it.

– If less than 30 B-Channels have to be configured (Example: B-Channel 1 to 8): commands see above, replace TDCSU command by:

```
ADD-TDCSU:OPT=NEW,PEN=1-1-067-00,BCGR=1,CCT="CDG-
DPNSS1",
COTNO=20,BCHAN=1&&8,COPNO=5,LCOSV=1,LCOSD=1,PROTVAR=ECMAV2
or CORNV33 (see service
 information),DEV=CDGCONN,TGRP=23,LWPAR=29;
```

– If Loadware Parameters differ from standard initialization:

```
CHANGE-
LWPAR:TYPE=CDG,BLNO=29,CDGTYPE=CONF,PROT=DACORN,...;
```

description of all 55 loadware parameters can be found in the AMO description part of the service manual.

IMPORTANT: The changed LWPAR values are **not** transferred immediately to the board. This happens if the board / circuit is switched off / on. The user is informed by an advisory message.

- Transmit changed LWPAR values to the LW (according to advisory message of AMO LWPAR):
  - If board specific data have been changed:
    `RESTART-BSSU:LTG=1,LTU=1,SLOT=67;`
  - If circuit specific data have been changed (according to advisory message of AMO LWPAR):
    `RESTART-BSSU:LTG=1,LTU=1,SLOT=67;`
  - If another loadware block is to be assigned to a TDCSU circuit (e.g. replace block 29 by block 15). Note that new LWPAR values are transferred to LW only if a restart is initiated:
    ```
    CHANGE-
    TDCSU:PEN=1-1-067-00,DEV=CDGCONN,BCGR=1,LWPAR=15;
    RESTART-BSSU:LTG=1,LTU=1,SLOT=67;
    ```
- Handling of B-Channel negotiation
  `CHANGE-TDCSU:PEN=1-1-67-0,DEV=CDGCONN,BCGR=1,BCNEG=Y;`

  `CHANGE-LWPAR:TYPE=CDG,BLNO=29,CDGTYPE=CONF,`**`BCHNEG=Y;`**

  BCHNEG=Y is the default setting. With this configuration the OpenScape 4000 takes over the proposed B channel in case of a collision/fault. **This is the recommended configuration!**

  However the B channel negotiation will be fixed on the PBXXX so that it is not possible to perform a B channel negotiation between OpenScape 4000 and PBXXX. Is a B channel in OpenScape 4000 available the connection will be established. Is no B channel available the connection will be rejected.
  `CHANGE-TDCSU:PEN=1-1-67-0,DEV=CDG,BCGR=1,`**`BCNEG=N;`**

  BCHNEG=N cause the OpenScape 4000 to release the call in any case of call collision independant of LWPAR settings.
  `CHANGE-TDCSU:PEN=1-1-67-0,DEV=CDGCONN,BCGR=1,BCNEG=Y;`

  BCHNEG=Y is the default setting. This setting means that the PBXXX does not select any new B channel in the case of a collision. The PBXXXPBXXX initiates the call.

5.6.9.4 Usage of AMO LWCMD command interface:

The AMO LWCMD can be used to send so called 'EXECUTE' commands to the loadware and display the response data (e.g. dump data) at the OpenScape 4000 service terminal. The 'EXECUTE' commands are described in a separate document.

```
EXEC-LWCMD:LTU=1,SLOT=67,TYPE=CDG,CMD="... here enter
 EXECUTE
cmd ...",TIMER=30;
```

The AMO supervise timer is set in this example to 30 seconds. The EXECUTE command is passed transparently to LW and if it is coupled with response data, data are displayed in ASCII format.

5.6.9.5 COP for PBXXX

```
ADD-COP:COPNO=110,PAR=EOD&SACK&RLSB&RLSA&SPTR&TIM3&ASEG;
```

5.6.9.6 Protocol changes for PBXXX to activate the ASEG COP-parameter

```
CHA-PRODE:KIND=PD, PDNAME=PD14, SEC=WELMAND, SETNO=14,
 B10=40, B30=40;

CHA-PRODE:KIND=PD, PDNAME=PD14, SEC=WELMAND, SETNO=46,
 B10=42, B30=42;

CHA-PRODE:KIND=PD, PDNAME=PD14, SEC=WELNAME, CS=00, NO=13,
 B00=06;

CHA-PRODE:KIND=PD, PDNAME=PD14, SEC=RESTP, PDBLK=WELHEX,
 NO=12,  B00=0D;

CHA-PRODE:PD, PD14, ORG, , Y;
```

5.6.9.7 COT Parameter for full integrated PBXXX

```
ADD-COT:COTNO=110,
 PAR=RCL&XFER&ANS&KNOR&CEBC&TIE&CBBN&CBFN&FNAN&BLOC
&LWNC&ATRS&ITRC&ROPT&NLCR&CECO&TSCS&DFNN&CFOS&CFBU&CFVA&NLRD&PINR
&CFRM&ASTN&NTON;
```

5.6.9.8 Changes of standard LWPAR

For A-side

```
CHANGE-LWPAR:TYPE=CDG, BLNO=1, CDGTYPE=CONF, PROT=DPNSS,
BCHCONF=1&&15, EQVIRC=1&&30;
```

For B-side

```
CHANGE-LWPAR:TYPE=CDG, BLNO=2, CDGTYPE=CONF, UNWD=DPBCN,
PROT=DPNSS, EQVIRC=1&&30, VCHCONF=1&&15;
```

5.6.9.9 Remote registration of diversion

The 'Default DPNSS Password is configured in the PBXXX using AMO LWPAR. The default value for this parameter is = 9999 , which is the value usually configured in Realitis DX systems. To change the value of this parameter use the following (for example to set the default = 1234) :

```
CHA-LWPAR:TYPE=CDG, BLNO=<number>, CDGTYPE=CONF,
DEFPASSW=1234
```

5.6.9.10 Class of Service Configuration

The Class of Service interworking implemented by the Enhanced CDG feature converts between the following values in OpenScape 4000 and Realitis DX;

OpenScape 4000	DPNSS	Note
LCOS	RRC	In OpenScape 4000 LCOS is 2 parameters LCOSV for Voice calls LCOSD for Data calls This is known as TAC in Realitis DX
ITR	CBG	where the originator or terminator is an extension terminal (ITR group is also know as VBZGR in OpenScape 4000)
ITR	Trunk Group	where the originator or terminator is a trunk

The values used by the OpenScape 4000 and Realitis DX for these parameters do not have the same range, and to facilitate integration of OpenScape 4000 and Realitis DX switches in mixed networks the Enhanced CDG feature provides mapping tables for these parameters to convert between the OpenScape 4000 and DPNSS1 values.

Class of Service Parameters:

LCOSMAP: this parameter is used to enable or disable the mapping of all the parameters in the table following. The default value is 'enabled' and is configured using AMO LWPAR:

To enable Class of Service Mapping
`CHA-LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=CONF,LCOSMAP=Y`

To disable Class of Service Mapping
`CHA-LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=CONF,LCOSMAP=N`

LCOSVRRG and **LCOSDRRG** Tables: These tables convert between the LCOSV and LCOSD in OpenScape 4000 and the RRC (TAC) value in DPNSS1. There are separate tables for LCOSV and LCOSD and the table format for each is shown in Table 4. Each table is Indexed using the OpenScape 4000 LCOS value. The table is setup with default values with the DPNSS1 RRC having the same value as the OpenScape 4000 LCOS - this is shown in :Table 4 (note that the OpenScape 4000 LCOS value sent out on CorNet-NQ has the value 1 less than the value entered in the AMO).

Table 4: LCOS to RRC mapping table

OpenScape 4000 LCOS	DPNSS1 RRC
1	0
2	1

OpenScape 4000 LCOS	DPNSS1 RRC
3	2
4	3
5	4
6	5
. . .	. . .
30	29
31	30
32	31

The table can be configured using AMO LWPAR:

To change a single value in the LCOSVRRG table:

```
CHA-
LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=MAPPING,TBL=LCOSVRRG,LCOS=1
,RRG=32;
```

To change many values in the LCOSVRRG table:

```
CHA-
LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=MAPPING,TBL=LCOSVRRG,LCOS=1
&2&3&4,RRG=32&33&34&35;
```

To change a single value in the LCOSDRRG table:

```
CHA-
LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=MAPPING,TBL=LCOSDRRG,LCOS=1
,RRG=32;
```

To change many values in the LCOSDRRG table:

```
CHA-
LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=MAPPING,TBL=LCOSDRRG,LCOS=1
&2&3&4,RRG=32&33&34&35;
```

To set the LCOSVRRG table back to its default settings:

```
CHA-
LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=MAPPING,TBL=LCOSVRRG;
```

To set the **LCOSDRRG** table back to its default settings:

```
CHA-
LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=MAPPING,TBL=LCOSDRRG;
```

TRGCBG Table: This table converts between the OpenScape 4000 ITR (VBZ) value and the Realitis DX CBG (Call Barring Group) value when the originator or destination of a call is a terminal on the PBX. The format of the table is shown in Table 5. The table is Indexed using the OpenScape 4000 ITR value. The table is setup with default values with the DPNSS1 CBG having the same value as the OpenScape 4000 ITR - this is shown in Table 5.

Table 5: ITR to CBG Mapping Table

OpenScape 4000 ITR	DPNSS CBG
0	0
1	1
2	2
3	3
4	4
. . .	. . .
13	13
14	14
15	15

The table can be configured using AMO LWPAR:

To change a single value in the TRGCBG table:

```
CHA-
LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=MAPPING,TBL=TRGCBG,TRG=1,CB
G=32;
```

To change many values in the TRGCBG table:

```
CHA-
LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=MAPPING,TBL=TRGCBG,TRG=1&2&
3&4,CBG=32&33&34&35;
```

To set the TRGCBG table back to its default settings:

```
CHA-
LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=MAPPING,TBL=TRGCBG;
```

DXTGITR Table: This table converts between the OpenScape 4000 ITR (VBZ) value and the Realitis DX Trunk Group Number (in the Call Barring Group of the DPNSS1 COS) value when the originator or destination of a call is a trunk circuit. This is used for Trunk-to-trunk barring within a mixed OpenScape 4000, Realitis DX network.

The format of the table is shown in below. The table has 32 entries. The table is initially empty.

Entries are added to the table to map Trunk Groups values in Realitis DX into Trunk Group values in OpenScape 4000 and vice versa.

The range of the OpenScape 4000 ITR value (0 to 15) is much smaller than the Realitis DX Trunk Group values (0 to 200). This can result in many Realitis DX Trunk Group values mapping onto a single OpenScape 4000 ITR value. This situation is shown in the following table. For the direction Realitis to OpenScape 4000 the PBXXX converts the values as configured in the table, searching using the DXTG value. For the direction OpenScape 4000 to Realitis DX the one of the DXTG values must be chosen from the list (e.g. in the table shown,

OpenScape 4000 ITR value =0, this could be mapped to DXTG values of 12 or 254 or 127 or 199. The parameter PRIME is then used by PBXXX to choose which mapping to use; in the example the OpenScape 4000 ITR value = 0 will be mapped into Realitis DX Trunk Group value 127.

The parameter PRIME must be configured for one of the mappings where there are many DX Trunk Group values for the same OpenScape 4000 ITR value.

DXTGP	DPNSS DXTG	OpenScap 4000 ITR	PRIME	DXTGPC	DPNSS DXTG	OpenSca 4000 ITR	PRIME
0	34	5	*	1	12	0	
2	45	5		3	254	0	
4				5			
6	150	10		7	199	0	
8	127	0	*	9	27	9	*
10				11	18	5	
12				13			
14	23	15		15			
16				17			
18				19	2	9	
20				21	231	9	
22				23			
24				25			
26				27			
28				29			
30				31			

To set a single entry in the DXTGITR table:

```
CHA-
LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=MAPPING,TBL=DXTGITR,DXTGPOS
=14,DXTG=23,ITR=15;
```

To set many DXTG values to a single ITR value in the DXTGITR table :

```
CHA-
LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=MAPPING,TBL=DXTGITR,DXTGPOS
=0&2&11,DXTG=34&45&18,ITR=5,PRIMDXTG=34;
```

To set a PRIMDXTG value in the DXTGITR table:

```
CHA-
LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=MAPPING,TBL=DXTGITR,PRIMDXT
G=27;
```

To delete the whole DXGITR table:
```
CHA-
LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=MAPPING,TBL=DXTGITR;
```

5.6.9.11 Trunk Identity Configuration

The Trunk Identity service is enabled or disabled by configuration parameter. This parameter is TIDOP in AMO LWPAR. This parameter must be configured = YES to enable the mapping of Trunk Identity between OpenScape 4000 and DPNSS.

To turn trunk identity mapping on:
```
CHA-LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=CONF,TIDOP=Y;
```

To turn trunk identity mapping off:
```
CHA-LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=CONF,TIDOP=N;
```

5.6.9.12 Routing DX calls to AC-Win MQ source keys

This feature allows the CLC of ISRM messages from the DX to generate a particular priority in the classmarks of the Setup message sent to the OpenScape 4000. There are four categories of calls for which priorities are assigned, the brackets show the parameter used to change the value.

- Internal (ICPN)
- Analogue trunk (ATPCN)
- DASS (DASSPCN)
- Analogue PSTN (APCPN)

There are default values for these parameters which are:

- Internal = 11
- Analogue trunk = 12
- DASS = 13
- Analogue PSTN = 14

The priority has a range of 1 to 16.

To change the value of a parameter use the following (for example to set the call priority of internal calls to 6) :
```
CHA-LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=CONF2,ICPN=6;
```

Calls to the operator can be routed according to their priority to a particular ACWIN queue by use of the AMO parameter VFGR.

5.6.9.13 Automatic redirection to voicemail on busy

This feature allows a OpenScape 4000 user when calling a busy DX voicemail user to be redirected to a voicemail system. The OpenScape 4000 user on encountering a busy DX voicemail user will hear ring tone for a configurable time before being redirected to a voicemail system.

There are three configurable parameters set by LWPAR.

- AROB - this enables/disables the feature
- VMSYSTAD - this sets the voicemail address

- TAROB - this sets the delay before the user is redirected

An example for each is given below.

AROB

This can have a value of y or n. The default is n.
```
CHA-LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=CONF2,AROB=Y;
```

VMSYSTAD

This can store up to 22 digits in the range 0 to 9. The default is empty, no digits stored.
```
CHA-
LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=CONF2,VMSYSTAD=7802020;
```

TAROB

This parameter sets the delay in seconds before the call is redirected to the voicemail system.

To set 15 seconds,
```
CHA-LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=TIMER,TAROB=15;
```

5.6.9.14 Trunking: Private ISDN networking

One parameter SCCONF is used to enable/disable the ability of any station to control a conference. The parameter can have a value of y or n, the default n.

Setting SCCONF to n means master controlled conference is used.

To turn station controlled conference on:
```
CHA-LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=CONF2,SCCONF=Y;
```

To turn station controlled conference off:
```
CHA-LWPAR:TYPE=CDG,BLNO=<number>,CDGTYPE=CONF2,SCCONF=N;
```

5.6.10 Relevante AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
LWPAR	TYP=CDG	d	Typ für PBXXX (nur Ã„NDERN, LOESCHEN, ABFRAGEN, REGENERIEREN, KOPIEREN)
	TYPE=CDG	e	Type for PBXXX (only CHANDE, DELETE, DISPLAY, REGENERATE, COPY)
	CDGTYP	d	Verzweigung: = KONF: Konfigurationdaten ändern = TIMER: Zähler und Reserveparameter ändern

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
	CDGTYPE	e	Branch: = CONF: Change configuration data = TIMER: Change timer
	BLNR	d	Blocknummer, wurde für PBXXX auf 0-49 erweitert
	BLNO	e	block number has been extended to 0-49 for PBXXX
	BLNRALT	d	alte Blocknummer, wurde für PBXXX auf 0-49 erweitert (Aktion KOPIEREN)
	BLNOOLD	e	old block number has been extended to 0-49 for PBXXX (action COPY)
	BLNRNEU	d	neue Blocknummer, wurde für PBXXX auf 0-49 erweitert (Aktion KOPIEREN)
	BLNONEW	e	new block number has been extended to 0-49 for PBXXX (Aktion KOPIEREN)
	LWPARREF	d	LWPAR Referenz-Information ausgeben (Verweis, welchen Sätzen der Block zugeordnet ist, JA/NEIN)
		e	display LWPAR reference information (circuits which have assigned the block number, Y/N)
	MUSTER	d	Ruhebitmuster für die B-Kanäle der Strecke (0-255)
	PATTERN	e	idle bit pattern for the b-channels on the route (0-255)
	BENW	d	Benutzer/Netzwerk Einstellung: = DPACB: DPNSS:A / Cornet:Benutzer = DPACN: DPNSS:A / Cornet:Netzwerk = DPBCB: DPNSS:B / Cornet:Benutzer = DPBCN: DPNSS:B / Cornet:Netzwerk
	UNWD	e	user/network definition: = DPACU: DPNSS:A / Cornet:user = DPACN: DPNSS:A / Cornet:network = DPBCU: DPNSS:B / Cornet:user = DPBCN: DPNSS:B / Cornet:network
	PROT	d	externes Protokoll - nur fuer CORNET-N Protokoll relevant: = DASS = DPNSS

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
		e	external protocol - relevant for CORNET-N protocol only: = DASS = DPNSS
	BKAKONF	d	DPNSS B-Kanal x/y Konfiguration (1-30, gekettet)
	BCHCONF	e	DPNSS b chanel x/y configuration (1-30, concat.)
	VKDPNSS	d	virtuelle Kanäle mit DPNSS (1-30, gekettet)
	EQVIRC	e	DPNSS equipped virtual channels (1-30, concat.)
	VKKONF	d	virtuelle Kanäle x/y Konfiguration (1-30, gekettet)
	VCHCONF	e	virtual chanels x/y configuration (1-30, concat.)
	NSIMLDL	d	Meldungslänge für NSI / nicht NSI-Umschaltung (100-2048)
	NSIMSGS	e	message size NSI to non NSI switchover (100-2048)
	SADRUM	d	DASS-Cornet Subadresse Übersetzungsmethode: = NSAP: Network Service Access Point = USER: vom Benutzer definiert
	SADRTM	e	DASS-Cornet subaddress translation method: = NSAP: Network Service Access Point = USER: user specified
	MAXTNL	d	DPNSS maximale Übertragungslänge einer Meldung (0-2048)
	MAXTMS	e	DPNSS maximum transit message size (0-2048)
	RESTLNK	d	Restart Link bei Cornet-Hochlauf (JA/ NEIN)
		e	restart link at startup (Y/N)
	RESTALL	d	Restart alle LAPs bei DPNSS/DASS-Hochlauf (JA/NEIN)
		e	restart all LAPs at DPNSS/DASS-startup (Y/N)
	BCHNEG	d	B-Kanalverhandlung (JA/NEIN)

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
		e	b channel negotiation (Y/N)
	CRC4C	d	CRC4 bei Cornet-N/NQ (JA/NEIN)
		e	CRC4 for Cornet-N/NQ (Y/N)
	CRC4REP	d	Schicht 2 CRC4 bei DPNSS/DASS (JA/NEIN)
		e	layer-2 CRC4 reporting for DPNSS/ DASS (Y/N)
	TEMPSIG	d	temporaere Signalisierungsverbindung (JA/NEIN)
		e	temporary signaling connection (Y/N)
	NSITR	d	NSI Cornet-NQ transit (JA/NEIN)
		e	NSI Cornet-NQ transit (Y/N)
	NSIOUT	d	Einfügen von NSI in DPNSS abgehend (JA/NEIN)
		e	insert NSI DPNSS outgoing (Y/N)
	CDGCF	d	PBXXX transit bei Rufweiterschaltung (JA/NEIN)
		e	PBXXX transit working on call forward (Y/N)
	CONVBN	d	Notify-Rückumwandlung von Cornet-N (JA/NEIN)
		e	conversion back-notify from Cornet-N (Y/N)
	TIDOP	d	DPNSS Trunk Identifizierungsoption (JA/NEIN)
		e	DPNSS trunk identity (TID) option (Y/ N)
	C3CONF	d	Halten möglich von Konferenz-Master bei Dreierkonferenz (JA/NEIN)
		e	3-party conference hold allowed from conference master (Y/N)
	CONACK	d	Verbindungsquittung von Protokol Handler (JA/NEIN)
		e	connect acknowledge sent by protocol handler (Y/N)

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
	LSCF	d	Loadware im Flash komprimiert gespeichert (JA/NEIN)
		e	loadware saved compressed in flash (Y/N)
	DEFID	d	ROP, die benutzte Anruf-Identifikationslänge in Cornet-NQ: = B001: 1 Ziffer = B010: 2 Ziffern = B011: 3 Ziffern = B100: 4 Ziffern
		e	ROP, default call identity lenght used in Cornet-NQ: = B001: 1 digit = B010: 2 digits = B011: 3 digits = B100: 4 digits
	DASSOPN	d	DASS Operator Rufnummer (max. 22-stellig)
		e	DASS operator number (max. 22-digits)
	TBID	d	Timer: Callback Interdigit (1-20 Sek.)
		e	timer callback interdigit (1-20 sec)
	TROPTBR	d	Timer: ROPT Release - beide Enden freigegeben (1-100 Sek)
		e	timer ROPT release - both end released (1-100 sec)
	TROPTNR	d	Timer: ROPT Release - kein Ende freigegeben (1-100 Sek)
		e	timer ROPT release - neither end released (1-100 sec)
	TDPNSSC	d	Timer: DPNSS Kollision (0-50*100 ms)
		e	timer DPNSS collision (0-50*100 ms)
	TWEOS	d	Timer: Warten auf EOS von Cornet (0-100 Sek)
		e	timer wait for EOS from Cornet (0-100 sec)
	TSABMR	d	Timer DPNSS SABMR Neuübertragung (0-255 Sek)
		e	timer DPNSS SABMR retransmission (1-255 sec)

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
	T301...T305	d	Timer 301 ... Timer 305 (0-255 Sek)
		e	timer 301 ... timer 305 (0-255 sec)
	T308...T310	d	Timer 308 ... Timer 310 (0-255 Sek)
		e	timer 308 ... timer 310 (0-255 sec)
	T313-T314	d	Timer 313 , Timer 314 (0-255 Sek)
		e	timer 313 , timer 314 (0-255 sec)
	T316, T322	d	Timer 316 , Timer 322 (0-255 Sek)
		e	timer 316 , timer 322 (0-255 sec)
	TAMOST	d	Timer: AMO Überwachung (0-255 Sek)
		e	timer AMO supervision timeout (0-255 sec)
	RES1...RES5	d	Reserve 1 ... Reserve 5 (0-65535)
		e	reserve 1 ... reserve 5 (0-65535)
TDCSU	GER=CDGAMT	d	Gerät: PBXXX für Amtsanschluss
	DEV=CDGCOD	e	Device for PBXXX trunk to CO
	GER=CDGVERB	d	Gerät: PBXXX für Querverbindungen
	DEV=CDGCONN	e	Device for PBXXX tie trunk
	LWPAR	d	Verweis auf den Loadware Parameter Block, für PBXXX ist die Blocknummer 0-49 erlaubt
		e	Reference to Loadware Parameter Block, for PBXXX block number 0-49 is allowed
	TRACOUNT	d	Transit Counter: für PBXXX ist nur 1-25 (Standard 25) erlaubt
		e	Transit Counter: for PBXXX only 1-25 (Default 25) is allowed
	PROTVAR	d	Protokollvariante: für PBXXX sind nur Cornet-N und Cornet-NQ (CORNV33, ECMAV2) erlaubt. Bei Cornet-NQ wird immer das externe Protokoll DPNSS1 in der PBXXX eingestellt

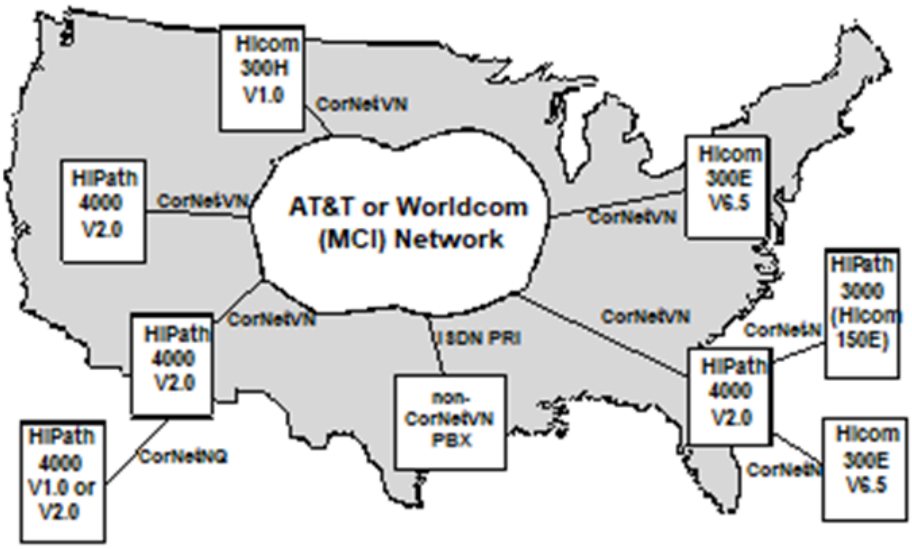
AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
		e	Protocol Variant: for PBXXX: only Cornet-N and Cornet-NQ (CORNV33, ECMAV2) are allowed. Cornet-NQ impacts the PBXXX external protocol DPNSS1

5.7 CorNet-VN (CorNet Virtual Networking)

5.7.1 Feature Description

CorNet Virtual Networking (CorNet-VN) is a patented signaling protocol whereby the networking capabilities of CorNet-N are supported over a public switched telephone network (PSTN) connection. This is done by passing the proprietary signaling elements of CorNet-N through the PSTN using the user-to-user signaling (UUS) capabilities of the public network carrier.

CorNet-VN is offered to U.S. customers as an alternative to conventional CorNet-N or CorNet-NQ trunks that require dedicated T1 facilities. CorNet-VN is not intended to replace CorNet-N or CorNet-NQ trunks, but rather augment them with a solution that is more cost effective in certain customer environments. The typical situation where CorNet-VN is more cost effective than CorNet-N/NQ trunks is for inter-connecting distant locations that have low traffic volume where dedicated or leased-line facilities would be expensive and under utilized. CorNet-VN shall be supported across AT&T and Worldcom (formerly MCI) public telephone networks.



The above figure illustrates a typical CorNet-VN network whereby CorNet-VN is used for long-haul non-IP connectivity through the PSTN. CorNet-N is used for lang-haul non-IP connectivity between OpenScape 4000/HiPath

4000 switches. CorNet-NQ is used for short-haul non-IP connectivity between OpenScape 4000/HiPath 4000 switches. The figure shows a mix of switch types that are CorNet-VN capable as well as a non-CorNet-VN-capable switch that is connected to the PSTN using conventional ISDN-PRI.

5.7.2 User Interface

CorNet-VN is based on CorNet-N, therefore the user has a limited CorNet-N user interface available.

5.7.3 Service Information

The CorNet-VN feature is intended for North American marktplace.

5.7.4 Generation (Example)

CorNet-VN will run on the TMDNH (Q2192-X, Function ID 3) card or on its replacement DIUN2U (Q2216-X, Function ID 6).

- How to configures the TMDNH / DIU2U board

  configures the TMDNH board:

```
ADD-BCSU: MTYPE=TMD, LTG=x, LTU=y, SLOT=z,
 PARTNO="Q2192-X",
FCTID=3, LWVAR="K", HWYBDL=A;
```

  configures the DIU2U board:

```
ADD-BCSU: MTYPE=TMD, LTG=x, LTU=y, SLOT=z,
 PARTNO="Q2216-X",
FCTID=6, LWVAR="K", HWYBDL=A;
```

- How to configures the CorNet-VN AT&T

  The following commands are based on COPY-PRODE: TYPE=PVCD, PVCDNO=16 to load the US protocols into memory (default PVCDNO = 16). Then the associated PRODE tables for CVN1 and CVN2 are available.

  configures the AT&T trunk:

```
CHANGE-LWPAR: TYPE=TMD, TMDTYPE=TMDMOS, BLNO=3,
OPMODE=FRAMEESF&BISUB8ON&BDETON, CABLETYP=1,
 OESDISTH=30,
OESREQTH=4, SESDISTH=10, SESREQTH=10, ACKTIM=10,
 DLVTIM=300,
OCTMAX=260, RETMAX=3, WINDOW=7, CRIDC=0288, NSFIV=1,
NSFTSC=9, TTSC=4;
```

  configures new device S1CVN with AT&T protocol:

```
ADD-TDCSU: OPT=NEW, PEN=x-y-z-1, COTNO=99, COPNO=95,
 DPLN=1,
ITR=0, LCOSV=1, LCOSD=1, CCT=" ", DESTNO=5,
 PROTVAR="CVN1",
SEGMENT=1, DEDSVC=NONE ,TRTBL=GDTR, SIDANI=N,
 ATNTYP=TIE,
CBMATTR=NONE, TCHARG=N, SUPPRESS=0, TRACOUNT=31,
```

```
SATCOUNT=MANY, NNO=1-1-501, ALARMNO=2, FIDX=1,
 CARRIER=1,
ZONE=EMPTY, COTX=99, FWDX=1, CHIMAP=N, UUSCCX=16,
 UUSCCY=8,
FNIDX=1, NWMUXTIM=10, CLASSMRK=EC&G711&G729OPT,
 TGRP=98,
SRCHMODE=DSC, INS=Y, DEV=S1CVN, BCHAN=1&&23, BCNEG=N,
 BCGR=1,
LWPAR=3;
```

- How to configures the CorNet-VN MCI trunk

  The following commands are based on COPY-PRODE: TYPE=PVCD, PVCDNO=16 to load the US protocols into memory (default PVCDNO = 16). Then the associated PRODE tables for CVN1 and CVN2 are available.

  configures the MCI trunk:

```
CHANGE-LWPAR: TYP=TMD, TMDTYP=TMDMOS, BLNO=4,
OPMODE=FRAMEESF&BISUB8ON&BDETON, CABLETYP=1,
 OESDISTH=30,
OESREQTH=4, SESDISTH=10, SESREQTH=10, ACKTIM=10,
 DLVTIM=300,
OCTMAX=260, RETMAX=3, WINDOW=7, CRIDC=0222, NSFIV=1,
NSFTSC=9, TTSC=4
```

  configures new device S1CVN with MCI protocol:

```
ADD-TDCSU: OPT=NEW, PEN=x-y-z-1, COTNO=99, COPNO=95,
 DPLN=1,
ITR=0, LCOSV=1, LCOSD=1, CCT=" ", DESTNO=5,
 PROTVAR="CVN2",
SEGMENT=1, DEDSVC=NONE ,TRTBL=GDTR, SIDANI=N,
 ATNTYP=TIE,
CBMATTR=NONE, TCHARG=N, SUPPRESS=0, TRACOUNT=31,
SATCOUNT=MANY, NNO=1-1-501, ALARMNO=2, FIDX=1,
 CARRIER=1,
ZONE=EMPTY, COTX=99, FWDX=1, CHIMAP=N, UUSCCX=16,
 UUSCCY=8,
FNIDX=1, NWMUXTIM=10, CLASSMRK=EC&G711&G729OPT,
 TGRP=98,
SRCHMODE=DSC, INS=Y, DEV=S1CVN, BCHAN=1&&23, BCNEG=N,
 BCGR=1,
LWPAR=4;
```

- Activation / Deactivation of CorNet-VN

  displays the number of contracted, assigned and free CVN trunks:

```
DISP-CODEW;
```

5.7.5 Relevant AMOs

AMO	Parameter	Sprache	Beschreibung
BCSU	PARTNO	d	= "Q2216-X" für DIU2U Board = "Q2192-X" für TMDNH Board
	PARTNO	e	= "Q2216-X" for DIU2U Board = "Q2192-X" for TMDNH Board

AMO	Parameter	Sprache	Beschreibung
	FCTID	d	= 6 für DIU2U Board = 3 für TMDNH Board
	FCTID	e	= 6 for DIU2U Board = 3 for TMDNH Board
LWPAR	CRIDC	d	Pflichtfeld für CVN = 0288 for AT&T = 0222 for MCI
	CRIDC	e	Mandatory when block is used for CVN = 0288 for AT&T = 0222 for MCI
	NSFIV	d	Default = 1, = 1 für AT&T und MCI
	NSFIV	e	Default = 1, = 1 for AT&T and MCI
	NSFTSC	d	Default = 9, = 9 für AT&T und MCI
	NSFTSC	e	Default = 9, = 9 for AT&T and MCI
	TTSC	d	Default = 4, = 4 für AT&T und MCI
	TTSC	e	Default = 4, = 4 for AT&T and MCI
TDCSU	PROTVAR	d	= CVN1 für AT&T = CVN2 für MCI
TDCSU	PROTVAR	e	= CVN1 for AT&T = CVN2 for MCI
TDCSU	DEV	d	= S1CVN für die Konfiguration von CorNet-VN trunks
TDCSU	DEV	e	= S1CVN for configuring CorNet-VN trunks

5.8 Country-Specific Connection Techniques With Analog Trunks

The following sections offer some tips and tricks that you can use with the DH-Länder (DS120). A different chapter describes the MFC-R2 signaling. As a general rule, features that have been implemented for a particular country have been developed in a way that allows the feature to be used for other countries as well. Of course this idea cannot always be applied to all features (because the hardware, loadware, and other components must match the system software (generally DH/CP)).

5.8.1 Trunk Connections Versus Tie Connections

Regardless of the devices (circuits) and their signaling, you can also use a "trunk connection" as a tie trunk with the COP and COT parameter "TIE". This is true for terminating connections (incoming). For generated connections

(outgoing), the combination of digital analysis result (WABE) and route (LCR) is important.

5.8.2 Dial Tone, Proceed-to-Send Signal on Outgoing Seizure

There are users who wait for a proceed-to-send signal (usually a dial tone) after the trunk group code. We recommend giving up this type of dialing and continuing to dial immediately.

Using different parameters and settings, you can have the system request that the user continue dialing.

- After the user dials the trunk access code, the system applies a tone even if it has not found a circuit:
  `AMO ZAND: TYPE=ALLDATA, CODTN=YES;`
- Using LDPLN, you can configure the digit pattern so that the dial tone is applied at any position in the dialing. Here it is also the case that the system has not yet searched for (let alone seized) the circuit. You can also administer several dial tones here. Example for applying the dial tone after the user has dialed the code 528:
  `ADD-LDPLN:LDP=528-W-X,LROUTE=228,LAUTH=1;`

5.8.2.1 Real Dial Tone (Time-Dependent) From the Central Office (CO)

If the remote central office also actually applies a dial tone, you must set the following parameters for the outgoing seized trunk to apply the real dial tone to the outgoing user from the central office.

- COP parameter: TDED (line with time-dependent central office dial tone)
- AMO TACSU:DIALVAR=x-8 (where x usually has the value 0)
- AMO ZAND: TYPE=ALLDATA, CODTN=NO
- You must configure the outgoing seized circuit for the proceed-to-send signal (COP parameter: SDL).

  The sound path of the outgoing user is switched to the circuit when the dial tone from the remote central office has been detected.

  If only the parameter TDED is set but not the corresponding type of dialing, the OpenScape 4000 generates the CO dial tone itself and then applies it when this tone is detected on the line (time-dependent).

5.8.3 Dialing Procedures

The DH-Länder handles several dialing procedures. You control these with COP and the DIALTYPE element in the AMO TACSU. To allow for different procedures in incoming and outgoing seizures, use DIALTYPE = iii-ooo (1st value for incoming, 2nd value for outgoing).

The usual dialing procedures are: MOSIG-DTMF, DTMF-DTMF, DIP-DIP, MFC-MFC. The other procedures DIPA, MFP1, MFP2, MFRP, and MFRS are used in the CIS countries.

MOSIG-DTMF: Main station interfaces (incoming call, outgoing loop, and DTMF dialing).

DTMF-DTMF, DIP-DIP: double configured DID (direct inward dialing) line with DTMF (dual tone multi-frequency signaling) or DIP (dial pulse signaling) in both directions.

MFC-MFC: double configured DID line with MFC signaling.

If you use outgoing DTMF dialing, you also need the COP DTMF and DTM1 (or DTM2, etc.) to control the DTMF SIU (signaling unit). In the same way, you need the COP BR64 and IDP1 (or IDP2, etc.) when you use DIP dialing to control the pulse and the time between pulse series.

5.8.4 End-of-Dial and Answer on Outgoing Seizure

On loop start lines (or similar signaling with DTMF or DIP dialing), the remote exchange does not always announce the end-of-dial on outgoing seized lines (generated connections). This means that this signal must be artificially generated so that the user can switch from the dial to the talking state. This is done using a timer. Two timers are provided in the system, end-of-dial and end-of-dial with 1A-procedure. (Also refer to Kapitel auf Seite 312). There is a separate description of the control of the end-of-dial and answer with and without charges (Section 28.4.4, "End-of-Dial With First Call Charge Pulse").

IMPORTANT: Call detail recording (CDR) registers the digits dialed during the 'dial state' but ignores digits dialed later.

5.8.4.1 End-of-Dial Code With '#'

Different countries (such as the UK) use the pound sign (#, hash mark, number sign) as the end-of-dial code. The system interrupts the dialing to the CO as soon as the character to be sent would have been a '#' and switches the connection to the talking state.

This feature is only used when the COP parameter SFRM is set. If the first digit that was sent to the CO was an asterisk (*) or pound sign (#), the system assumes that the so-called 'Value Added Network Services' are being used. The system then sends out # and generates end-of-dial via the timer (see above).

If the parameter SFRM is not set, all characters of a 16-entry keypad are sent to the remote exchange (also applies to DIP).

This procedure also applies to a DTMF AnaTe. The 1A procedure described later can be interrupted by dialing the pound sign.

You can use the same method when dialing with LCR. In MFC-R2, the "dial complete" signal is converted to I-15.

5.8.4.2 End-of-Dial According to the 1A Procedure

The 1A dialing procedure is a method of suppressing the DTMF signals sent by a DTMF user to a remote exchange that can evaluate any DTMF signals. This is because otherwise incorrect dialing could result. The SIU sends DTMF signals to the remote exchange.

IMPORTANT: The 1A procedure is always used when the internal station is a DTMF device. If the trunk is seized over a CorNet link (circuit and station on different systems), digital telephones also display this property (default value).

You can switch the end-of-dial procedure 1A with the COP parameter NO1A:

- When the parameter is set, the digits are sent to the CO with no delay (also applies to DIP dialing to CO) and the speech path is not switched until after the 1A time expires; the connection switches to the talking state.
- If the parameter is not set, the last digit is sent to the CO but delayed by the 1A time (also applies to DIP dialing to the CO) and then the connection switches to the talking state.

5.8.4.3 End-of-Dial by Line Signal

Naturally the OpenScape 4000 (or the combined Länder-DH) also handles an END-OF-DIAL signal from the line. One of the timers mentioned above is always used in this case, however. The system ignores an END-OF-DIAL signal that is delayed and arrives after the timer has expired.

5.8.4.4 End-of-Dial With First Call Charge Pulse

The combined Länder-DH interprets the first call charge pulse as end-of-dial and answer. If this is not what you want, you must set the COP parameter NOAN.

This procedure also applies to a DTMF AnaTe, so the procedure 1A is therefore ended with the 1st call charge pulse and the paths (speech paths) are through-connected.

5.8.4.5 Effect of the End-of-Dial, Call Charge Pulse, and Answer Signals

The COP parameters ANS and NOAN have the following combined meanings:

ANS	NOAN	Remark
NO	NO	End-of-dial and answer are announced to the CP together after time-out. Transition to the talking state. 1st call charge pulse or the ANSWER signal during dialing is interpreted as end-of-dial and answer.
NO	YES	End-of-dial and answer are announced to the CP together after time-out. The 1st call charge pulse is not interpreted as the ANSWER signal. If the line sends an ANSWER signal in the dial state, this causes a change to the talking state.
YES	NO	End-of-dial announced after time-out. An ANSWER signal or a 1st call charge pulse must be received.

ANS	NOAN	Remark
YES	YES	The line must receive an ANSWER signal to change the connection to the talking state. After the end-of-dial timer expires, no more digits are sent.

IMPORTANT: The COP parameter EOD (line with end-of-dial) signals the end-of-dial on incoming seizures.

5.8.4.6 Configuring the End-of-Dial Monitoring and End-of-Dial 1A Timers

Because the end-of-dial detection influences the transition to the talking state but the dialing behavior of the user must also be taken into consideration, there are conflicting requirements. Furthermore, you should note that signaling method no. 5 used in international traffic uses a 5 second timer here. The LCR settings also have an influence (for example, no seizure until all digits have been dialed).

```
CHANGE-DTIM2:TYPEDH=LNGEN,EOD=5000,EOD1A=5000; (values in
 ms)
```

5.8.5 Dial Tone on Incoming Seizure

As was already mentioned, there are networks (or customers) who do not continue dialing until they hear a dial tone. The problem can now also occur on incoming seizures (terminating connections). A dial tone should be applied as soon as the line is ready for digit input. Different dial tones are possible. Administer them as follows:

COP parameter: DTN (dial tone on incoming seizure)

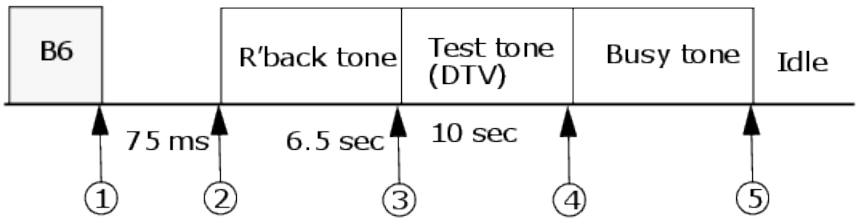
COT parameter: DTNI (internal dial tone) or DTNE (incoming dial tone, outgoing mark as co-conn) or ANNC (local announcement). You must set one of the parameters NTON (no tone), DTNI, DTNE, or ANNC. You can administer the actual tones using the AMO ZAND after the normal configuration.

5.8.6 Test Port

For DID calls, it is possible to dial a test port or a test program. These are implemented with software only. You control these test programs with a TESTNO specified with TACSU and by selecting the code TESTLN.

5.8.6.1 CH (Switzerland) Test Port

You can also control this test program with dial pulsing DID.



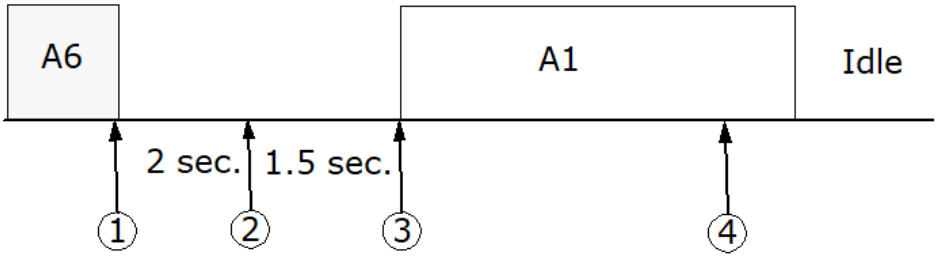
1) End of the last MFC-R2 signal, 75 ms timer in accordance with UIT Q.475, or end-of-dial detection.
2) END-OF-DIAL-FREE message to the line (loadware) and application of the ringback tone (including 1st ringback tone).
3) Time-out for controlling the ringback tone phase (including 1st RINGBACK TONE); 2 .. 3 times ringback tone. ANSWER message to line (loadware)
4) Time-out for controlling the test tone phase; RELEASE message to line (loadware)
5) Wait for release from CO (RESETPOTENTIAL message from the loadware); READY message to CP, line free for switching.

To control the SWZ test program you must assign the correct TESTNO in the TACSU and you must configure the timer in compliance with the defaults.

- Set or change the test number in the TACSU as follows:
  `CHANGE-TACSU: ..., TESTNO = 1`
- Set or change the timers as follows:
  `CHANGE-DTIM1:TYPEDH=MFCDID,TSUPV1=6500,TSUPV2=10000;`

5.8.6.2 BEL Test Port

You can only control this test program with MFC-R2 DID.

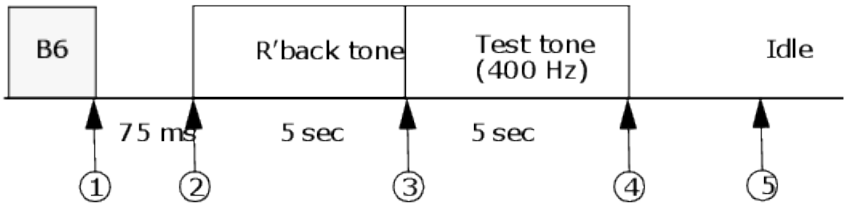


1) End of the last MFC-R2 signal; END-OF-DIAL-FREE message to line (loadware)
2) ANSWER message to line (loadware); application of the ringback tone (including 1st ringback tone)
3) Time-out for controlling the test tone phase. The MFC-R2 forward signal A1 is used as the test tone in Belgium.
4) Wait for RELEASE from CO. READY message to CP, line free for switching

To control the BEL test program you must assign the correct TESTNO in the TACSU and you must configure the timer in compliance with the defaults.

- Set or change the test number in the TACSU as follows:
  `CHANGE-TACSU: ..., TESTNO = 2`
- Set or change the timers as follows:
  `CHANGE-DTIM1:TYPEDH=MFCDID,TSUPV1=6500,TSUPV2=10000;`

5.8.6.3 RSA Test Port

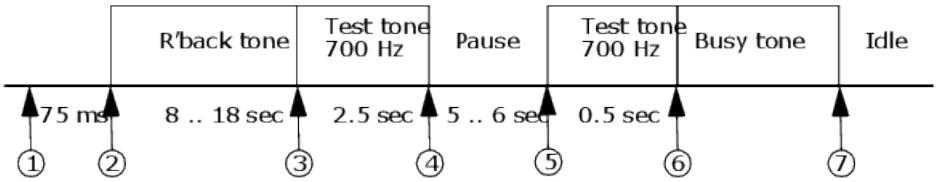


1) End of the last MFC-R2 signal, 75 ms timer in accordance with UIT Q.475 or end-of-dial detection
2) END-OF-DIAL-FREE message to line (loadware); Application of the ringback tone (including 1st ringback tone)
3) Time-out for controlling the ringback tone phase (including 1st ringback tone). 2 .. 3 times ringback tone; and ANSWER message to PP (loadware).
4) Time-out for controlling the test tone phase; RELEASE message to the line (loadware)
5) RESETPOTENTIAL message from PP (loadware); READY to CP, line free for switching

To control the RSA test program you must assign the correct TESTNO in the TACSU and you must configure the timer in compliance with the defaults.

- Set or change the test number in the TACSU as follows:
  `CHANGE-TACSU: ..., TESTNO = 4`
- Set or change the timers as follows:
  `CHANGE-DTIM1:TYPEDH=MFCDID,TSUPV1=5000,TSUPV2=5000;`

5.8.6.4 CIS Test Port



1) End-of-dial detection
2) END-OF-DIAL-FREE message to line (loadware)
3) ANSWER message to line (loadware)
4) Time-out for controlling the idle phase
5) Time-out for controlling the 2nd test tone phase
6) RELEASE message to line (loadware)

7) READY message to CP, line free for switching

To control the CIS test program you must assign the correct TESTNO in the TACSU and you must configure the timer in compliance with the defaults.

- Set or change the test number in the TACSU as follows:
  `CHANGE-TACSU: ..., TESTNO = 27`
- Set or change the timers as follows:
  `CHANGE-DTIM1:TYPEDH=MFCDID,TSUPV1=13000,TSUPV2=2500,TSUPV3=5500,TSUPV4=500;`

5.8.7 Extension of Trace Signaling for Calls to the Attendant Console

Different sequences and signaling in Finland and the Czech Republic: In Finland, the attendant console should automatically have trace authorization as soon as one user in a system has this authorization. In the Czech Republic the attendant console should also explicitly receive the trace authorization. The new COT parameter "AC with call tracing" has been introduced for this purpose.

- Set the COT parameter for calls to the attendant console as follows:
  `CHANGE-COT:COTNO=x,COTTYPE=COTADD,PAR=ACTR;`

IMPORTANT: In Finland you must set the COT ACTR as soon as a user is authorized for tracing.

5.8.8 Line With Loop Start Signaling and Straightforward Direct Inward Dialing (DID)

There are customers who have a PTT that cannot provide them with DID because of a lack of resources. The feature described here for main station interfaces (loop start signaling) can help (if the general numbering plan allows it).

Naturally you can also use the feature for connecting external systems with the OpenScape 4000 (see also TC-SL link).

5.8.8.1 Feature Description (User Interface)

The 'external' user calls the connection number. When there is a call on the line, the OpenScape 4000 generates an ANSWER to the CO and applies the dial tone. The external user can now dial into the system. The codes that are possible are the same as for 'normal' DID.

IMPORTANT: In this application, the assessment begins with the answer (application of the dial tone).

The feature described functions only with DTMF apparatuses because the DID is operated with the DTMF signaling method. This means that the external user must dial with a DTMF device or use an acoustic coupler.

5.8.8.2 Operational Configuration

The COP of the main station line must include the parameter DTN (dial tone on incoming seizure). Determine the dial tone in the AMO COT. It is also possible to have a synchronous announcement for the proceed to select signal.

You must set the DIALTYPE in the AMO TACSU to DTM-x and you must set the DIALVAR to 5-0 (line with old loop start loadware BWMSCH) or 4-0 (all other loop start signaling).

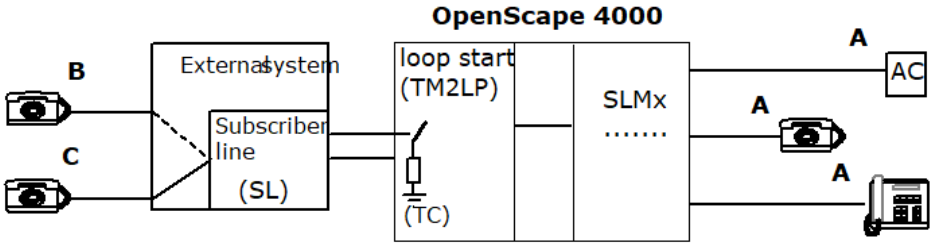
5.8.8.3 Important Note on the 'Trunks'

Trunks that are operated with the feature described here must be answered or they will not be able to be released later. This condition does not apply if the trunk (including the hardware used) can handle forward release by interrupting the supply voltage. You must coordinate this with the remote exchange during the system start-up.

If forward release is not possible, you must set all intercept cases (COT) while keeping in mind that calls to the attendant console or night station must be answered. (One way to do this is with the help of an answering machine that also triggers when the system is operated unattended).

5.8.9 Connection to External Systems Using TC-SL Link

Straightforward networking of the OpenScape 4000 with external products is possible with a TC-SL link. An analog subscriber line (SL) from the external system is connected to a trunk circuit (TC) from the OpenScape 4000 (loop start signaling).



The following chapters contain some specific notes on the following applications:

- Outgoing seizure
- Incoming seizure
- Consultation hold
- Trunk grounding/trunk flash
- Consultation hold pick up in straightforward trunk calls
- Suffix dialing

5.8.9.1 Outgoing Calls (OpenScape 4000 to External System)

Calls that a OpenScape 4000 user makes to a remote system take place with the digital analysis result CO (or tie) and the appropriate signaling method. To reach the talking state, the end-of-dial criteria described above apply.

5.8.9.2 Incoming Calls (External System to OpenScape 4000)

Calls from an external user to the OpenScape 4000 (BWMSCH) reach the attendant console or reach a specific user with the help of the Dedicated Incoming Trunk (continuous assigned night service) feature. The loop start trunk with straightforward DID feature (pseudo DDI; see above for more information) offers another way to selectively reach a OpenScape 4000 user.

5.8.9.3 Consultation Hold

A consultation hold in the external system is initiated or cancelled with flash or ground. Because the OpenScape 4000 does not know whether an incoming call is a consultation hold call, the call can be picked up with either the feature Trunk grounding/trunk flash or the feature Picking up a consultation hold in straightforward trunk calls.

5.8.9.3.1 User Interface

If you want to set up a consultation hold in the external system, proceed as follows:

- Initiate the consultation hold in the talking state (incoming or outgoing) in the OpenScape 4000 and dial the OPROVR code.
- Wait for the dial tone of the external system (is not evaluated by the OpenScape 4000)
- Dial the user number in the external system (suffix dialing after grounding).
- Depending on the properties of the external system, either you can transfer the call by going on hook or you must wait until user C picks up.
- Cancel the consultation hold in the external system: initiate the consultation hold (in the OpenScape 4000) and dial the code OPROVR (connection A-B).

5.8.9.4 Trunk Grounding/Trunk Flash

The feature described in the following was developed under the name "operator recall". It should take the place of repeatedly pressing the cradle button, which is common in different countries and is used to call the operator. There are (dedicated) circuits that use an adaptor to convert the ground pulse into a call to get the remote party on the line.

5.8.9.4.1 Implementation

Depending on the COP parameter DTMP for the line, the system generates a ground pulse (DTMF not set) or a loop interruption (DTMF set). It is not possible to replicate an AnaTe with DTMF dialing and ground key.

When the ground pulse or the flash pulse ends, the trunk returns to the talking state.

You can set the ground pulse or flash for BWMSCH lines with the AMP PTIME, parameter TBLK for BWMSCH under L3 and L4. L3 contains the time for the ground pulse (default: 240 ms) and L4 the time for the flash (default: 120 ms).

IMPORTANT: NOTE for BWMSCH lines The ground is applied only to the ring wire in the ground pulse. You must check the wiring because the tip and ring wires are no longer polarity-independent.

5.8.9.4.2 User Interface

- DigiTe:

  Initiate a consultation hold from the talking state (in the OpenScape 4000) and dial the OPROVR code: -> ground pulse/flash to trunk.

  You can simplify the procedure by programming the 'OPROVR' code on a name/destination key. Then you do not have to initiate the consultation hold.

  Send the (suffix) dialing to the remote exchange with the signaling method (-outgoing: DIP or DTMF) that is assigned to the line.
- AnaTe:

  Initiate the consultation hold from the call and dial the OPROVR code: -> ground pulse/flash to trunk.

  Send the (suffix) dialing from a COMTEL 3 (DIP-AnaTe) to the remote exchange with the signaling method (-outgoing: DIP or DTMF) that is assigned to the line.
- AC:

  Push the aggregate key during the call -> ground pulse / trunk flash; (WABE: OPROVR for AC is not necessary). Then it is not possible to dial on the line.

5.8.9.5 Picking Up a Consultation Hold in Straightforward Trunk Calls

Even the first OpenScape 4000 versions had the feature Picking up a consultation hold in straightforward trunk calls. This makes it possible to pick up a consultation hold connection that was set up by the external exchange (see figure).

5.8.9.5.1 Implementation

This uses the same procedures as for Initiating a consultation hold or Ground/flash to CO (see previous sections).

5.8.9.5.2 User Interface

- DigiTe:

  Initiate a consultation hold from a call and dial PUEXT code: -> ground pulse/flash to trunk; cancel consultation hold.

  You can simplify the procedure by programming the 'PUEXT' code on a name/destination key. Then you do not have to initiate and cancel the consultation hold.
- AnaTe:

  Initiate a consultation hold from a call and dial PUEXT code: -> ground pulse/flash to trunk; cancel consultation hold.

- AC:

  Push the aggregate key during the call -> ground pulse / trunk flash; (WABE: PUEXT for AC not necessary).

5.8.9.6 Suffix Dialing To Remote System

Because lines with loop start signaling do not have any criteria for end-of-dial (evaluated or not evaluated), the OpenScape 4000 can be in the 'talking state' although the remote system is in the busy or ringing state. Now you can use remote system features with suffix dialing.

IMPORTANT: Send the (suffix) dialing to the remote system with the signaling method (-outgoing: DIP or DTMF) that is assigned to the line. This is not a cross-network feature. If you have configured a line for suffix dialing (COT: OVRA & USD set), then every dialing is sent to the remote system as suffix dialing. This means that features that are controlled by suffix dialing are not possible in the OpenScape 4000. This affects redial, tracing, and DTMF transmission.

5.8.9.7 Configuration Notes

The following notes apply to all applications (grounding/flash to trunk, suffix dialing after grounding, and picking up after a consultation hold):

- This setting is valid for BWMSCH lines. The same basically applies to other lines (see PTIME). In PTIME TBLK (corresponds to CIRCIDX in TACSU) check that BWMSCH L3 = 240 ms and L4=120 ms; These may have to be adapted to fit the line that is connected.
- You must set OVRA in the COT of the trunk circuit.
- The application only functions when the trunk circuit for the outgoing seizure is reached over the CO (WABE) digital analysis result.

For grounding and flash to the line, the following applies:

- Configure the digital analysis result OPROVR in WABE.

To pick up a consultation hold with TC-SL coupling, the following applies:

- Configure the digital analysis result PUEXT in WABE. In the COT of the trunk circuit, you must set CONS (COT OVRA is not needed for the feature alone).

  The OpenScape 4000 no longer has the COT CONS; a replacement will follow later.

To allow suffix dialing, the following applies (for example, after OPROVR):

- You must set USD in addition to OVRA in the COT.

5.8.10 Testing and Measuring the DTMF and MFC Signals

Different network providers want to be able to measure the DTMF and MFC signals that the SIUs send on the trunks. This is possible with the help of a DigiTe.

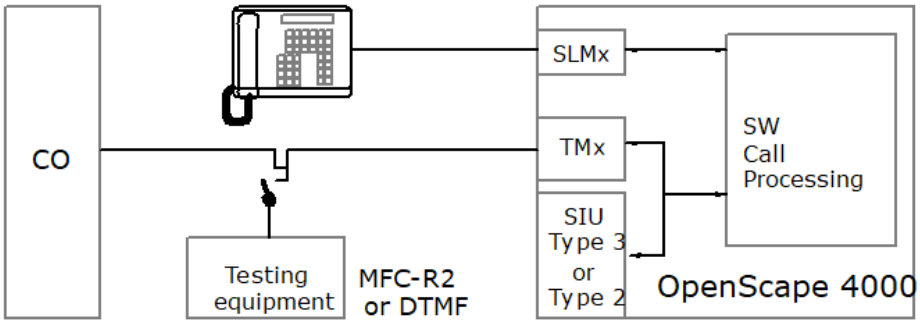


Figure 17: Overview of the Principle: Test of the MFC Signal Transmitter with SIU Type3

5.8.10.1 User Interface

Initiate the tests with the DigiTe from the talking state with the circuit. You can reach the talking state with an incoming call to the DigiTe in the case of MFC or by dialing the correct trunk group code from the DigiTe if you are conducting a DTMF test.

In suffix dialing (without previously pressing the consultation key), dial the FREQTEST code (*xz); the telephone (DigiTe) acknowledges on the display with "*xz EXECUTED". The DigiTe remains connected to the circuit.

The DigiTe CP evaluates and displays each digit in the range from 00 .. 16 according to Table 1. There is no digit time monitoring. If you dial a number > 16, the display shows "INCORRECT INPUT" for 5 s. You can start to dial a new string of digits immediately.

There are no other features possible from the DigiTe, which means that in the state "MFC/DTMP test" only the digit keys and going on hook have any effect (no name keys, disconnect, consultation hold, etc.).

After you dial two digits, the system directly notifies the DH-Länder of this. The system deletes all previously picked up digits. The dialing translation takes place in DH-Länder according to Table 4.8.1. As soon as the system recognizes the next digit as valid, it deactivates the applied signal and sends the new one.

If you dial an invalid signal (signal '-' according to Table 4.8.1), for example, signal 16 as MFC-R2 signal, the system deactivates the pending signal but does not send a new one.

IMPORTANT: The measurement equipment (testing equipment) must guarantee the feeding conditions (direct current conditions) and the termination (alternating current conditions) of the line.

Assign the code *xy to the digital analysis result FREQTEST with the AMO WABE.

Assignment of dialing -> signals:

Dialing/Display	Corresponds to MFC-R2 signals	Corresponds to SOCOTEL/ IBERCOM signals	Corresponds to DTMF digit (16-key)
00	-	Ctrl freq	-
01	1	1	1
02	2	2	2
03	3	3	3
04	4	4	4
05	5	5	5
06	6	6	6
07	7	7	7
08	8	8	8
09	9	9	9
10	10	0	0
11	11	-	*
12	12	-	#
13	13	-	A
14	14	-	B
15	15	-	C
16	-	-	D

5.8.11 Extension of the Override Features With Intercept

If a terminating call reaches a busy user (without intercept, automatic call waiting, etc.), a remote override can result, depending on the configuration (or signaling). If it is not possible to override, the system intercepts the call to the attendant console if COT:IONS is set. This is also basically true for automatic override. You control the feature with the COT parameter IONS.

- Change the COT as follows:
  `CHANGE-COT:cotno,COTADD,IONS;`

5.8.12 Reversed Charges Calls

For Brazil, the system uses a special line signal to signal the ANSWER of a user who is authorized to receive calls with reversed charges to the remote central office.

It uses the authorization to receive reversed charges calls and the COT parameter ACRC.

- Set the COT parameter for calls to the attendant console as follows:
  `CHANGE-COT:COTNO=x,COTTYPE=COTADD,PAR=ACRC;`
- Change the COS as follows:
  `CHANGE-COSSU:TYPE=COS,COS=x,AVCE=REVCHA;`

5.9 Customer Groups, Shared Systems CUG

OpenScape 4000 enables several customers to share a common system. The 16 ITR and 16 DPLN groups afford various possibilities of organizing such a system.

The following options exist:

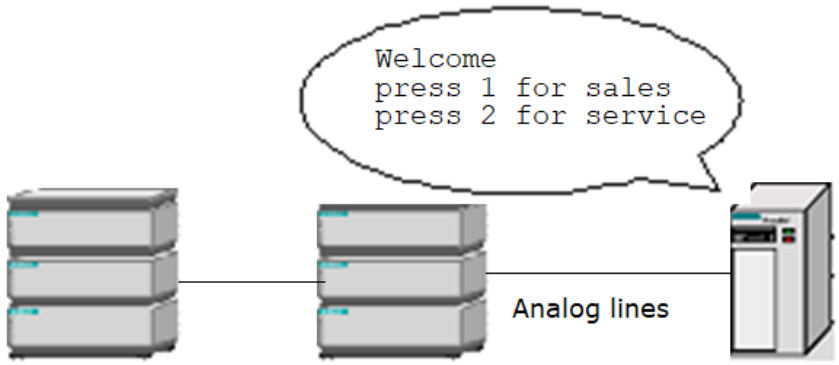
- Assigning stations to any of the 16 ITR groups in such a way that the terminals of one customer may belong to one or several ITR groups and the terminals of the other customers cannot be dialled up internally.
- Assigning the trunk circuits to specific customers but allocating common routing codes to all customers. The DPLN at the terminal causes only those routes to be seized that are allocated for that user station. The ITR group of the trunk circuit will establish connections only to those stations to which traffic is allowed i.e. established via the ITR matrix.
- Trunk circuits may also be required and shared by several customers. In a different arrangement each customer can use his trunk groups in the outgoing direction and share them with other customers in the incoming direction.
- Providing the same service/access code numbers for all customers or entering several code numbers per service. The same applies to the attendant access code or the code for "trunk answer from any station/ universal night answer".
- Implementing the class-of-service changeover either separately for each customer or for all customers by assigning the relevant changeover groups on terminal setup.
- Allocation of NON-VOICE terminals to STN either separately or system-wide by way of the TGER AMO

Features are always enabled or disabled for the complete system with the FEASU AMO. Disabling of features for specific customers is possible only by means of omitting certain access codes for a customer-specific DPLN.

It is not possible to define specific quantities for each customer with the DIMSU AMO (e.g..: 10 hunting groups for customer A and 20 for customer B). This type of layout is always defined for the complete system.

The central speed dialling facility, consisting of 16 groups, is so conceived that groups 1-15 only may be allocated to specific stations. Group 0 is the common group i.e.shared by all stations.

5.10 DTMF Dialing



Users with digital telephone sets can convert keypad key preses into DTMF tones to access functions e.g. Automatic Atendant feature of Phonemail or other IVR products

5.10.1 Feature Description

The DTMF dialing is an optional feature that allows the DTMF signaling in through-connect states.

This case includes anate, analog VoiceMail system, analog IVR, special devices (e.g. dictation) etc. The device can either be configured to have DTMF dialing capability or to allow DTMF signaling from its partner while through-connected (allow to have DTMF suffix dialing in the line), via the DHPAR=DTMFST.

The following situations are not covered before:

- Digital device in through-connect state with another digital device.
- Through-connect states in a conference.

The DTMF dialing enhancements cover the situations above on an administrable basis. In the conference, if at least one member (except that one which is sending digits) requires DTMF signaling, this will be enough to generate DTMF signaling for all conference members. In addition there is a possibility to spare a local station member to hear the DTMF tones. Only conferences up to 4 local conference members will be allowed to receive DTMF signaling.

5.10.1.1 Local DTMF functionality

The flag DHPAR=DTMFST allows to analog devices and DTMFCTRD=YES allows to digital/functional devices the capability to receive dual tone multi-frequency signals received from the through-connected partner. In other words, the digit sender party will be able to compose DTMF signals for the receiving party, when the receiving party requires the DTMF signaling.

The AMO SCSU, DIAL=DTMF functionality remains the same.

5.10.1.2 Network DTMF functionality / Trunks that allow DTMF negotiation.

In an incoming network 2-Party talk state connection and in an outgoing 2-party connection, the DTMF Negotiation feature will transport the necessary trunk (route) DTMF requirements (via access code, automatic or without) and the DTMF station requirements (DTMF flag) after the establishment of the call.

The "Block DTMF in Conference" flag is not transported in the network, since it is considered only a local optional flag.

After the transportation of the feature indicator fields, the digit sender party will be able to compose DTMF signals for the receiving party (remote device), when the receiving party (remote device) requires DTMF signaling.

5.10.1.3 Outgoing DTMF functionality / Trunks that do NOT allow DTMF negotiation

For an outgoing connection the DTMF for the originating party is ruled by the DTMF parameters in AMO RICHT, DTMFCNV parameter.

- WITHOUT = No DTMF conversion for this route,
- FIX = Automatic DTMF conversion,
- SUFDIAL = Activation of conversion by means of suffix dialing (DTMF access code)

When the route is configured with DTMFCNV=FIX, the originator party will allocate a MF circuit Sender to convert the pressed digits into DTMF Signals directly in the voice path.

When the route is configured with DTMFCNV=SUFDIAL, as soon the DTMF access code is dialed, the originator party will allocate a MF circuit Sender to convert digits into DTMF Signals directly in the voice path.

For the analog devices configured with DIAL=DTMF, this RICHT parameter does not apply, since they could be configured to send DTMF signaling by themselves.

5.10.1.4 Incoming DTMF functionality

For incoming network connection, the DTMF activation via SUFDIAL (DTMF access code) is allowed. As soon the DTMF access code is dialed, the called party allocates the MF circuit sender to convert pressed digits into DTMF signals.

Alternatively, for trunks it is possible to set COT parameters AMFC (COT IBBA may also be needed, depending on the customer requirement):

- AMFC - allows in-band DTMF functionality after the call is answered.
- IBBA - allows in-band DTMF functionality before the call is answered (while still in ring state).

IMPORTANT: DTMF negotiation may also take place in these scenarios.

5.10.1.5 DTMF signaling in a conference concept

For conference states, DTMF signaling is allowed if it is requested for at least one of the conference members (except the member who pressed the key). Both analog devices, digital devices, and external partners are able to receive DTMF signaling while in conference. The DTMF signal will be generated by each member of the conference by itself.

To prevent a local partner from hearing DTMF signals while in conference, the station basis flag "Block DTMF in Conference" should be configured. With this flag, the local partner will not hear a local DTMF tone, remaining connected in the conference during the signaling process. This flag should block the DTMF signaling only when it is generated internally, by a local conference member.

The internal DTMF conference signaling will be provided in a conference (limited to 4 conference members).

By default, all external partners of a DTMF conference should be able to hear DTMF automatically, also when they do not require to hear DTMF tone.

In the DTMF conference, each local analog, digital, and external partner should be responsible for the DTMF conversion itself. In the same way the flag DHPAR=DTMFST and DTMFCTRD=YES will set this requirement that the conference member device that has the DTMF flag.

IMPORTANT: Attendant devices and functional devices will not be able to hear DTMF digits in a conference because the DTMF in conference feature shall cover ACD scenarios and neither attendant devices, nor functional devices can be ACD agents.

The following trunks will support DTMF dialing in conference scenarios:

- Analog trunk with signaling type DP (dial pulse)
- Analog trunk with signaling type DTMF
- Analog trunk with signaling type MFCR2
- Digital trunk with signaling type DP - dial pulse
- Digital trunk with signaling type DTMF
- Digital trunk with signaling type MFCR2
- Cornet trunk - ISDN
- PRI trunk
- Ground Start trunk
- E+M trunk

The following device/signaling types will NOT support DTMF dialing in conference scenarios:

- Functional devices (because it cannot become an agent)
- Attendant (because it cannot become an agent or supervisor).
- other trunks not mentioned above, such as cornet analog trunks, will not be implemented.

Notes:

- If in the history of a conference at least one member required DTMF signaling, for the NW party this conference will require DTMF signaling. This will occur because the NW party is not informed that a local conference member disconnected (e.g. only this local conference member, which

disconnects, requires DTMF in this conference). However, once the conference is removed (for example, the conference resources are released and the connection reduces to two parties), the NW is informed.

- If in the history of a conference (with local, and NW orphan members) no member had required DTMF signaling, and in this scenario a new local member which requires DTMF is added to this conference, the NW orphan member(s) will not be informed that at least one member of this conference requires DTMF.
- The case where the single remote party connected to the conference via NW makes a conference in their node, thus having two conferences connected via NW trunk will be handled like specified in the NW Conference and Station Conference Features. They state that when two conferences are linked via a NW connection, the user interface shall operate as two independent conferences. In this case, Call Processing for the DTMF dialing feature will transport the DTMF feature indicator when only one side is in a conference state.

5.10.1.6 Feature Activation when DTMF signaling is active

Feature activations that use a keypad access code during local through-connect states shall not work if the DTMF signaling is activated.

In the OpenScape 4000, when the DTMF signaling is activated on the line, any access code will be considered as keypad dialed numbers and will be converted into DTMF signaling.

5.10.1.7 Affected Talk States

As definition, the station DTMF signaling flag will be active only in basic through-connect talk states, when a station device requires the DTMF signal from it's local partner. This flag will be effective while the station is in direct conversation with another device. For this reason, it will be considered only in the mandatory talk states, in which DTMF signaling is frequently used.

The DTMF mandatory talk states are:

- Basic A-B talk state.
- Both A or B Pty talk consultation mode.
- Consultation out of a conference.
- Camped-on talk state.
- 3-Pty and 4-Party conference talk state.

IMPORTANT: Toggle after consulting out of conference. Toggle,and or 2nd. consultation will not be supported in conference scenarios for the DTMF in conference feature . These states may also represent conference talk states, but they will not be supported , in addition it does not make sense to toggle a call which has an IVR involved (this is the typical situation in which DTMF dialing is required).

For any other states (e.g: ACD Silent Monitoring) the DTMF signaling/dialing feature is not in effect.

5.10.1.8 Digit Displays

- in trunk connections => digits will be shown based on the RICHT configuration.
- other connections (normal talk, conference talk, consultation talk, etc) => digits will NOT be shown.

5.10.2 Service Information

This feature enhancement is intended for the global marketplace.

5.10.3 Generation (example)

The configuration of the DTMF dialing feature can be done either in a station basis or in a trunk (route) basis.

5.10.3.1 DTMF dialing configuration - Station basis

To set a station to require DTMF signaling, the parameter DTMFCTRD (AMO SBCSU) must be set to YES or the parameter DHPAR (AMO SCSU) must be set to DTMFST.

To set a station to block local DTMF signaling while in conference, the parameter DTMFBLK (AMOs SCSU and SBCSU) must be set to YES.

Both configurations can be done while creating a station, or if the station is already created it can be done by the AMO action CHANGE. For example:

- To set the station 3257 as requiring DTMF signaling and do not blocking DTMF signaling while in conference, the following AMO command can be used:

  ```
  CHA-SBCSU:STNO=3257, DTMFCTRD=YES, DTMFBLK=NO;
  ```
- To set the analog station 2201 as requiring DTMF signaling and blocking local DTMF signaling while in conference, the following AMO command can be used:

  ```
  CHA-SCSU:STNO=2201, SPEC=SUFDIAL(or SOD), DHPAR=DTMFST,
  DTMFBLK=YES;
  ```

5.10.3.2 DTMF dialing configuration - Trunk (route) basis

To set a route to require DTMF signaling, the parameter DTMFCNV (AMO RICHT) must be set. The DTMFCNV (DTMF conversion) options are:

- FIX activate fixed dtmf conversion;
- SUFDIAL dtmfcnv activated through suffix dialing (AMO WABE:DAR=DTMFCONV);
- WITHOUT dtmfcnv or dtmfdisp not applicable.

The AMO parameters DTMFDISP, DTMFTEXT and DTMFPULS only indicate how the pressed digits will be shown, what is the text message shown after

the connection and what is the DTMF signaling pulse/pause ration for outgoing trunks (routes).

5.10.4 Relevant AMOs

AMO	Parameter	Language/ Sprache	Description/Beschreibung
SBCSU	MFVGSTRT	d	Dieser die Leitungstechnik (DH) betreffende Parameter ist auf JA zu setzen, wenn die betreffende Endstelle im Gesprächszustand von der Gegenstelle MFV-Töne empfangen soll.
	DTMFCTRD	e	This device handler parameter shall be set to YES for the station, if this station requires to receive DTMF tones from the call partner while in talk.
SBCSU	MFVBLK	d	Dieser Parameter sperrt die akustische Signalisierung von MFV-Signalen im Konferenzzustand. Hinweis: Gesperrt werden können nur lokal erzeugte MFV-Töne.
	DTMFBLK	e	This parameter is able to block a station to hear DTMF tones while in conference. Note: only DTMF tones generated locally can be blocked.
SCSU	DHPAR	d	Dieser die Leitungstechnik (DH) betreffende Parameter ist auf MFVTLN zu setzen, wenn eine Endstelle im Gesprächszustand MFV-Töne von der Gegenstelle empfangen können soll.
	DHPAR	e	This device handler parameter shall be set to DTMFST for the station, if this station requires to receive DTMF tones from the call partner while in talk.
SCSU	MFVBLK	d	Dieser Parameter sperrt die akustische Signalisierung von MFV-Signalen im Konferenzzustand. Hinweis: Gesperrt werden können nur lokal erzeugte MFV-Töne.
	DTMFBLK	e	This parameter is able to block a station to hear DTMF tones while in conference. Note: only DTMF tones generated locally can be blocked.
SCSU	WAHL	d	Wird dieser Parameter auf MFV gesetzt, ist das analoge Gerät in der Lage, MFV-Signale zu verarbeiten.

AMO	Parameter	Language/ Sprache	Description/Beschreibung
	DIAL	e	Set to DTMF allows the analog device the capability of dual tone multi-frequency signals.
WABE	KZP	d	Der Kennzahlpunkt MFVUMS (Aktivierung der MFV-Umsetzung bei der Wahl ins öffentliche Netz) wird für abgehende Amtsleitungsverbindungen und für eingehende Amtsleitungsverbindungen mit MFV-Umsetzung = Nachwahl gesetzt.
	DAR	e	The digit analysis result DTMFCONV (activations of dtmf-conversion when dialing to public network) is used for outgoing trunk calls and for incoming trunk calls with suffix dialing dtmf-conversion set.
RICHT	MFVUMS	d	Dieser Parameter legt die Kennzahl für die MFV-Umsetzung bei abgehenden Richtungen wie folgt fest. FIX = fixe MFV-Umsetzung einschalten; NAWA = MFVUMS wird durch Nachwahl aktiviert; OHNE = keine Verwendung von MFVUMS bzw. MFVANZ-.
	DTMFCNV	e	This parameter determines the dtmf conversion code for outgoing routes. It can be: FIX activate fixed dtmf conversion; SUFDIAL dtmfcnv is activated through suffix dialing; WITHOUT dtmfcnv or dtmfdisp not applicable.
RICHT	MFVANZ	d	Dieser Parameter bestimmt die Anzeigeform bei der MFV-Umsetzung für abgehende Richtungen.
	DTMFDISP	e	This parameter determines the display mode for dtmf conversion for outgoing routes.
RICHT	MFVPULS	d	Dieser Parameter bestimmt das Impuls-/Pauseverhältnis für Codeumsetzer abgehender Richtungen.
	DTMFPULS	e	This parameter determines the pulse/ pause ratio of codetransmitter for outgoing routes.

AMO	Parameter	Language/ Sprache	Description/Beschreibung
RICHT	MFVTEXT	d	Dieser Parameter bestimmt, welcher Text bei der MFV-Umsetzung für abgehende Richtungen auf Endgeräte-Displays angezeigt wird.
	DTMFTEXT	e	This parameter determines which text will be shown on device display for dtmf conversion for outgoing routes.

5.11 ECMA QSIG Protocol

5.11.1 General

The ECMA1 QSIG protocol is based on the European ETSI standard (see Figure 20). A variation of supplementary services supporting the ETSI standard was implemented and tested (see Table 7).

In the meantime, the European Standardization Committee ETSI has released edition 2 (following the ISO standard). The coding of the ETSI edition 1 supplementary services implemented is not compatible with ETSI edition 2 (see Table 6). A new protocol variant ECMAV2 was incorporated with the same feature range as the predecessor (see Figure 20).

The worldwide accepted standardization committee ISO/IEC (International Standardization Organization/International Electrotechnical Commission) included the QSIG standard in the standards catalogue. The coding of the ETSI edition 1supplementary services is not compatible with ISO/IEC edition 1. Consequently, a new protocol (PSS1V2) was incorporated with the same features as the predecessor (see Figure 20).

The QSIG protocol "CorNet NQ V2.1/V2.2/V2.3" describes private signaling based on the ISO standard on one hand, and signaling based on the ETSI standard's Basic Call (edition 3) and Supplementary Services (edition 2) on the other.

IMPORTANT: The private CorNet N elements are no longer transferred in the protocol. This means that the CorNet-N-specific features no longer work.

Use the ECMA1 protocol variant to network Hicom 300 E V2.0 with an OpenScape 4000.

CORNV33 is available for coupling an OpenScape 4000 to CorNet N networks with Hicom 300 V3.3.

A comparison of the various releases is required for the correct use of the protocol variants (ECMA1, PSS1V2 and ECMAV2) for networking an OpenScape 4000 with a third-party PINX (see Table 6).

The continuity of the individual features on the reference points S/T and Q over the various protocols is shown in Table 7.

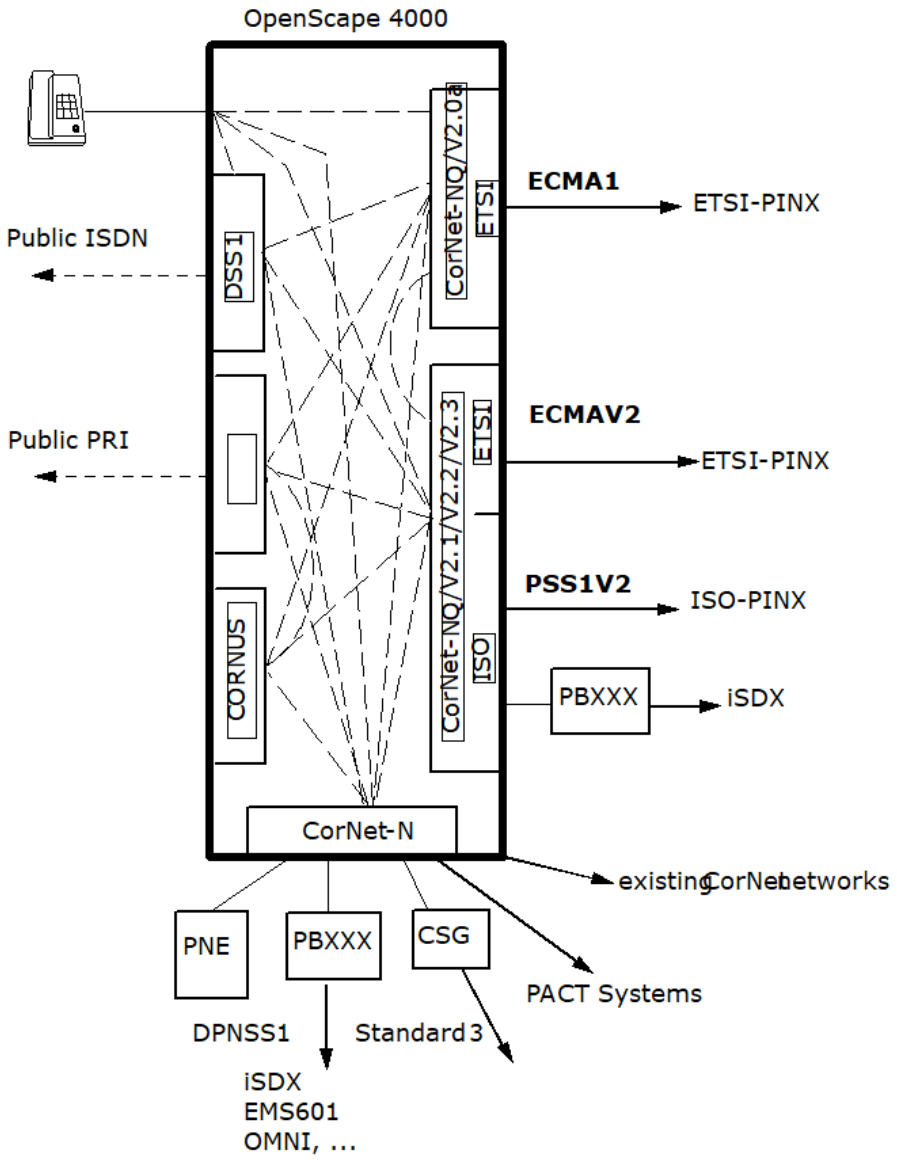


Figure 18: Range of protocol variants

Table 6: Assignment of implemented Supplementary Services to the ETSI/ ISO Standards

	Standards	CorNet - NQ V2.0	CorNet - NQ V2.1/V2.2/V2.3	
	OpenScape 4000 Protocol variant	ECMA1	ECMAV2	PSS1V2
BC SUB	Basic Call	ETS 300 172 Jan. 1994 Second Edition	ETS 300 172 Nov. 1995 Third Edition	ISO/IEC 11572:1996(E) Second Edition Draft Amendment 1 to ISO 11572 Draft Amendment 2 to ISO 11572 Transit Counter ANF
GF HOLD	Generic Functions	ETS 300 239 June. 1993 First Edition	ETS 300 239 Nov. 1995 Second Edition	ISO/IEC 11582:1995(E) First Edition
	Circuit-mode multi-rate bearer services			ISO/IEC 11584:1996(E) First Edition
CNIP/R CONP/R	Name identification supplementary services	ETS 300 238 June 1993 First Edition	ETS 300 238 Nov. 1995 Second Edition	ISO/IEC 13868:1995(E) First Edition
(E) CT	Call transfer supplementary services	ETS 300 261 Nov. 1993 First Edition	ETS 300 261 Nov. 1995 Second Edition	ISO/IEC 13869:1995(E) First Edition
CCBS CCNR	Call completion supplementary services	ETS 300 366 Jul. 1994 First Edition	ETS 300 366 Nov. 1995 Second Edition	ISO/IEC 13870:1995(E) First Edition
CFB CFNR CFU CFPR	Call diversion supplementary services	ETS 300 257 Nov. 1993 First Edition	ETS 300 257 Nov. 1995 Second Edition	ISO/IEC 13873:1995(E) First Edition
PR	Path replacement additional network feature	ETS 300 259 Nov. 1993 First Edition	ETS 300 259 Nov. 1995 Second Edition	ISO/IEC 13874: 1995(E) First Edition

	Standards	CorNet - NQ V2.0	CorNet - NQ V2.1/V2.2/V2.3	
	OpenScape 4000 Protocol variant	ECMA1	ECMAV2	PSS1V2
CLIP CLIR COLP COLR	Identification supplementary services	ETS 300 173 Dec. 1992 First Edition	ETS 300 173 Mai 1996 Second Edition	ISO/IEC 14136: 1995(E) First Edition
CO	Call offer supplementary service	ETS 300 362 Dec. 1994 First Edition	ISO/IEC 14843:1996(E)	ISO/IEC 14843:1996(E)
AOC-S AOC-D AOC-E	Advice of charge supplementary services	ECMA 212, Dec.1994	ISO/IEC DIS 15050	ISO/IEC DIS 15050
MWI	Message waiting indication supplementary service	ECMA 242, June 1996	ISO/IEC 15506	ISO/IEC 15506:

Table 7: Summary of ETSI-DSS1 & PSS1 Supplementary Services with OpenScape 4000

ETSI & Qsig Supplementary Services		Central Office (DTAG)		OpenScape 4000			
		DSS1-AnlAs	DSS1-MgAs	DSS1-AL	DSS1-AnlAs	DSS1-MgAs	PSS1-Qsig
Number & Identification Services:							
DDI	Direct Dialing In	+	na	+	+	na	na
PNP	Privat Numbering Plan	na	na	na	na	na	+
MSN	Multiple Subscr. Number	na	+	na	na	+	na
CLIP	Calling Line Identific. Pres.	+	+	+	+	+	+
CLIR	Calling Line Identific. Restr.	+	+	+	+	+	+

ETSI & Qsig Supplementary Services		Central Office (DTAG)		OpenScape 4000			
		DSS1-AnlAs	DSS1-MgAs	DSS1-AL	DSS1-AnlAs	DSS1-MgAs	PSS1-Qsig
COLP	Connected Line Ident. Pres.	+	+	+	+	+	+
COLR	Conn. Line Ident. Restr.	+	+	+	+	+	+
CNIP/R	Calling Name Ident. Pres.	na	na	na	na	na	+[1]
CONP/R	Connected Name Ident. Pres.	na	na	na	na	na	+[2]
MCID	Malicious Call Identification	+	+	+	-	-	nq
SUB	Sub- Addressing	+	+	+	+	+	+
Call Offering Services:							
(E) CT	(Explicit) Call Transfer	+	+	-	-	+[3]	+
PR	Path Replacement	na	na	na	na	na	+
CFB	Call Forwarding Busy	+	+	-	-	+	+
CFNR	Call Forwarding No Reply	+	+	-	-	+	+
CFU	Call Forwarding Uncondit.	+	+	-	-	+	+
CFPR	Call Forw. Partial Rerouting	+	na	+	-	na	+
CD	Call Deflection	+	-	na	+	+	na
CO	Call Offer	na	na	na	na	na	+
Call Completion Services:							
CW	Call Waiting	na	+	na	na	+	na
HOLD	Call Hold	+[4]	+	-[5]	-[6]	+	+

1 Display dependent on the Pres Ind of the assigned number

2 Display dependent on the Pres Ind of the assigned number

3 "implicit request" only

4 Transmission of the "Notify" message

5 Transmission of the "Notify" message

ETSI & Qsig Supplementary Services		Central Office (DTAG)		OpenScape 4000			
		DSS1-AnlAs	DSS1-MgAs	DSS1-AL	DSS1-AnlAs	DSS1-MgAs	PSS1-Qsig
CCBS	Compl. Calls Busy Subscr.	+	+	+	+	+	+
CCNR	Compl. of Calls on No Reply	+	+	-	-	-	+
Multiparty Services:							
CONF	Add- on Conference	+	+	-	-	-	-
3PTY	Three Party Service	na	+	na	na	+	-
MMC	Meet- Me Conference	-	-	-	-	-	-
Community of Interest Services:							
CUG	Closed User Group	+	+	-	+[7]	-	nq[8]
Charging related Services:							
AOC-S	Advice of Charge at Setup	-	-	+[9]	-	-	-
AOC-D	AOC during the Call	+	+	+	+	+	+
AOC-E	AOC at the End of the Call	+	+	+	+	+	+[10]
Additional Inform. Transfer Services:							
UUS1i	User- User Sign. Serv. 1 implicit	+	+	+	+	+	+
UUS1e	User- User Sign. Serv. 1 explicit	-	-	-	-	-	-
UUS2	User- to- User Sign. Service 2	-	-	-	-	-	-

6 Transmission of the "Notify" message

7 for the 'FUEV' feature only

8 for the 'FUEV' feature only

9 not based on "per call"

10 not "unsolicited" call data

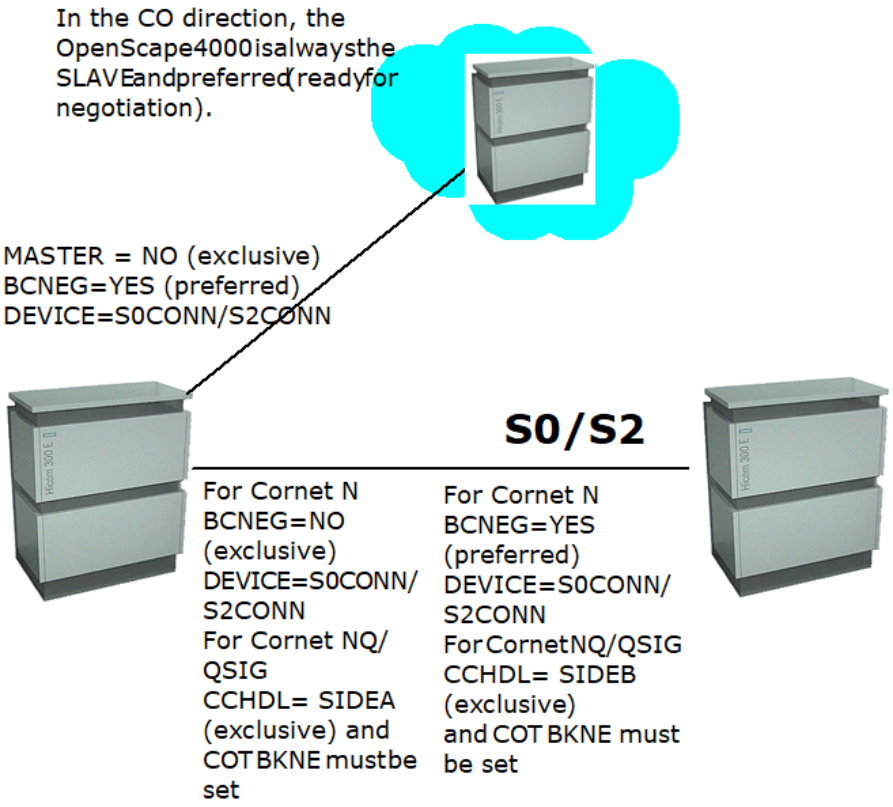
ETSI & Qsig Supplementary Services		Central Office (DTAG)		OpenScape 4000			
		DSS1-AnlAs	DSS1-MgAs	DSS1-AL	DSS1-AnlAs	DSS1-MgAs	PSS1-Qsig
UUS3	User- to- User Sign. Service 3	+	+	+	+	+	+
Other:							
TP	Terminal Portability	na	+	na	na	-	na
FPH	Freephone	-	-	-	-	-	na
MWI	Message Waiting	-	-	-	-	-	+
Generic functional protocol:							
GF	Generic functional protocol	+	+	+	+	+	+
GF-KP	Generic keypad protocol for the Support of SS	-	+	-	-	?	na

Abbreviations:

DTAG	=	Deutsche Telecom AG	AnlAs	=	(Sub-) system interface
AL	=	Trunk	MgAs	=	Point-to-multipoint interface
+	=	implemented	-	=	not implemented
na	=	not applicable	nq	=	supported over CorNet-NQ V2.1

5.11.2 QSIG Protocol Modifications

5.11.2.1 B-channel negotiation



The parameter **BCNEG** is used for controlling B-channel negotiation. Connections that are set up afterwards with "exclusive" are not ready for negotiation. In contrast, lines set up with "preferred" are ready for negotiation and give precedence to exclusive connections.

5.11.2.2 Feature description

ETS 300 172 describes how to resolve collisions. To do this, one side of a link must be declared the A-side and the other side the B-side. A call from the A-side to the B-side has precedence in this configuration (in the event of an exclusive/exclusive or preferred/preferred collision). The necessary declaration is set with the AMO TDCSU.

5.11.2.3 AMO Changes

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
CTIME	AOCT1	d	UEBERWACHUNG DER ANTWORT AUF CHARGE REQUEST
	AOCT1	e	ANSWER SUPERVISION OF CHARGE REQUEST

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
	AOCT2	d	UEBERWACHUNG DER ANTWORT AUF GET FINAL CHARGE
	AOCT2	e	ANSWER SUPERVISION OF GET FINAL CHARGE
COT	BKVE	d	B-Kanalverhandlung
	BCNE	e	B-Channel Negotiation
TDCSU	CCHDL	d	ASEITE BSEITE OHNE
	CCHDL	e	SIDEA SIDEB DONT

5.11.2.4 Instructions for generation

Example

```
CHANGE-TDCSU:DEV=S2CONN, PEN=<ltg-ltu-slot-cct>,
BCGR=b, CCHDL=SIDEA;
```

Default value: DONT

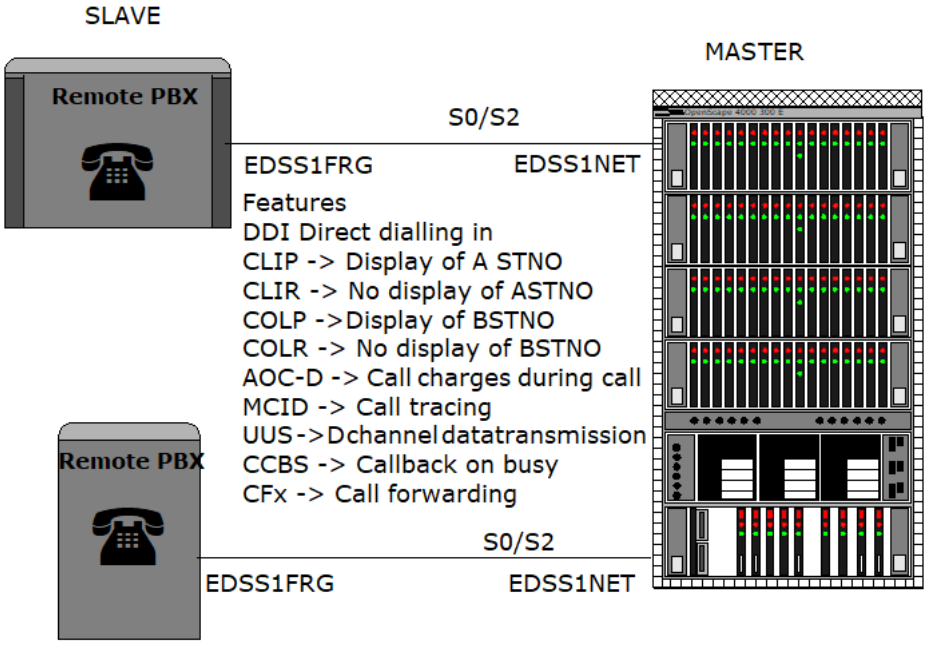
Notes:

- Please note that B-side stations were configured differently by the carrier.
- The COT parameter BCNE must be set for lines using the QSIG protocol so that in the event of a collision, both calls are successfully connected, provided there are B channels available.

5.12 EDSS1 System Interface / Trunk Interface

5.12.1 Feature Description

Remote PBXs can be connected using the EDSS1 trunk interface. In this case, the OpenScape 4000 functions just like a public EDSS1 interface (Germany), which has fewer features.



The EDSS1NET protocol should only be used if the QSIG or Cornet N protocols cannot, or should not, be used, since the provided network-wide features will be limited.

During network planning pay special attention to any PBXs connected using the EDSS1NET protocol: unlike QSIG, the networked partners when using EDSS1 are not equal. The master, for example, can send call information to the slave but not vice versa.

5.12.2 User Interface

The EDSS1-T interface handles like a basic (Telekom) access.

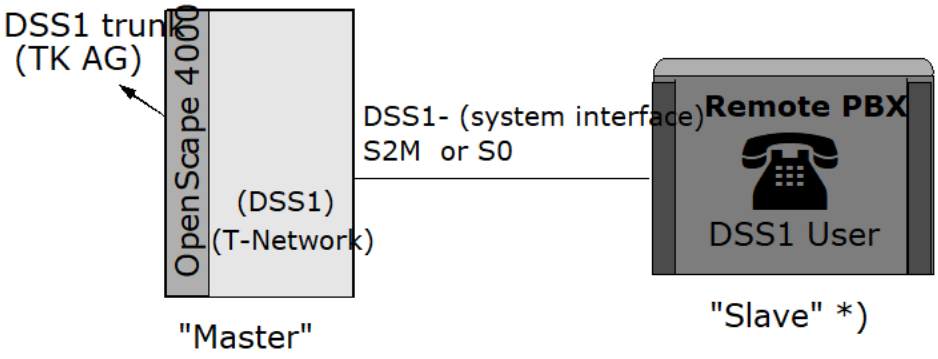
5.12.3 Service Information

- The point-to-multipoint interface is a feature in its own right and not part of the system interface.
- The EDSS1-T network features support the ETSI protocols.
- Adjustments for other providers or countries have not yet been implemented, but can be realised at a later date.
- The following features were implemented:
  - Direct Dialing In on the S0 or S2 interface.
  - Calling Line Identification Presentation (CLIP) / Display of the A station number.
  - Call Screening is supported with regard to E.164 addressing. This allows the validity check of the CLIP received on this line. Unambiguous Call

Screening using CLIP is highly important, as the customer is assigned the call charges.

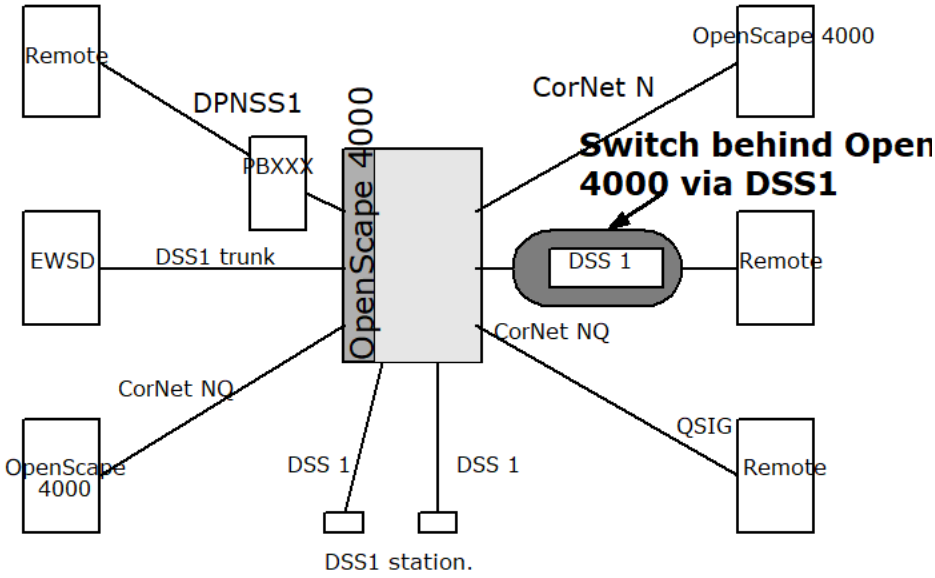
- Calling Line Identification Restriction (CLIR) / Calling stations's number suppression at the called party.
- Connected Line Identification Presentation (COLP) / After CONNECT the calling party sees the actual station number of the called party.
- Connected Line Identification Restriction (COLR) / Suppression of the called party's line identification at the calling party.
- Malicious Call Identification (MCID) / Identification and registration. During a trunk call the called PBX station can instigate the storage of connection-related data in the ISDN CO. The facility message is then transparently transmitted with BA or PRA via the DSS1 gateway system interface to the Telekom AG DSS1 interface.
- The following options can be activated in the ISDN CO for the system interface:
  - Malicious Call identification immediately (MCII) / all incoming and outgoing calls via the Telekom interface are registered at the ISDN CO.
  - Malicious Call identification on request (MCIR) / calls and call attempts are only registered, if MCID was specially activated using a DSS1 gateway. All calls are registered, if MCID was activated in the gateway system. Since a code must be dialled to activate MCID the feature can only be used for 'voice' services.
  - User to User Signalling 1 implicit (UUS1Ii) / D channel user data transmission between two users during connection setup (setup message)and clear down. A maximum of 128 bytes can currently be transmitted.
  - User to User Signalling 3 (USS3) / D channel user information messages transmission in active state. To prevent network overloading, every user with UUS3 authorization is assigned a certain maximum number of user information messages per period (Congestion Control).
  - Advice of Charge During Call (AOC-D) / call charge information is transmitted from the Telekom DSS1 access to the DSS1 gateway system. The information is then processed in the OpenScape 4000 module INCDR. The currently valid call charges are then calculated using tariff tables and Least Cost Routing information. The derived call charges are then transmitted to the CP for further transmission to the DSS1 gateway. Call charges are accounted according to the INCDR regulations.
  - AOC-E is included in AOC-D.
  - The OpenScape 4000 does not only transmit call charge information generated by the Telekom. AOC-D is also linked to the internal OpenScape 4000 INCDR interface and therefore allows accounting of PBXs connected via the DSS1 interface. Advice of Charge End of call / Transmission of call charge information at the end of the connection.
- The ISDN trunk interface was expanded by the following features:
  - Completion of Calls to busy Subscribers (CCBS) / Callback on busy. Callback on busy to external systems is supported.
  - Call Diversion Partial Rerouting / Call forwarding using rerouting.
  - Call Diversion Notification / Call forwarding information is signalled to the involved stations.

- The features listed below supporting the DSS1 protocol, are either not useable at the DSS1-T-network interface, or have not been implemented for a system interface:
  - Multiple Subscriber Number (MSN)/ Multiple subscriber number of a basic access
  - Terminal Portability (TP)
  - Call Waiting (CW)
  - Closed User Group (CUG)
  - Three Party Service (3PTY)
  - Conference Call Add-on (COF) / Conference call
  - Freephone Service / 130 FPH Service
  - Call Transfer (CT)
  - User User Signalling 1 explicit (UUS1e) / Transmission of user data 1 e
  - User User Signalling 2 (UUS2) / Transmission of user data 2
  - Call Diversion (CFB, CFU, CFNR) for the entire T reference point
  - Call Hold HOLD / Call parking
  - Call Deflection (CD) / Call forwarding during call, activated by B station
  - Advice of Charge Start (AOC-S) / Call charge information during connection setup
- Any local features which do not affect the EDSS1-T protocol can be activated (conference, callback to internal station, etc.).
- The COT parameters FWDN/FNAN/CFVA/CBFN may not be set at the system interface, as the connected functions at the T-reference point (on the network side) are not defined.
- Interworking between different protocols



*) The "Slave", like the "Master", can have access to the D trunk

Interworking:



- The OpenScape 4000 supports the following numbering plans for EDSS1-T: unknown and E.164. PBXs networked using E-DSS1-T should always use the numbering plan E.164.
- A COP parameter (IMEX) can define, whether or not for incoming calls with TON=unknown (implicit STNO) the TON is to be modified into an explicit STNO with a different TON.

5.12.4 Relevant AMOs

AMO	Parameter	Sparche/ Language	Beschreibung/Description
COP	IMEX	d	"Implizit-to-Explizit" Ist der type-of-number in der Ankommenden called-number gleich unknown (dies entspricht einer impliziten Rufnummer), so wird bei gesetztem Parameter versucht, die Prefixe zu entfernen und die Nummer in eine Explizite zu verwandeln (mit type-of-number subscriber, national oder international).
	IMEX	e	"Implizit-to-Explizit": If the type-of-number of an incoming call = unknown (implicit station number), the system tries to remove the prefixes and change the number into an explicit station number (with type-of-number= subscriber, national or international), provided this parameter is set.
	RMSG	d	"Restart-Message-after-Startup" Nach dem Aufbau der Layer 1 bis 3 wird als erstes eine Restart Meldung an den Partner gesendet, um zu Signalisieren, dass alle eingerichteten B-Kanäle frei sind. Achtung ! Diese Funktion darf nicht gleichzeitig beim User und beim Netz aktiv sein, sonst entstehen Probleme, bedingt durch die Restart-Kollision.
	RMSG	e	"Restart-Message-after-Startup": After layer 1 to 3 setup, a restart message is sent to the partner PBX to signal that all configured B channels are free. Attention ! To avoid problems caused by the restart collision, this function may not be active simultaneously on the user and the network side.

AMO	Parameter	Sparche/ Language	Beschreibung/Description
COT	BKVE	d	"B-Kanal Verhandlung für EDSS1" Dieser Parameter (respektive diese Funktion) muss sowohl beim User wie auch beim Netz aktiv sein. Die bereits vorhandene B-Kanal-Kollisions-Auflösung (preferred<->exclusiv und exclusiv<->prefered) wird dann ergänzt um die Fälle exclusiv<->exclusiv und prefered<->prefered. Achtung ! Dies funktioniert nur dann, wenn eine Seite als Netz und die andere als User eingerichtet ist (Leitungen mit der PROTVAR EDSS1NET oder EDSS1NETR gelten als Netz-Seite, alle anderen als User-Seite).
	BCNE	e	"B channel negotiation for EDSS1": This parameter (or this function) must be active both on the user and on the network sides. The existing B channel collision solution (preferred<->exclusive and exclusive<->preferred) is then enhanced by the cases exclusive<->exclusive and preferred<->preferred. Attention! This only works, if one side is configured as network and the other as user (lines using PROTVAR EDSS1NET or EDSS1NETR are the network side, all others are the user side).
	BKDU	d	"B-Kanal Durchschalten mit Melden" Zur Partneranlage, wo sich der A-Teilnehmer befindet, wird immer Frei- oder B-Ton von OpenScape 4000 gesendet. Erst beim Melden des B-Teilnehmers werden die Sprech-Wege End-End geschaltet. Dies verhindert, dass z. B. der B-Teilnehmer Informationen sendet, ohne dass der A-Teilnehmer Gebühren bezahlt (weil die Gebührenzählung erst mit Melden aktiviert wird).
	BCCC	e	"B channel call completion before answer": The OpenScape 4000 always sends free or busy tones to the partner PBX with the A station. Only when the B station answers the voice paths are connected through. This way, the B station cannot send information without any call charges assigned to the A station (because call charging is activated with answering).

AMO	Parameter	Sparche/ Language	Beschreibung/Description
	TR6Q	d	"Querverkehr zu Anlage ohne Töne" In der Alert- oder Disconnect-Meldung von der Partneranlage wird anhand des Progressindicators geprueft, ob ein Frei- oder B-Ton angelegt ist. Wenn nicht, so wird in Richtung zum A-Teilnehmer ein eigener Ton eingespeist. Sendet die Partneranlage eine Setup-Meldung ohne Ziffern, so reagiert OpenScape 4000 bei Voice und 3.1kHz-Audio Verbindungen mit dem Anschalten von Wählton (dies wird in der Setup-Ack-Meldung mit dem Progressindicator signalisiert).
	TR6T	e	"Tie lines to system without tones": The progress indicator checks the Alert or Disconnect message of the partner system, to see if a free or busy tone is injected. If not, the system injects its own tone in the direction of the A station. If the OpenScape 4000 receives a setup message without digits from the partner system, it injects the dial tone for Voice and 3.1 kHz audio connections (signalled by the progress indicator in the setup ACK message).
	NCHD	d	"No-Charge-During-Call" Zur Partner-Anlage werden nur AOC-E Informationen am Ende des Gespräches gesendet.
	NCHD	e	"No-Charge-During-Call": AOC-E information is sent to the partner PBX at the end of the call.
	UUS1	d	"User-User-1i" Bei den Protokollen EDSS1NET und EDSS1NETR wird eine UUS1i-Anforderung nur dann akzeptiert, wenn der Parameter gesetzt ist.
	UUS1	e	"User-User-1" The EDSS1NET and EDSS1NETR protocols only accept a UUS1 query if this parameter is set.
	UUS3	d	"User-User-3" Bei den Protokollen EDSS1NET und EDSS1NETR wird eine UUS3-Anforderung nur dann akzeptiert, wenn der Parameter gesetzt ist.
	UUS3	e	"User-User-3" The EDSS1NET and EDSS1NETR protocols only accept a UUS3 query if this parameter is set. (E V3.0)

AMO	Parameter	Sparche/ Language	Beschreibung/Description
	ETSC	d	"ETSI-Conform" Dort wo ETSC gesetzt wir, werden nur noch UU-Informationen übertragen, welche entsprechend dem ETSI-Protokoll angefordert (requested) worden sind.
	ETSC	e	"ETSI-Conform" If ETSC is set, only UU information is transmitted which were requested in accordance with ETSI protocol.
	USBT	d	"UUS3 Anforderung vom B-Teilnehmer" Wird der COT-Parameter USBT gesetzt, so ist dies auch dem gerufenen Teilnehmer (B-Tln) gestattet (Network Option).
	USBT	e	"UUS3 Request from B Party" If the COT parameter USBT is set, the B party can also request UUS3 (Network Option)
	USCC	d	"UUS3-Congestion-Controll" Ist USCC nicht gesetzt, wird eine Überprüfung der Datenmenge verhindert und unbeschränkt viele UU-Informationen können übertragen werden (wichtig für proprietäre Leistungsmerkmale wie CMI, NW CHESE, ...).
	USCC	e	"UUS3-Congestion-Control" If USCC is not set, the data quantity is not checked. This allows transmission of unlimited UU information (important for proprietary features such as CMI, NW CHESE, etc.)
	USCD	d	"User-User-Call-Diversion" Wenn der COT-Parameter USCD gesetzt ist, wird eine allfällige UUS-Anfrage nicht zum Umleitziel weiter geleitet.
	USCD	e	"User-User-Call-Diversion" If the COT parameter USCD is set, the UUS query is not transferred to the forwarding destination..
	CCRO	d	"Call-Completition-Retention-Option" Wenn dieser Parameter gesetzt ist, wird die Retention Option eingeschaltet. Ansonsten wird bei erneut besetztem B-Teilnehmer wie bis anhin automatisch ein neuer Rückruf eingetragen. CCRO wird nur gehend geprüft.

AMO	Parameter	Sparche/ Language	Beschreibung/Description
	CCRO	e	"Call-Completion-Retention-Option" This parameter activates the retention option. Otherwise, a new callback is entered at the B station if it becomes busy again. CCRO is only checked for outgoing connections.
DIMSU	DSS1SCRD	d	Anz. der Screening Datensätze bei E-DSS1 Verbindungen
		e	Number of Screening data records for EDSS1 connections.
	DSS1SCRP	d	Anz. der Screening Patterns für E-DSS1 Verbindungen
			Number of Screening Patterns for E-DSS1 connections
KNFOR	TON	d	Neue Parameterwerte INTERPRE ->Internationale Rufnummer mit Prefix NATIOPRE ->Nationale Rufnummer mit Prefix
		e	Neue Parameterwerte INTERPRE ->Internationale Rufnummer mit Prefix NATIOPRE ->Nationale Rufnummer mit Prefix
	SCRE	d	Neuer Parameterwert TRANSP -> Transparent - Screening indic. bleibt unverändert
		e	New parameter transparent - screening indicator remains
	SENDCALL	d	Senden der Calling Number
	SENDCALL	e	send calling number
	SENDCONN	d	Senden der Connected Number
	SENDCONN	e	send connected number
	OVRDCAT	d	Override Category Anzeige der geheimen calling/connected RNR J /N
	OVRDCAT	e	override category display secret calling / connect number Y/ N
LODR	LWREL	d	SENDCOMP -> das schicken von Wahlblöcken ist abgeschlossen

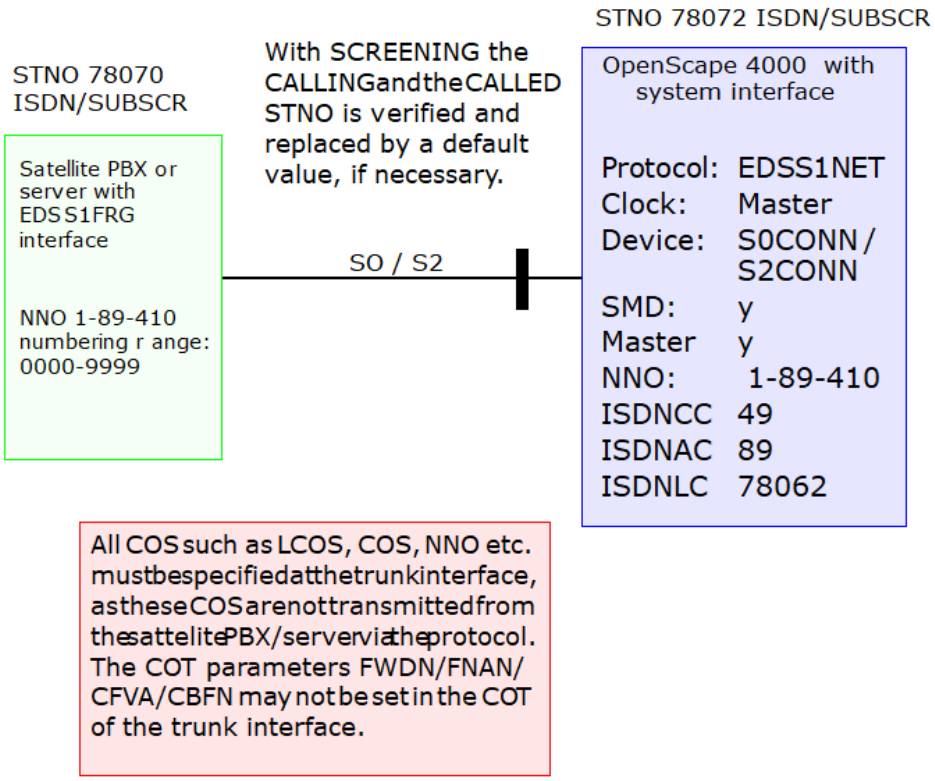
AMO	Parameter	Sparche/ Language	Beschreibung/Description
		e	SENDCOMP -> sending number blocks completed
PRODE	PROTVAR	d	Neue bzw. geänderte Parameterwerte: ECMAV2 -> Protokoll qsig etsi ETS 300 172 3rd. ECMAV2R -> Protokoll qsig etsi ETS 300 172. PSS1V2 -> Protokoll qsig iso ISO/IEC 11572 PSS1V2R -> Protokoll qsig iso ISO/IEC 11572 EDSS1NET ->Protokoll EDSS1 net side EDSS1NETR -> Protokoll EDSS1 net side Reserve
		e	Neue bzw. geänderte Parameterwerte: ECMAV2 -> Protokoll qsig etsi ETS 300 172 3rd. ECMAV2R -> Protokoll qsig etsi ETS 300 172. PSS1V2 -> Protokoll qsig iso ISO/IEC 11572 PSS1V2R -> Protokoll qsig iso ISO/IEC 11572 EDSS1NET ->Protokoll EDSS1 net side EDSS1NETR -> Protokoll EDSS1 net side Reserve
SCREN		d	Neuer AMO Festlegen von Nummernbereichen und deren Prüfung
		e	New AMO Screening of numbering ranges
TDCSU	PROTVAR	d	Neue Parameterwerte: ECMAV2 -> Protokoll qsig etsi ETS 300 172 3rd. ECMAV2R -> Protokoll qsig etsi ETS 300 172. PSS1V2 -> Protokoll qsig iso ISO/ IEC 11572 PSS1V2R -> Protokoll qsig iso ISO/IEC 11572 EDSS1NET -> EDSS1 net side EDSS1NETR -> EDSS1 -> net side Reserve
		e	New parameter values: ECMAV2 -> protocol QSIG ETSI ETS 300 172 3rd. ECMAV2R -> protocol QSIG ETSI ETS 300 172. PSS1V2 -> protocol QSIG iso ISO/IEC 11572 PSS1V2R -> protocol QSIG iso ISO/IEC 11572 EDSS1NET -> EDSS1 net side EDSS1NETR -> EDSS1 -> net side Reserve
	UUSCCX	d	"User-User-Signalling-Congestion-Controll-Counter-X" Jedem UUS3 berechtigten Teilnehmer steht eine bestimmte maximale Anzahl UU-Informations-Meldungen (Zähler-X) pro Zeiteinheit (UUS3T2) zur Verfügung.

AMO	Parameter	Sparche/ Language	Beschreibung/Description
	UUSCCX	e	"User-User-Signalling-Congestion-Control-Counter-X" Every user with UUS3 authorization is assigned a certain maximum number of UU information messages (counter-x) per period (UUS3T2).
	UUSCCY	d	"User-User-Signalling-Congestion-Controll-Counter-Y" Anzahl UU-Informations-Meldungen (Zähler-X) pro Zeiteinheit (UUS3-T2) zur Verfügung. Unabhängig davon, ob er sein Kontingent genutzt hat oder nicht, wird in einem regelmässigen Zeitinterwall (UUS3T2) das verbleibende Kontingent um eine bestimmte Anzahl (Zähler-Y) aufgestockt bis maximal die ursprüngliche Menge (Zähler-X) erreicht ist.
	UUSCCY	e	"User-User-Signalling-Congestion-Control-Counter-Y" Every user with UUS3 authorization is assigned a certain maximum number of UU information messages (counter-x) per period (UUS3T2). Regardless of whether or not the user has used his assigned quantity, the remaining number of messages is increased by a certain number (counter-y) in periodic intervals (UUS3T2) until the original maximum number of messages (counter-x) is reached.
CTIME	UUS3T1	d	"User-User-Signalling-Timer-1" Der Timer UUS3-T1 bestimmt, wie lange die Netzwerkseite auf die Antwort einer ausgesandten UUS-Anfrage warten soll.
	UUS3T1	e	"User-User-Signalling-Timer-1" The UUS3-T1 timer defines the time the network side waits for the response to a transmitted UUS request.
	UUS3T2	d	"User-User-Signalling-Timer-2" Jedem UUS3 berechtigten Teilnehmer steht eine bestimmte maximale Anzahl UU-Informations Meldungen pro Zeiteinheit zur Verfügung, welche durch den Timer UUS3T2 bestimmt wird.
	UUS3T2	e	"User-User-Signalling-Timer-2" Every user with UUS3 authorization is assigned a certain maximum number of UU information messages .

5.12.5 Configuration of the EDSS1 system interface with Screening

IMPORTANT: Verification of the calling and the called number is not required by the system interface, as the station numbers are checked by the network provider who replaces a wrong station number by a predefined number, if necessary. If screening is not performed by the carrier the OpenScape 4000 will check the numbers.

5.12.5.1 Configuration of the system interface



The user and the network side must be configured separately using AMO TDCSU.

	Network side	User side
Protocol	EDSS1NET	EDSGER
Connection	S0CONN	S0COD
ISDN STNO	78072 (ISDN E164 / SUBSCR)	78070 (ISDN E164 / SUBSCR)

- Allocate memory for AMO SCREN

```
ADD-DIMSU:DSS1SCRD=10, DSS1SCRP=30, TYPE=NET;
```

- Configure trunk groups and COT/COP parameters

```
ADD-BUEND:TGRP=140, NAME=EDSS1_TRUNK INTERFACE, NO=2;

ADD-COT:COTNO=140,PAR=NTON&AEOD&FWDN&CBBN&BLOC&NLCR&
TSCS&DFNN&NLRD&CFTR&VCMN&BCNE;

ADD-COP:COPNO=140,PAR=L3AR;
```

- Configure circuit

```
EINR-TDCSU:ART=NEU, LAGE=1-02-079-5, COTNR=140,
 COPNR=140, WABE=0, VBZ=0,
COS=90, LCOSS=7, LCOSD=7, SATZNR="DSS1 NETSIDE",
 ZLNR=40,PROTVAR="EDSS1NET",
SEGMENT=1, KNNR=1-89-410, FIDX=1, CARRIER=4, ZONE=LEER,
 COTX=140, AULX=5,
GER=S0VERB, ANZ=1, INBETR=J, BUNR=140, SUCHART=AUF,
 MASTER=JA, SMD=JA,
CNTRNR=0, BKVER=N;
```

- Configure the route to the external PBX. Node 1-89-410 NPI ISDN, TON=Subscriber. For TON=national and international separate routes must be configured, if required.

```
ADD-RICHT:MODE=LRTENEW, LRTE=140, LSVC=ALL, NAME=DSS1
 NETSIDE, TGRP=140,
DNNO=1-89-410, ROUTOPT=NO, REROUT=NO, DTMFCNV=FIX,
 DTMFDISP=DIGITS,
DTMFTEXT="MFV_NW", PLB=YES;
```

- Configure LODR and LDAT AMOs to the node 1-89-410, NPI ISDN, TON=Subscriber.

```
ADD-LODR:ODR=140, CMD=ECHO, FIELD=2;

ADD-LODR:ODR=140, CMD=ECHO, FIELD=3;

ADD-LODR:ODR=140, CMD=NPI, NPI=ISDN, TON=SUBSCR;

ADD-LODR:ODR=140, CMD=END;

ADD-LDAT:LROUTE=140, LSVC=ALL, TGRP=140, ODR=140,
 LAUTH=1,
CARRIER=4, ZONE=EMPTY;

ADD-LDPLN:LDP=0-78070-X, LROUTE=140, LAUTH=1;
```

5.12.5.2 A station number verification (screening)

- Station number verification is not required for this function and need only be configured if necessary.
- Configuration of the number verification for TON=Subscriber If required, separate SCREEN data must be configured for TON=national and international.
- A station number from 0000 to 9999 are transmitted in TON=Subscriber.

```
ADD-SCREN:TYPE=SCRPATT, SCRPPLAN=1, SCRP=78070XXXX;
```

- The default station number (DNO) is expanded by the ATND code (0) of the external PBX.

```
EINR-SCREN:ART=SCRDATEN, UKNNR=1-89-410, DRNR=780700,
 DRNRTYP=SUBSCR,
ARNRTYP=SCREEN, ARNRANZ=CLIPSTD, BRNRTYP=KEINSCR,
 BRNRANZ=COLPSTD,
SCRPPLAN=1, SCRPTYP=SUBSCR;
```

5.12.5.3 EDSS1 Use Side

- A OpenScape 4000 at the EDSS1 system interface must be configured as a OpenScape 4000 to the public CO.

```
ADD-BUEND:TGRP=140, NAME=EDSS1_CO, NO=2;

ADD-COT:COTNO=140,
 PAR=NTON&AEOD&FWDN&CBBN&BLOC&NLCR&TSCS&
DFNN&NLRD&CFTR&VCMN&BCNE;

ADD-COP:COPNO=140, PAR=L3AR;

EINR-TDCSU:ART=NEU, LAGE=1-02-103-5, COTNR=140,
 COPNR=140, WABE=0, VBZ=0,
COS=90, LCOSS=7, LCOSD=7, SATZNR="DSS1 NETSIDE",
 ZLNR=10, PROTVAR="EDSBRD",
SEGMENT=1, TCHARG=N, ANZUNT=0, KNNR=1-89-110, ALARMNR=0,
 FIDX=1, CARRIER=4,
ZONE=LEER, COTX=140, AULX=5, GER=S0AMT, ANZ=1, INBETR=J,
 BUNR=140, SUCHART=AUF;
```

- Configure the route to the external PBX. Node 1-89-410 NPI ISDN, TON=Subscriber. If required, separate routes must be configured for TON=national and international.

```
ADD-LODR:ODR=140, CMD=ECHO, FIELD=2;

ADD-LODR:ODR=140, CMD=ECHO, FIELD=3;

ADD-LODR:ODR=140, CMD=NPI, NPI=ISDN, TON=SUBSCR;

ADD-LODR:ODR=140, CMD=END;

ADD-RICHT:MODE=LRTENEW, LRTE=140, LSVC=ALL, NAME=DSS1
 USERSIDE, TGRP=140,
DNNO=1-89-110, REROUT=NO, DTMFCNV=FIX, DTMFDISP=DIGITS,
 DTMFTEXT="DTMF",
DTMFPULS=PP300, PLB=YES;

ADD-LDAT:LROUTE=140, LSVC=ALL, TGRP=140, ODR=140,
 LAUTH=1, CARRIER=4, ZONE=EMPTY;

ADD-LDPLN:LDP=0-78062-X, LROUTE=140, LAUTH=1;
```

5.13 EURO-ISDN Exchange Interface

The OpenScape 4000 can be connected as an NT2 unit at the V reference point (TO basic access and T2 primary rate access) of the European EURO-ISDN network.

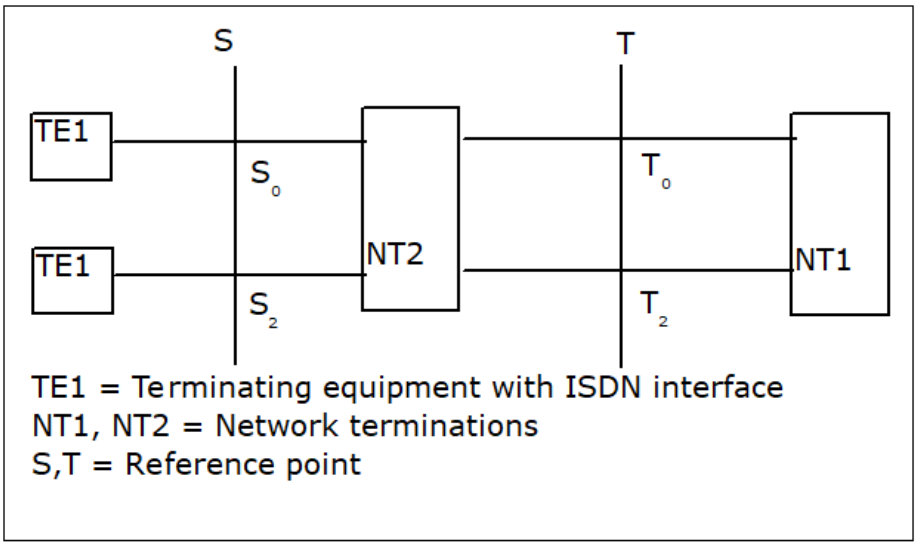


Figure 19: Reference model

The supplementary services supported on the exchange interface onward are as follows:

- Direct Dialing In (DDI) An exchange subscriber can dial straight through to a OpenScape 4000 user. In this case the OpenScape 4000 user receives a different type of call signalling (trunk call) from that used for inside calls.
- Calling Line Identification Presentation (CLIP) The number of the calling party appears on the display at the called terminal. The number is displayed during the ringing phase.
- Calling Line Identification Restriction (CLIR) The calling party can suppress the call number display by pressing a key at the start of an outpoing call.
- Connected Line Identification Presentation (COLP) The number of the user who has actually been accessed is indicated on the display of the calling terminal. The number is displayed when the connection is switched through.
- Connected Line Identification Restriction (COLR) Display of the user who has been accessed is suppressed by the called terminal.
- User-to-User Signaling (UUS) Communication between terminals.
- Subaddressing (SUB) The ISDN subaddress is used for the more precise addressing of subcomponents within the user equipment selected with the ISDN number.

The following figure illustrates the structure of the ISDN addres:

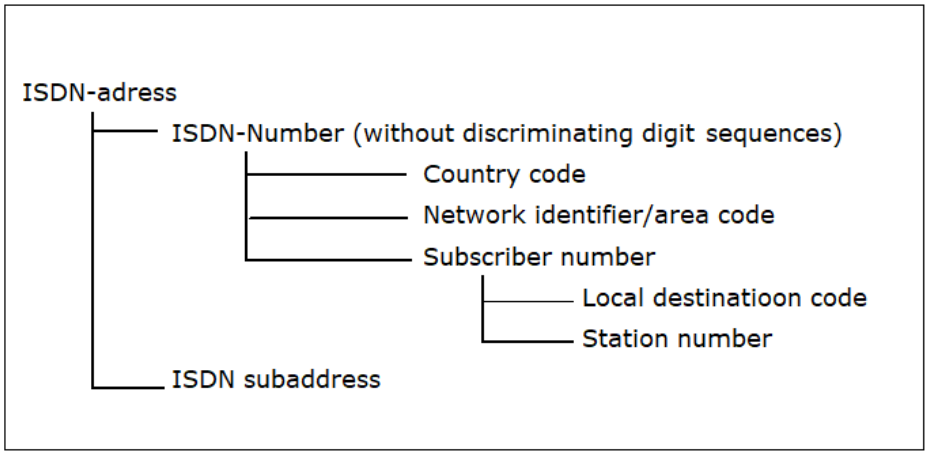


Figure 20: Structure of the ISDN address

5.13.1 Direct Dialing In (DDI)

DDI enables users to call parties in private ISDN networks directly via public ISDN using the ISDN numbering plan. The ISDN exchange sends the DDI number to the private ISDN. The DDI number consists either of the complete ISDN number (country code, area code and subsciber number) or part of it, the minimum being the subscriber number. Which parts are transmitted varies from one exchange to another. The discriminating digit sequences for national and international calls (e.g. 00 and 0 or 16 in France for inter-zone calls) are not part of the DDI number and are therefore not provided by the exchange. The following components of the home ISDN NUMBER must always be specified in connection with EURO-ISDN trunk circuits:

- Country code (e.g. 49 for Germany)
- Area code (e.g. 89 for Munich)
- Local destination code (e.g. 7007)

The discriminating digit sequences for national and international calls must also be provided:

- International prefix (e.g. 00)
- National prefix (e.g. 0)

The components of the the home ISDN number are required for DDI so that the DDI number sent by the exchange can be reduced to the simple subscriber number, which in turn is necessary for correct digit analysis in the OpenScape 4000 system.

Example: Configuration of trunk circuits on the T2 primary rate access.

- Assign module DIU (2 PCM30 routes):

```
ADD-BCSU:MTYPE=DIU, LTG=gg, LTU=uu, SLOT=bbb,
 PARTNO=Q2096-X;
```

- Assign trunk group for 30 B-channels:

```
ADD-BUEND:TGRP=x, NAME="ISDN-S2AMT", NO=30;
```

- Assign S2 trunk circuit with 30 b channells in module

```
ADD-TDCSU:OPT=NEW, PEN=gg-uu-bbb-0/1, COTNO=number,
 COPNO=number,
LCOSV=number, LCOSD=number, PROTVAR=ETSI, ISDNIP=00,
 ISDNNP=0,
ISDNCC=49, ISDNAC=89, ISDNLC=722, NNO=number, DEV=S2COD,
 TGRP=x, BCGR=1;
```

Example: Configuration of trunk ciruits on the T0 basic access.

- Assign module STMD (8 xS0 interfaces)

```
ADD-BCSU:MTYPE=DIU, LTG=gg, LTU=uu, SLOT=bbb,
 PARTNO=Q2174-X;
```

- Assign trunk group for 8 x S*0*-interfaces (2 B-channels ea.):

```
ADD-BUEND:TGRP=y, NAME="ISDN-S0AMT", NO=16;
```

- Assign 8 S0 trunk circuits in module

```
ADD-TDCSU:OPT=NEW, PEN=gg-uu-bbb-0, COTNO=number,
 COPNO=number, LCOSV=number,
LCOSD=number, PROTVAR=ETSI, IISDNIP=00, ISDNNP=0,
 ISDNCC=49, ISDNAC=89,
ISDNLC=722, NNO=number, DEV=S0COD, NO=8, TGRP=y;
```

5.13.2 Calling and Connected Number Displays (CLIP/CLIR and COLP/COLR)

Connections via EURO-ISDN exchange lines transport various info-numbers in as additional connection information, which include the "calling line information" and the "connected line information" (respectively shortened to "calling number" and "called number"). These info-numbers not only appear in the telephone displays of the connection parties; many system features use these info-numbers as destination numbers at later stages in a call setup, e.g. for recall, callback, etc. For this reason, an Info-Number Signalling system exists (INS), whose function is to ensure that any node-specific modification of these numbers for transport is carried out in such a way that the info number string (including the necessary route codes etc.) can be reconstructed by any system or node at any stage in the connection setup path. Networks transport the info-numbers in explicit format throughout, wherever possible. Explicit info-numbers do not contain the full dialled number string, but only the root number and additional information elements indicating the breakout codes, prefix codes, area codes, the numbering plan identifier (NPI=ISDN for EURO-ISDN) and Type of Number (TON, i.e. INTERNAT, NATIONAL or LOCAL). Since call number information of this type is not suitable for display or further processing within a system or node, each node converts incoming explicit calling number information into an implicit format for internal purposes. The implicit calling number information will contain all the appropriate code digits (breakout and prefix codes) and have the type of number attribute TON = UNKNOWN. In the outgoing direction, the implicit format is converted back into an explicit format. The conversion is always carried out with the station number modification function, i.e. depends on AMO settings specific to each node. The following example shows an ISDN exchange and a destination node, with the intervening network.

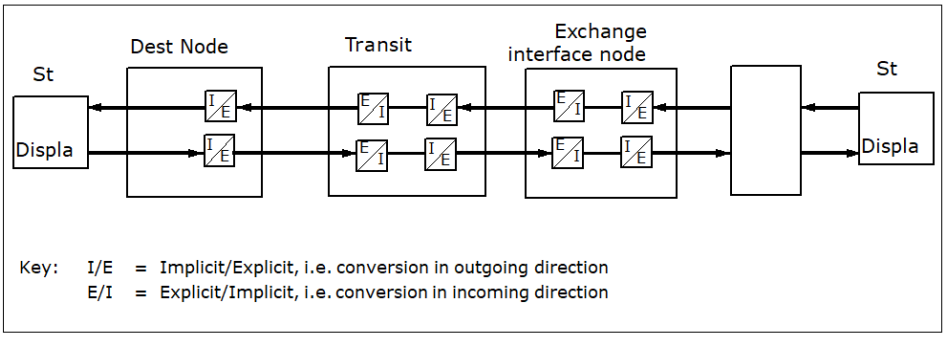


Figure 21: Format dependant information number signalling

Two parallel methods exist for modifying the calling number information (calling line number and connected line number): the new format-dependent station number modification (AMOs KNFOR, KNPRE and TDCSU) and the 'old' source/destination-dependent method as administered with the KNMAT AMO. Hicom 300 E V1.0 nodes with the ISDN numbering plan (NPI=ISDN) should always use the format-dependent method. To this end, the ISDN exchange must be assigned a virtual node number in order to be able to configure the outgoing trunk groups for routing (DNNO parameter of RICHT AMO) and incoming trunk groups for identification (NNO parameter of TDCSU AMO). The own node number must always be entered in the central PABX data administered with the ZAND AMO (parameter NNO). The virtual node number must have the same hierarchical level structure (i.e. single-level, 2-level or 3-level) as the NNO specified in the ZAND AMO.

5.13.2.1 Format-dependent INS/STNO Modification in Incoming Direction

The conversion of the calling number information from an explicit format into an implicit one is carried out in two steps:

Step 1:

The incoming ISDN number (NPI=ISDN), which may be any type of number (TON), is set to the lowest possible format (TON=UNKNOWN) with the aid of the ISDN codes stored in the system (ISDNAC, ISDNCC and ISDNLC parameters of TDCSU AMO). Since this conversion also takes place in transit nodes, these codes must also be assigned to tie-lines with the TDCSU AMO, if these are used to transport numbers of the ISDN numbering plan. If you do not want user displays to show the converted numbers in the lowest possible format, you can set an alternative format with the KNFOR AMO.

Step 2:

Depending on the type of number (TON), the modified (shortened) ISDN call number (see step 1) is then supplemented with the national prefix (TON=NATIONAL) and international prefix (TON=INTERNAT) as well as the breakout code (only if TON is not equal to UNKNOWN). The following AMO settings are necessary for this:

- Define the breakout codes in all network nodes, and prefix codes specific to the home node, with the KNPRE AMO, as follows:
  `ADD-KNPRE:DPLN=0,NPI=ISDN,TON=INTERNAT,EXIT=0,PREFIX=00;`

  `ADD-KNPRE:DPLN=0,NPI=ISDN,TON=NATIONAL,EXIT=0,PREFIX=0;`

```
ADD-KNPRE:DPLN=0,NPI=ISDN,TON=SUBSCR,EXIT=0;
```

Since EURO-ISDN exchanges always transport the calling number information in the explicit format defined by ETSI-E.164, the prefix settings in the TDCSU AMO are not required (ISDNIP and ISDNNP).

5.13.2.2 Format-dependent INS/STNO Modification in Outgoing Direction

The conversion of the calling number information from an implicit format into an explicit one is also carried out in two steps:

Step 1:

With the aid of the KNPRE settings, any breakout codes or prefixes contained in the implicit number are removed.

Step 2:

The modified/shortened number is then set to the highest format (TON=INTERNAT) on the basis of the ISDN code settings in the TDCSU AMO. If a destination node in the network, or the ISDN exchange, requires a lower format, this can be set with the aid of the KNFOR AMO, in cases where this is possible.

5.13.2.3 COT-Parameters

Since the ISDN exchange cannot recognize node codes, the COT attribute LWNC (line without node code) must be set for the eschange line.

- Add attribute to class of trunk of ISDN exchange line:
  `CHANGE-COT:COTNO=NUMBER,COTTYPE=COTADD,COTPPAR=LWNC;`

  The COT parameter DFNN (use virtual node number assigned to line) does not need to be specified, since this function is automatically carried out by the system for exchange lines. The COT parameter LIRU (line with implicit number) is only significant in heterogeneous networks (see "INS Info-Number Signalling" chapter of AMO Usage Examples for Networking). This attribute must always be set for tie-lines to "old" systems and OEM systems, together with the appropriate KNFOR settings for the ISDN exchange interfaces in these systems.

  IMPORTANT: COT parameter LWNC only works in the outgoing direction, and parameter DFNN only works in the incoming direction. COT parameter LIRU works in both directions.

5.13.2.4 Handling of extension numbers unknown to the exchange

The sending of extension numbers unknown to the ISDN exchange should be avoided. In such a case a substitute number (e.g. the attentand console number) is sent to the exchange. Configure the substitute extension number

using KNMAT AMO with the modification condition ERSNST (Substitute extension number).

```
CHANGE-KNMAT:NPI=ISDN, LEVEL=0, ONNO=<OpenScape 4000
 node>,
DNNO=<Trunk node>, MODCON=REPEXT, NUMEXT=<substitute
 extension number>;
```

Assign the class of service DIDBLK to all stations unknown to the exchange (e.g. all extension numbers beginning with 4):

```
CHANGE-COSSU:TYPE=COS, COS=14, AVCE=DIDBLK;

CHANGE-SCSU:STNO=4000&&4999, COS1=14, COS2=14;
```

If, for example, the substitute extension number (number of the attendant console) is 722 1111 the extension number 4711 is substituted by

- the substitute number 722 1111 (COS DIDBLK is set)

while extension number 5711

- is substituted by 722 5711 (COS DIDBLK is not set). The rule to use the substitute extension number also applies here, however, the last four digits 1111 are overwritten by 5711.

5.13.2.5 Classes of service OVCAT and SPECAR

There are two classes of service for CLIP and COLP (per service).

- OVCAT : Override category The number of the called/calling party is displayed at the called/calling party in spite of a "secret number" classmarking (this only applies to functional terminals).
- SPECAR: Special arrangement When a functional terminal sends its own call number to the system, the plausibility of this number is not checked (this applies to both directions of seizure).

5.14 Features Available Throughout the Network

5.14.1 Call Forward/Forward No Reply

Call forwarding is possible throughout a private network (to other stations, servers or code-calling systems), and even to public network subscribers. Call forwarding cannot be enabled for the ISDN main station lines of a PABX. Call forwarding to public network subscribers is possible with the following restrictions: VOICE service only, only for privileged users (special COS), and number of dialled external digits must not exceed 22

- For call forwarding and forwarding on no answer throughout the network the AMO COT has two values: FWDN and FNAN respectively.
  `ADD-COT:COTNO=number,PAR=FWDN&FNAN;`

IMPORTANT: Forward no reply only for S0 / S2 circuits.

- Assign call forwarding to public network for voice service
  `ADD-COSSU:NEWCOS=number,AVCE=FWDNWK;`

5.14.1.1 Call Forward/Forward No Reply with Open Numbering Scheme

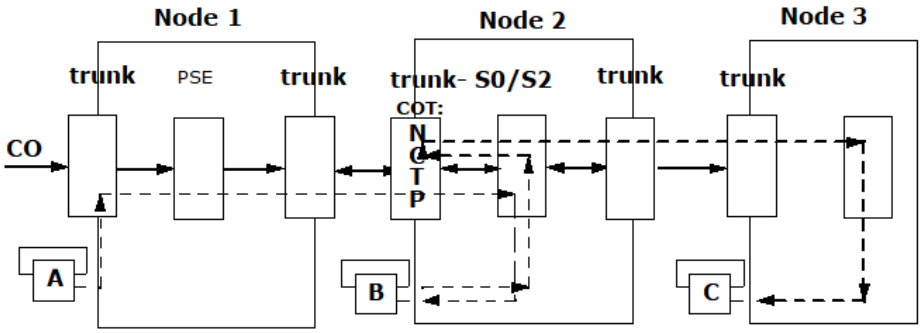
If call forwarding or no answer advance is activated at the called party's station, and the call is forwarded back to the caller's home node, the route code prefix must be suppressed. Enter route code of home node to be suppressed in the DPLN (DESTNO=1)
`AD-WABE:CD=90,DAR=OWNNODE;`

5.14.1.2 Call Forward/Forward No Reply after Transfer

If the partner cannot execute network-wide FWD/FNANS after transfer, this feature must be prevented by setting the COT parameter **NCTP** in the S0/S2 trunk to this PBX.
`CHA-COT:COTNO=number, COTTYPE=COTADD, PAR=NCTP;`

Example:

Station A (Node 1) transfers a call to station B (Node 2) which has set FWD/FNANS to station C (Node 3): The connection is to station C is therefore established by Node 2 and not Node 1.



5.14.2 Announcement Unit

Announcement unit for a node without exchange trunks

Seizure from all nodes is possible.

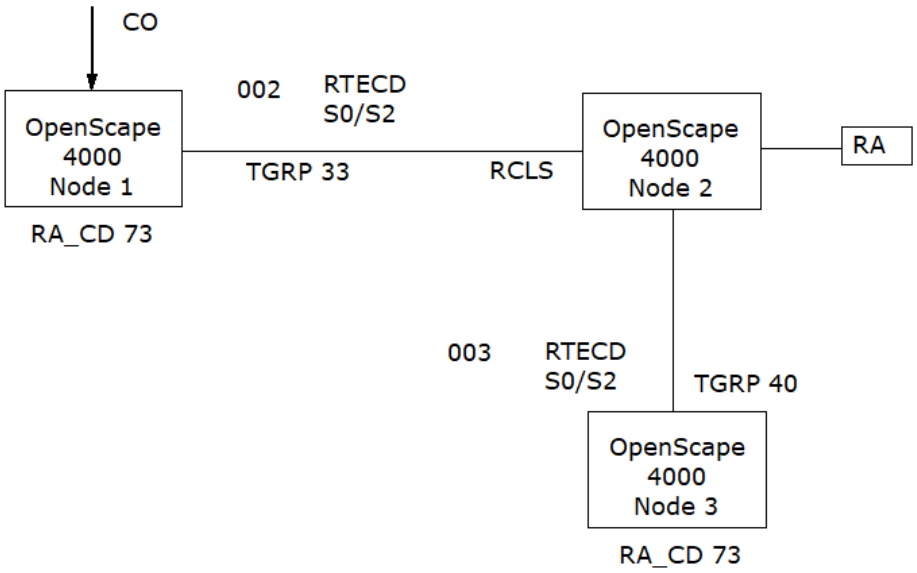


Figure 22: Announcement unit throughout the network, also via CO

For station users who want to access the announcement unit via incoming calls from the exchange, the announcement code must be additionally assigned for the "SAT" DAR in the DPLN (of the node with the trunks). For external stations, the route to the announcement unit must be formed with the announcement unit code, the CPS 3&6 and the same group as for internal announcement.

In the COT of the S2 circuits, with which the node with the announcement unit is seized via the exchange, the RCLS parameter must be set. Thus, CPS=6 (incoming trunk) is generated for the CO seizure type, which is required for controlling the TCOM (first greeting text, then announcement text).

- Commands in node 1 (for example in above diagram)
  - Assign the code for DAR=NETRTE as follows:
    `AD-WABE:CO=002,DAR=NETRTE;`
  - Assign announcement code for external stations
    `AD-WABE:CD=73,DAR=SAT;`
  - Assign announcement code for internal stations
    `AD-WABE:CD=73,CPS=2&4&5&7&8&9&10&11&12,DAR=NETW;`
  - Assign route for announcement code of internal stations to node 2
    `AD-RICHT:TYPE=CD,CD=002,CPS=0,SVC=ALL,TGRP1=33;`
  - Assign route for announcement code of external stations to node 2
    `AD-RICHT:TYPE=CD, CD=73, CPS=3&6, SVC=ALL, TGRP1=33, PREFDGT1=73;`
- Commands in node 2
  - Assign announcement codes for internal and external stations
    `AD-WABE:CD=73,DAR=ANSCO;`
    `AD-WABE:CD=73,DAR=ANSINT;`

- Commands in node 3
  - Assign code for DAR=NETRTE
    ```
    AB-WABE:CD=003,DAR=NETRTE;
    ```
  - Assign announcement code for internal stations
    ```
    AD-WABE:CD=73,DAR=NETW;
    ```
  - Assign route with DAR=NETRTE to node 2
    ```
    AD-RICHT:TYPE=CD, CD=003, CPS=0, SVC=ALL, TGRP1=40;
    ```

Announcement unit for a node with exchange trunks

If the node with the TCOM also provides trunks, which are to be used by the other nodes as well, with the same exchange code, proceed as follows since the digit analysis result CO cannot be allocated CPS=6.

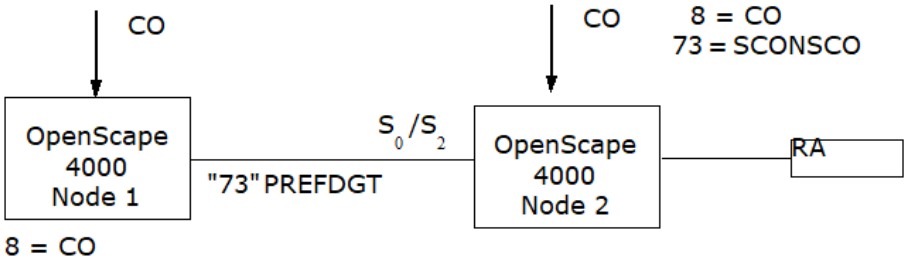


Figure 23: Node with announcement unit and exchange trunks

In node 1, the exchange code of node 2 must lead to DAR CO, for example, and be linked with the tie-trunk group; conversion to another code, e.g. 73, must be performed. Conversion is done via digit prefixing with the RICHT AMO.

- Commands in node 1

  ```
  AD-WABE:CD=8, DAR=CO;

  AD-RICHT:TYPE=CD, CD=8, SVC=ALL, TGRP1=number,
   PREFDGT1=73;
  ```

  In node 2 code 73 leads to the SAT digit analysis result and is linked with the trunk group.
- Commands in node 2

  ```
  AD-WABE:CD=8, DAR=CO;
  AD-WABE:CD=73, DAR=SAT;
  AD-RICHT:TYPE=CD, CD=8, SVC=ALL, TGRP1=number, CPAR=CO;
  AD-RICHT:TYPE=CD,CD=73, SVC=ALL, TGRP1=number, CPAR=CO;
  ```

  This generates a second exchange code which is not apparent to the user.

5.14.3 Override, Camp-On, Transfer

The following parameters must be set in the COT so that the features override/ camp-on, transfer (S0/S2) can be used throughout the network:

KNOR -	override/camp on possible at busy station
CEBC -	transfer (busy/ring or talk state)

CEOC -	transfer (only talk state)

These line parameters must be coordinated with the remote system.
`AD-COT:COTNO=number,PAR=param`

5.14.4 Public Address System

Seizure from all nodes is possible. In the other nodes, the code must lead to DAR=NETW with the destination number indication. Announcement via the CO is not provided.

5.14.5 Dictation Equipment

The dictation equipment can be used throughout the network, also via incoming calls from the exchange. Command for all nodes in which DICT is not configured.
`AD-WABE:CD=key-num,DAR=NETW,DESTNO=number;`

5.14.6 Door Opener

The entrance call feature can be used throughout the network. The door opener function can be used by suffix-dialling via the dial plan of the system in which the door opener circuit is configured. Suffix dialling is only possible via an S0/S2 connection (OpenScape 4000/HiPath 4000 - OpenScape 4000/HiPath 4000) or via loop signalling with DP devices.

The access code of the entrance telephone in the foreign node may be identical to the suffix dialling digits, and must be assigned the "NETW" DAR.

5.14.7 Code Calling - Normal and Multiple Task

The code calling system (CC or CCM) is accessible throughout the network. Normal network code calling is only possible with closed numbering schemes, CCM is also possible with open numbering plans. CCM can also be used for incoming calls from the exchange.

The MEET-ME function (Waiting before answering) can be used throughout the network by PSE/PSM. Network-wide call forwarding/ring no answer to a PSM MEET-ME is possible. With direct incoming calls from the exchange the required station is called in addition to the PSM (parallel call), if CF/RNA is configured and if the PSM and the forwarding station are located in the same node. Answering via analog and tie trunks is not possible. The attendant console cannot answer. Switching to PS in other nodes is possible if the waiting station is in a different node. Switching is not possible, if the PS and the waiting station share the same node and consultation hold on the same line was carried out.

For the DISPLAY mode, it is necessary that the A-block number also be transferred. Therefore, this function is only possible via S0 and S2 in inter-PBX transit traffic. (For CCM, DISPLAY can also be used for incoming calls from the exchange with S0 and S2 with CorNet-N or CorNet-NQ protocol.)

Assign the CC in the node in which it is configured, as before.

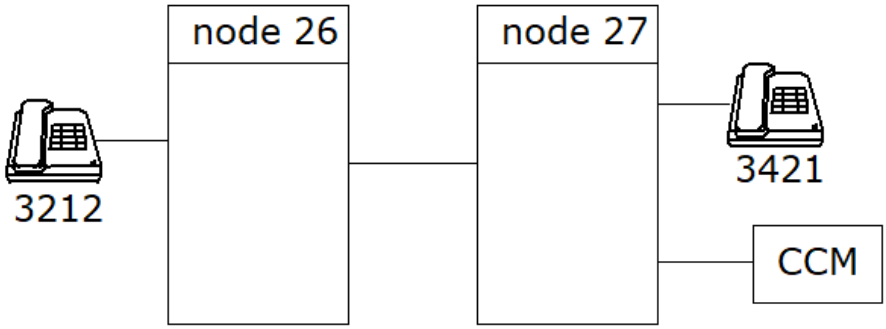
In all other nodes, from which paging jobs are to be executable, the paging code CCSN, CCSCD and CCANS or CCMS, CCMSURG and CCMANS is assigned on DAR=NETW plus destination number.

- Set the system-specific parameters for the CCM in all systems with AMO ZAND.

```
CHA-ZAND:TYPE=CCM, STNRNG=param, SRCHTN=param,
 DEL=param, POSTDBSY=param,
SRCHONCE=param, ANNINTCC=param, ANNEXTCC=param,
 AAFTERB=param, ADISPEND=param,
SYNCACCM=param, OPENNO=param;
```

PSM in networks with open numbering plans

In networks with open or mixed numbering plans all search codes, together with the node code, are signaled to the CCM, e.g. 263212 if 26-3212 is searched and 273421 if 3421 is searched



If the CCM is called directly (=prefix), the called number must be terminated by '#'.[11] The own node code is not required for searching for stations within the system where the CCM is located.

Programming Call forwarding to CCM remains the same: forwarding destination = paging code.

- Activate the CCM for open numbering plans:
  `CHA-ZAND:TYPE=CCM, OPENNO=YES;`
- The station numbers must be known to the OpenScape 4000, dialed number - to pager number conversion is not possible:
  `CHA-TSCSU:PEN=<ltg-ltu-slot-cct>, DEV=CCM, STNOLEN=0, CONV=NO;`
- Enter the routing code of the home node (corr. WABE code OWNNODE) in every PBX:
  `CHA-ZAND:TYPE=ALLDATA, PNODECD=<ownnode>;`
- Program call forwarding to CCM for stations in a network:

```
ADD-ZIEL:TYPE=FWD, SRCNO=<number>, SI=VOICE,
 DESTNOF=<key-num>,
```

[11] If the function "PSM with open numbering plan" is active, then this is always applicable, even with closed numbering.,

```
DTYPE=<diversion type>, CFVAR=<call forwarding variant>;
```

where key-num= paging code+ ownnode+station number

5.14.8 Callback

Callback if busy between station users of a private network Callback if busy from and to public ISDN users Callback on no answer between users in a private network (not VFSS)

- The parameter CBK must be declared in the AMO DIMSU
  `AD-DIMSU:TYPE=USER,CBK=number;`
- For callback throughout the network the AMO COT has two parameters: CBBN for callback if busy, and CCFN for callback on no answer.
  `AD-COT:COTNO=number,PAR=CBBN;`

  `AD-COT:COTNO=number,PAR=CBFN;`

IMPORTANT: Line circuits must be hard-blocked, since the Call References are not deleted with a soft block, and the circuit only becomes free when all its callback jobs have been processed.

IMPORTANT: Der COT parameter **TSCS** is to be set on all digital circuits (tie/public).

5.14.9 Speed Dialling Facility Throughout the Network (S0,S2)

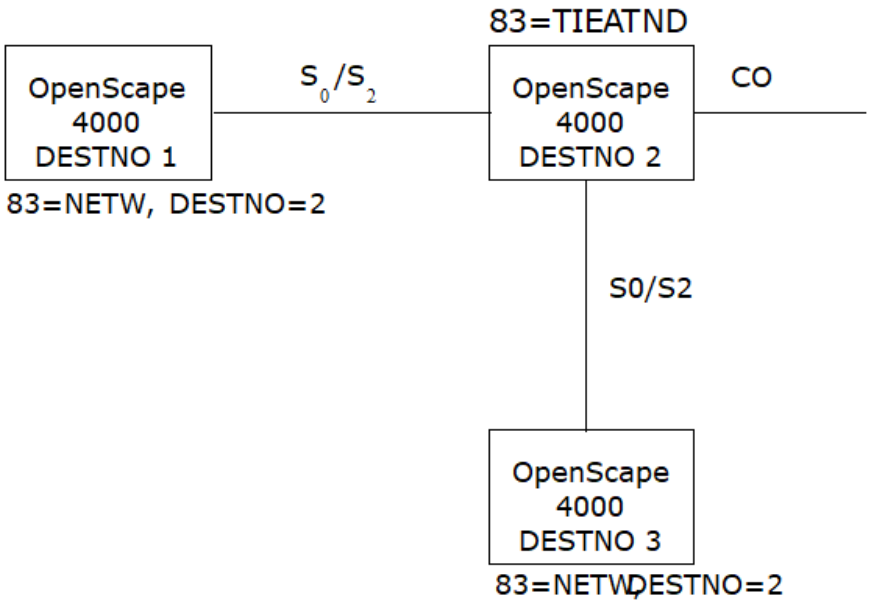


Figure 24: Example for using the speed dialling facility in the EMS

The speed dialling facility can be used throughout the network. Within a OpenScape 4000 network linked with S0/S2 the speed dialling facility code leads to DAR=NETW in all "foreign" nodes.

5.15 ISDN Protocol Variants

The initialization for the PD tables has been transferred from the database to the HD. The following command is sufficient for initialization of the memories for the PD tables:

```
COPY-PRODE:PVCD,1;
```

The above command writes the initialization data for the PD tables to the database, initializes the general section and loads all assigned PDs.

The protocol descriptor tables consists of a general section and the PD tables. This applies both to the database (DB) and the hard disk (HD)

The general section is referred to as the variant table (VARTAB). It defines the relationships between the protocol descriptors (PD) and the protocol variants.

The hard disk contains up to 40 versions of these variant tables, each for a particular country. On the HD the tables are termed protocol variant combination descriptors (PVCD).

The PVCDs and PDs on the hard disk can be displayed with the following commands:

```
DISPLAY-PRODE:SRC=HD,KIND=PVCDSHRT;

DISPLAY-PRODE:SRC=HD,KIND=PDSHORT;
```

Outputs, see AMO description.

The PVCDs/PDs are numbered for HD access and are addressed by means of PVCDNR or PDNR.

The database protocols activated can be displayed with the following commands:

```
DISPLAY-PRODE:SRC=DB,KIND=PDSHORT;

DISPLAY-PRODE:SRC=DB,KIND=VARTAB;
```

Outputs, see AMO description.

5.15.1 Notes on protocol handling

With the COPY action, a complete protocol variant combination descriptor (PVCD) or an individual protocol descriptor (PD) can be loaded from the hard disk.

When a PVCD is copied, the variant table (VARTAB) is initialized in the DB and all the PDs required for the PVCD are loaded.

A maximum of 14 PDs can be used in a PVCD. The loaded PDs are activated automatically.

When individual PDs are copied, either an already loaded PD can be overwritten or a free space can be searched or specified for the PD. Once an individual PD has been loaded, it is deactivated.

After an individual PD has been copied, the CHANGE command for activation of the PD must be sent in order to ensure that the active bit is set and the call processing (CP) protocol is available. The command to activate the PD is:
`CHANGE-PRODE:SRC=PD,PDNAME=PD08,SEC=ORG,ACTIVE=Y;`

With the CHANGE action, the contents of the PD memories can be changed in both the general section (VARTAB) and the individual protocol descriptors (PD). A PD can also be activated/deactivated.

Only a PD loaded with COPY can be changed.

To prevent call processing from accessing inconsistent data when a PD (protocol file) is changed, the PD is disabled automatically with the first CHANGE command. The PD must be reactivated explicitly with the last CHANGE command (parameter ACTIVE).

5.15.2 Notes for upgrading a previous version

The protocol variants 1TR6 or DKZN and SBQ9311 are no longer available.

The protocol variant ECMABC is generally no longer available. Use the protocol variant ECMA1 instead.

5.15.3 Example: Copying a protocol from the hard disk to the database

5.15.3.1 Current PRODE configuration should be regenerated first.

The result can be reloaded in an emergency to regenerate the previous status.
`REG-PRODE;`

5.15.3.2 Displaying the assignment of protocol variants to the protocols loaded in the database:

PROTVAR	Name of protocol variant assigned to trunks or stations
PDNAME	Database memory location (PD01 - PD14) containing a protocol
PDSTRING	Short description of the protocol

Check which protocol variants (PROTVAR) are not needed and can be deleted. A memory location (PDNAME) can be assigned to multiple protocol variants (PROTVAR).

In the following example:

- PD01, PD02 are assigned to the protocol variant (PROTVAR) CORNV33.
- PD07 is assigned to PROTVAR SBDSS1 (with option table 10).

`DIS-PRODE:SRC=DB,KIND=VARTAB;`

```
H500:  AMO PRODE STARTED
 PVCDNR :  1 "DEUTSCHLAND              " VERSION: B0-
EL0.20.001

+---------------------+--------+--------
+---------------------------+

| PROTVAR             |        | PDNAME | PDSTRING
         |

+---------------------+--------+--------
+---------------------------+

| CORNV33             | PDNORM |  PD01  | CORNET-N 1.3f
 (IM)        |

|                     | PDA1   |  PD02  | NI-2 PRI
 MAINTENANCE      |

|                     | PDA2   |        |
         |

+---------------------+--------+--------
+---------------------------+

| ECMA1               | PDNORM |  PD03  | ECMA QSIG SS
         |

|                     | PDA1   |        |
         |

|                     | PDA2   |        |
         |

+---------------------+--------+--------
+---------------------------+

| EDSBRD              | PDNORM |  PD04  | EURO-ISDN 1TR67
 REF-T     |

|                     | PDA1   |        |
         |

|                     | PDA2   |        |
         |

+---------------------+--------+--------
+---------------------------+

PVCDNR :  1 "DEUTSCHLAND              " VERSION: B0-
EL0.20.001

+---------------------+--------+--------
+---------------------------+
```

```
| PROTVAR              |        | PDNAME | PDSTRING
         |

+--------------------+--------+--------
+--------------------------+

| ETSI                 | PDNORM |  PD05  | EURO-ISDN REF-T
 USER-SIDE |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+--------------------+--------+--------
+--------------------------+

| EDSS1NET             | PDNORM |  PD06  | EURO-ISDN REF-T
 NET-SIDE  |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+--------------------+--------+--------
+--------------------------+

| SBQ9311              | PDNORM |  PD07  | S0-BUS DSS1 ETS
 300 403 ) |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+--------------------+--------+--------
+--------------------------+

PVCDNR :  1 "DEUTSCHLAND              " VERSION: B0-
EL0.20.001

+--------------------+--------+--------
+--------------------------+

| PROTVAR              |        | PDNAME | PDSTRING
         |

+--------------------+--------+--------
+--------------------------+

| SBDSS1               | PDNORM |  PD07  | S0-BUS DSS1 ETS
 300 403 ) |
```

```
|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+---------------------+--------+--------
+--------------------------+

| ECMAV2               | PDNORM |  PD08  | ETSI QSIG Third
 ed. SS    |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+---------------------+--------+--------
+--------------------------+

| PSS1V2               | PDNORM |  PD09  | ISO QSIG Second
 ed. SS    |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+---------------------+--------+--------
+--------------------------+

PVCDNR :  1 "DEUTSCHLAND              " VERSION: B0-
EL0.20.001

+---------------------+--------+--------
+--------------------------+

| PROTVAR              |        | PDNAME | PDSTRING
         |

+---------------------+--------+--------
+--------------------------+

| ATT4ESS              | PDNORM |  PD12  | AT&T 4ESS
 (TR41459)       |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |
```

```
+--------------------+--------+--------
+-------------------------+

| MCI250             | PDNORM |  PD13  | MCI
 014-0018-04.3D-ER     |

|                    | PDA1   |        |
         |

|                    | PDA2   |        |
         |

+--------------------+--------+--------
+-------------------------+

| MCI600             | PDNORM |  PD13  | MCI
 014-0018-04.3D-ER     |

|                    | PDA1   |        |
         |

|                    | PDA2   |        |
         |

+--------------------+--------+--------
+-------------------------+

PVCDNR :  1 "DEUTSCHLAND              " VERSION: B0-
EL0.20.001

+--------------------+--------+--------
+-------------------------+

| PROTVAR            |        | PDNAME | PDSTRING
         |

+--------------------+--------+--------
+-------------------------+

| SPRINT             | PDNORM |  PD13  | MCI
 014-0018-04.3D-ER     |

|                    | PDA1   |        |
         |

|                    | PDA2   |        |
         |

+--------------------+--------+--------
+-------------------------+

| NI2                | PDNORM |  PD11  | NI-2 PRI
 (SR-4619)        |

|                    | PDA1   |        |
         |
```

```
|                      | PDA2   |        |
         |

+--------------------+--------+--------
+-------------------------+

| CORNUS               | PDNORM |  PD14  | CORNET-N 1.3f
 (US)        |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+--------------------+--------+--------
+-------------------------+

AMO-PRODE-124       TABELLEN FUER DEN PROTOKOLL DESCRIPTOR
 VERWALTEN

ABFRAGEN DURCHGEFUEHRT;
```

IMPORTANT: Before loading a new protocol to a memory location (PDNAME), ensure that this memory location is not assigned to any protocol variant (PROTVAR).

5.15.3.3 Deleting unwanted protocol variants

IMPORTANT: The AMO PRODE does not check if a protocol variant is still assigned to a trunk or a station. It may be necessary to regenerate the AMO TDCSU or SBCSU and then analyze the regeneration result to check if a protocol variant is still in use.

In this example, a change command is used to delete the protocol variants SBDKZ1 and SBDKZ2 from VARTAB (DB). The new protocol is loaded to memory location PDNAME=10.

Protocol variant MCI250 is deleted:

```
CHA-PRODE:SRC=VARTAB,PROTVAR=MCI250;
```

Check query:

```
DIS-PRODE:SRC=DB,KIND=VARTAB
```

PROTVAR MCI250 has been deleted, memory location PD10 is no longer assigned to a PROTVAR.

5.15.3.4 Querying the number (PDNO) under which the required protocol description (PDSTRING) is saved on the HD

In this example, the MCI 014-0018-04 MAINT protocol is loaded to the database.

```
DIS-PRODE:SRC=HD,KIND=PDSHORT;
    +------+---------------------------+-------
+---------------+

   | PDNR | PDSTRING                   | IDENT | VERSION
    |

   +------+---------------------------+-------
+---------------+

   |  1   | ECMA QSIG BC               | H/08  | B0-
EJ0.20.002 |

   |  2   | SWISSNET 2 BC              | H/08  | B0-
EG0.10.001 |

   |  3   | CORNET HICOM V2.2 / V2.3   | H/08  | B0-
EL0.20.001 |

   |  4   | CORNET-N 1.3f (IM)         | H/08  | B0-
EL0.20.004 |

   |  5   | 1TR6 N0 REF-T (USER-SIDE)  | H/40  | B0-
EL0.20.001 |

   |  6   | 1TR6 N1 REF-T (USER-SIDE)  | H/41  | B0-
EL0.20.001 |

   |  7   | ANALOG                     | H/11  | B0-
EL0.20.001 |

   |  8   | FRANKREICH VN3 NUMERIS     | H/08  | B0-
EL0.10.001 |

   |  9   | S0-BUS DSS1 ETS 300 403 )  | H/08  | B0-
EJ0.20.001 |

   |  10  | S0-BUS DKZN1 N0            | H/40  | B0-
EL0.20.002 |

   |  11  | S0-BUS 1TR6  N0            | H/40  | B0-
EL0.20.001 |

   |  12  | S0-BUS DKZN1 N1            | H/41  | B0-
EL0.20.002 |

   |  13  | S0-BUS 1TR6  N1            | H/41  | B0-
EL0.20.001 |
```

```
   |  14  | EURO-ISDN REF-T USER-SIDE | H/08  | B0-
EJ0.20.004 |

   |  15  | EXPO-92 SPANIEN JULIO, 89 | H/08  | B0-
EG0.10.002 |

   |  16  | PRE-EURO-ISDN FINNLAND    | H/08  | B0-
EG0.10.001 |

   +------+---------------------------+-------
+---------------+

   | PDNR | PDSTRING                  | IDENT | VERSION
    |

   +------+---------------------------+-------
+---------------+

   |  17  | PRE-EURO-ISDN PORTUGAL    | H/08  | B0-
EG0.10.001 |

   |  18  | PRE-EURO-ISDN BELGIEN     | H/08  | B0-
EG0.10.001 |

   |  19  | PRE-EURO-ISDN DAENEMARK   | H/08  | B0-
EG0.10.001 |

   |  20  | 1TR6 N1 REF-Q (NET-SIDE)  | H/41  | B0-
EL0.20.001 |

   |  21  | EURO-ISDN 1TR67 REF-T     | H/08  | B0-
EJ0.20.004 |

   |  22  | EURO-ISDN OESTERREICH     | H/08  | B0-
EJ0.20.004 |

   |  23  | FRANKREICH VN4 NUMERIS    | H/08  | B0-
EJ0.20.001 |

   |  24  | NEDERLAND                 | H/08  | B0-
EG0.10.001 |

   |  25  | CHINA CSN-7 REF-T         | H/08  | B0-
EH0.10.006 |

   |  26  | ENGLAND  MCL-ISDN         | H/08  | B0-
EF0.30.004 |

   |  27  | BASIC ACCESS T0 AUSTRALIA | H/08  | B0-
EF0.30.002 |

   |  28  | PRIM. ACCESS T2 AUSTRALIA | H/08  | B0-
EF0.30.002 |

   |  29  | ECMA QSIG SS              | H/08  | B0-
EL0.20.001 |
```

```
   |  31  | ETSI QSIG Third ed. SS    | H/08  | B0-
EL0.20.001 |

   |  32  | ISO QSIG Second ed. SS    | H/08  | B0-
EL0.20.001 |

   +------+---------------------------+-------
+---------------+

   | PDNR | PDSTRING                  | IDENT | VERSION
    |

   +------+---------------------------+-------
+---------------+

   |  33  | EURO-ISDN REF-T NET-SIDE  | H/08  | B0-
EJ0.20.004 |

   |  34  | NI-2 PRI (SR-4619)        | H/08  | B0-
EN0.10.002 |

   |  35  | NI-2 PRI (SR-4619 (NET)   | H/08  | B0-
EN0.10.002 |

   |  36  | NI-2 PRI MAINTENANCE      | H/43  | B0-
EL0.20.002 |

   |  37  | AT&T 4ESS (TR41459)       | H/08  | B0-
EL0.20.007 |

   |  38  | AT&T 4ESS (TR41459) MAINT | H/03  | B0-
EL0.20.002 |

   |  39  | MCI DMS 250 014-0018-04   | H/08  | B0-
EL0.20.009 |

   |  40  | CORNET-N 1.3f (US)        | H/08  | B0-
EL0.20.005 |

   |  41  | S0-BUS NI-BRI GR-268-CORE | H/08  | B0-
EL0.20.005 |

   |  42  | MCI 014-0018-04 MAINT     | H/03  | B0-
EL0.20.001 |

   |  43  | MCI DEX 600 014-0018-04   | H/08  | B0-
EL0.20.004 |

   +------+---------------------------+-------
+---------------+

AMO-PRODE-60        TABELLEN FUER DEN PROTOKOLL DESCRIPTOR
 VERWALTEN
 ABFRAGEN DURCHGEFUEHRT;
```

The required protocol is stored under number 42 on the hard disk.

5.15.3.5 Copying the protocol from the hard disk to the database memory

Protocol no. 42 is copied to memory location PD10 in the database.
```
COPY-PRODE:TYPE=PD,PDNO=42,PDNAME=PD10;
```

5.15.3.6 Assigning a protocol variant to the memory location in the database

The protocol variant MCI250 should be assigned to memory location PD10.
```
CHA-PRODE:KIND=VARTAB, PROTVAR=MCI250, PDNORM=PD10;
```

This procedure must be repeated if the protocol loaded is assigned to more than one protocol variant.

Check query:
```
AB-PRODE:ORT=DB,ART=VARTAB;

H500:  AMO PRODE GESTARTET
 PVCDNR :  1 "DEUTSCHLAND              " VERSION: B0-
EL0.20.001

+--------------------+--------+--------
+--------------------------+

| PROTVAR             |        | PDNAME | PDSTRING
         |

+--------------------+--------+--------
+--------------------------+

| CORNV33             | PDNORM |  PD01  | CORNET-N 1.3f
 (IM)        |

|                     | PDA1   |  PD02  | NI-2 PRI
 MAINTENANCE      |

|                     | PDA2   |        |
         |

+--------------------+--------+--------
+--------------------------+

| ECMA1               | PDNORM |  PD03  | ECMA QSIG SS
         |

|                     | PDA1   |        |
         |

|                     | PDA2   |        |
         |

+--------------------+--------+--------
+--------------------------+
```

```
| EDSBRD               | PDNORM |  PD04  | EURO-ISDN 1TR67
 REF-T     |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+--------------------+--------+--------
+--------------------------+

PVCDNR :  1 "DEUTSCHLAND              " VERSION: B0-
EL0.20.001

+--------------------+--------+--------
+--------------------------+

| PROTVAR              |        | PDNAME | PDSTRING
         |

+--------------------+--------+--------
+--------------------------+

| ETSI                 | PDNORM |  PD05  | EURO-ISDN REF-T
 USER-SIDE |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+--------------------+--------+--------
+--------------------------+

| EDSS1NET             | PDNORM |  PD06  | EURO-ISDN REF-T
 NET-SIDE  |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+--------------------+--------+--------
+--------------------------+

| SBQ9311              | PDNORM |  PD07  | S0-BUS DSS1 ETS
 300 403 ) |

|                      | PDA1   |        |
         |
```

```
|                      | PDA2   |        |
         |

+--------------------+--------+--------
+--------------------------+

PVCDNR :  1 "DEUTSCHLAND              " VERSION: B0-
EL0.20.001

+--------------------+--------+--------
+--------------------------+

| PROTVAR             |        | PDNAME | PDSTRING
         |

+--------------------+--------+--------
+--------------------------+

| SBDSS1              | PDNORM |  PD07  | S0-BUS DSS1 ETS
 300 403 ) |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+--------------------+--------+--------
+--------------------------+

| ECMAV2              | PDNORM |  PD08  | ETSI QSIG Third
 ed. SS    |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+--------------------+--------+--------
+--------------------------+

| PSS1V2              | PDNORM |  PD09  | ISO QSIG Second
 ed. SS    |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+--------------------+--------+--------
+--------------------------+

| MCI250              | PDNORM |  PD10  | MCI 014-0018-04
 MAINT     |
```

```
|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+---------------------+--------+--------
+--------------------------+

PVCDNR :  1 "DEUTSCHLAND              " VERSION: B0-
EL0.20.001

+---------------------+--------+--------
+--------------------------+

| PROTVAR             |        | PDNAME | PDSTRING
         |

+---------------------+--------+--------
+--------------------------+

| ATT4ESS             | PDNORM |  PD12  | AT&T 4ESS
 (TR41459)       |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+---------------------+--------+--------
+--------------------------+

| MCI600              | PDNORM |  PD13  | MCI
 014-0018-04.3D-ER     |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+---------------------+--------+--------
+--------------------------+

PVCDNR :  1 "DEUTSCHLAND              " VERSION: B0-
EL0.20.001

+---------------------+--------+--------
+--------------------------+

| PROTVAR             |        | PDNAME | PDSTRING
         |
```

```
+--------------------+--------+--------
+-------------------------+

| SPRINT               | PDNORM |  PD13  | MCI
 014-0018-04.3D-ER     |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+--------------------+--------+--------
+-------------------------+

| NI2                  | PDNORM |  PD11  | NI-2 PRI
 (SR-4619)        |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+--------------------+--------+--------
+-------------------------+

| CORNUS               | PDNORM |  PD14  | CORNET-N 1.3f
 (US)        |

|                      | PDA1   |        |
         |

|                      | PDA2   |        |
         |

+--------------------+--------+--------
+-------------------------+

AMO-PRODE-124       TABELLEN FUER DEN PROTOKOLL DESCRIPTOR
 VERWALTEN

ABFRAGEN DURCHGEFUEHRT;
```

5.16 LCR (Least Cost Routing)

LCR is a collective term for the procedures of routing in a network which allow optimum control of the line selection for a connection under mutual interaction.

This routing is based on the user LCOS, the costs of a circuit, the time of day, the node number, the source group, the restriction table (destination) and the service. The system determines the available routes and checks the authorization of the user for using the route.

5.16.1 Routing with LCR

5.16.1.1 Feature Description

Routing with LCR allows the specification of several alternative routes within a network to the destination station (see diagram).

In this context, the route may display differing properties, e.g. as regards call charge recording.

5.16.1.2 Service Information

- The digits dialed by the subscriber can be manipulated as a function of the route selected (LCR dial rules).
- The search for an idle circuit only takes place once during the call setup. However, a circuit is not seized until after a complete check of the dial plan.
- An additional alternative route can also be added to a route in LCR.
- For the primary path, the route with the shortest/least expensive connection should be established (direct connection).
- **Restriction**: LCR is only operable when the end partners of the standard route are analog/digital stations or analog/digital CO trunk circuits. Functional terminals and analog interface circuits, special equipment (VMX, VMS, paging, etc.) and COs (as A or C stations in consultation) are not supported.

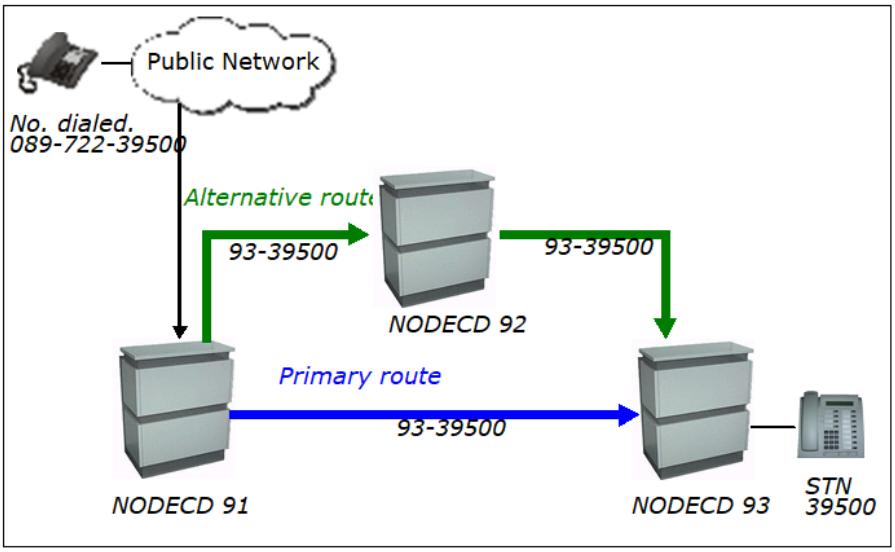


Figure 25: Alternative Routes to Destination Station

5.16.1.3 Generation (Example)

Excerpt of the most important commands for closed numbering from Node 91 to Node 93 with an alternative route via Node 92.

- Prepare route to Node 93 with AMO RICHT:

```
ADD-RICHT:MODE=CD, LRTE=93, CD=093, SVC=ALL, NAME="TO
 NODE 93",
TGRP1=93&92;
```

- Enter primary route (direct connection) in AMO LDAT:
  `ADD-LDAT:LROUTE=93, LSVC=ALL, TGRP=93, ODR=1, LAUTH=1;`
- Enter secondary route (alternative route via NODECD 92) by means of AMO LDAT:
  `ADD-LDAT:LROUTE=93, LSVC=ALL, TGRP=92, ODR=1, LAUTH=1;`

5.16.1.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
RICHT	ART	d	Art der Adressierung der Richtung
	MODE	e	Address-mode of the route
	LRTG	d	LCR - Richtungsnummer
	LRTE	e	LCR - Route number
	KZ	d	Richtungskennzahl
	CD	e	Routing code
	DIENST	d	Dienst
	SVC	e	Communication service
	BUNU1	d	Buendelgruppe 1
	TGRP1	e	Trunk group number 1
LDAT	LRTG	d	LCR-Richtungs Nummer
	LROUTE	e	LCR Route number
	LDIENST	d	LCR Dienst
	LSVC	e	LCR Service indicator
	BUNUM	d	Nummer des Buendels
	TGRP	e	Trunk group number
	LWR	d	LCR - Wahlregel Nummer
	ODR	e	LCR Out dial rule number

5.16.2 Routing with LCR with Rerouting

5.16.2.1 Feature Description

In the case of rerouting, call setup, for instance, is not interrupted upon receipt of a congestion signal from the partner system. Instead, assuming availability, an additional route to the destination is determined and the call setup continued via this route. Route variants already taken into consideration in the specified route within the LCR or routing search are no longer taken into account. By default, every route is assigned the "Rerouting" feature upon setup. However, you can also deactivate this attribute individually for every route via the parameter REROUT in AMO RICHT.

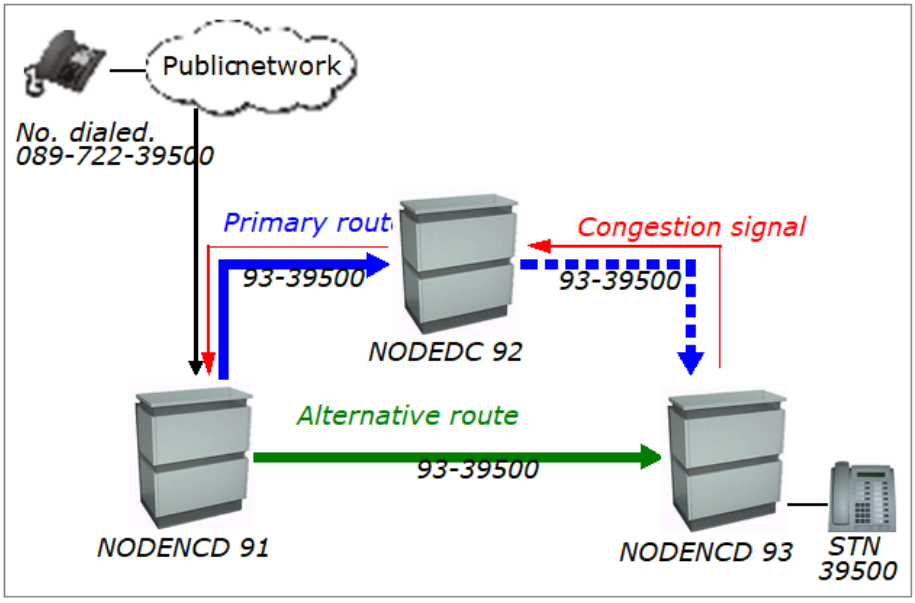


Figure 26: Rerouting

5.16.2.2 Service Information

LCR rerouting is a different feature to Call Forward Rerouting. LCR rerouting (V_CAUSE_ACCEPT_REROUTE) is executed, upon detection of the following situations (Disconnect / Release Causes).

- Cause no. 3: No route to destination (DB_CV_NO_ROUTE_TO_DEST) e.g. No dial plan entry" for the number dialed in the partner system.
- Cause no. 6: Channel unacceptable (DB_CV_CHNL_NOT_ACCEPTABLE) e.g. B-Channel negotiation incorrect.
- Cause no. 8: Unable to render embedded object: File (Proprietary) not found. Outgoing call barred (DB_CV_OUTGONG_CALLS_BARRED) e.g. No LCR authorization for outgoing calls.
- Cause no. 33: Circuit out of order (DB_CV_CIRCUIT_OUT_OF_ORDER) e.g. Circuit fault / Out of operation.
- Cause no. 34: No circuit/channel available (DB_CV_NO_CIRC_CHL_AVAIL) e.g. No valid / Idle circuit available.
- Cause no. 38: Network Out of Order (DB_CV_NETW_OUT_OF_ORDER) e.g. Network fault.
- Cause no. 41: Temporary failure (DB_CV_TEMP_FAILURE) e.g. Insufficient information for call setup in the remote system.

- Cause no. 42: Switching equipment congestion (DB_CV_SWITCH_EQUIP_CONG) e.g. Lack of resources at partner.
- Cause no. 44: Requested circuit/channel not available (DB_CV_RQ_CIRC_CHL_NO_AVAIL).
- Cause no. 47: Resource unavailable (DB_CV_RESOURCE_UNVAIL).
- Cause no. 63: Service or option not available (DB_CV_SERV_OPT_NOT_AVAIL) e.g. Line is available, but does not correspond to the requirements on the connection.
- Cause no. 82: Identified channel does not exist (DB_CV_ID_CHL_DOES_N_EXST) e.g. The channel requested does not exist.
- Cause no. 102: Recovery on timer expiry (DB_CV_REC_TIMER_EXPIRY) e.g. No response within a defined period.
- Cause no. 127: Interworking, unspecified (DB_CV_INTERWORKING).
- Cause no. 140: Unable to render embedded object: File (Proprietary) not found. Network congestion (DB_CV_NETW_CONGESTION).

If the parameter TGRE is set in the COT of a circuit, Rerouting is only performed for causes:

- Cause no. 1: Unallocated (unassigned) number (DB_CV_UNASSIGNED_NR).
- Cause no. 3: No route to destination (DB_CV_NO_ROUTE_TO_DEST).
- Cause no. 22: Number changed (DB_CV_NUMBER_CHANGED).
- Cause no. 44: Requested circuit/channel not available (DB_CV_RQ_CIRC_CHL_NO_AVAIL)

If the parameter TGRE is set in the COT of a circuit with ZANDE OPTFEA 160 active, Rerouting is only performed for causes:

- Cause no. 1: Unallocated (unassigned) number (DB_CV_UNASSIGNED_NR).
- Cause no. 17: User busy (DB_CV_USER_BUSY).
- Cause no. 18: No user responding (DB_CV_NO_USER_RESPONDING).
- Cause no. 21: Call rejected (DB_CV_CALL_REJ).
- Cause no. 31: Normal, unspecified (DB_CV_NORM_UNSPECIFIED).
- Cause no. 41: Temporary failure (DB_CV_TEMP_FAILURE).

5.16.2.3 Generation (Example)

Excerpt of the most important commands for closed numbering from Node 91 to Node 93 with the possibility of Rerouting.

- Add route to Node 93 with AMO RICHT with Rerouting:

```
ADD-RICHT:MODE=CD, LRTE=93, CD=093, SVC=ALL, NAME="TO
 NODE 93",
TGRP1=93&92, REROUT=YES;
```

5.16.2.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
RICHT	ART	d	Art der Adressierung der Richtung
	MODE	e	Address-mode of the route
	LRTG	d	LCR - Richtungsnummer
	LRTE	e	LCR - Route number
	KZ	d	Richtungskennzahl
	CD	e	Routing code
	DIENST	d	Dienst
	SVC	e	Communication service
	BUNU1	d	Buendelgruppe 1
	TGRP1	e	Trunk group number 1
	REROUT	d	Reroute Kennzeichen
	REROUT	E	Set rerout-sign

5.16.3 Routing via LCR with Internal Rerouting

5.16.3.1 Description of Features

In the case of Internal Rerouting, a route is selected within the routes which does not lead to a direct circuit seizure. The LCR remains in the own physical nodes and only transits the dial rule in the route labelled as RERTEINT. With the resultant number, the digit analysis is restarted and the search for a route to the (possibly) new destination commenced, where the "called party number" is internal.

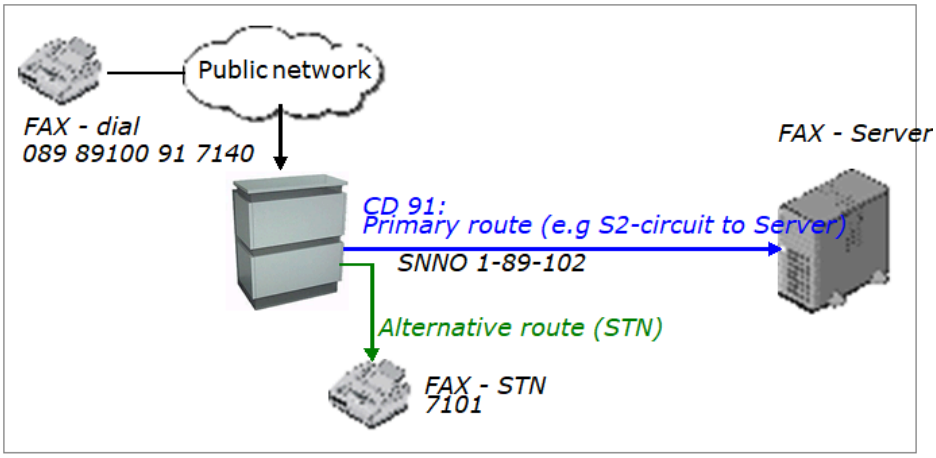


Figure 27: Rerouting Internal

5.16.3.2 Service Information

- For the Internal Reroute function, the parameter REROUT in AMO RICHT need not necessarily be set to the value "Yes".
- No circuit is seized in the case of Internal Rerouting, i.e. the LCR remains within the system.
- The parameter **TGRP** in AMO LDAT should be completed using a TIE Trunk if **LATTR=RERTEINT** is set. The Trunk will not be seized or permissions checked, but a TIE Trunk instead of CO is important for some DB procedures.
- Routing to the own system no longer functions if the own destination node number is specified in the route.
- Incoming channel search for IP Trunking is not supported and does not work when only LDAT entries are available with RERTEINT.

Notes on LATTR=RERTEINT

- **RERTEINT** was developed only to reach an internal destination after dialling a number e.g. the E.164 ISDN CO code for the local switch.
- **RERTEINT** should not be used to reach any external destinations (i.e. the result after RERTEINT should physically belong to the local switch).
- It is coincidental **RERTEINT** is allowed for basic call (i.e. to reach an external destination).

5.16.3.3 Generation (Example)

Excerpt of the most important commands for open numbering to a FAX Server (digit pattern 91-X) with the possibility of Internal Rerouting (rerouting of the FAX to a G3-FAX terminal) if the connection to the FAX server fails.

- Prepare Route 33 to Nodes 1-89-102 with AMO RICHT:

```
ADD-RICHT:MODE=LRTENEW, LRTE=33, LSVC=ALL,
 NAME="FAXSERVER", TGRP=33,
DNNO=1-89-102, INFO="FAXSERVER", PDNNO=1-89-102;
```

- Define Dial Rule No. 33 with AMO LODR:

```
ADD-LODR:ODR=33, CMD=ECHO, FIELD=2;

ADD-LODR:ODR=33, CMD=END;

ADD-LODR:ODR=33, INFO="FAX SERVER";
```

- Define Dial Rule No. 333 with AMO LODR:

```
ADD-LODR:ODR=333, CMD=OUTPULSE, DGTS=7101;

ADD-LODR:ODR=333, CMD=END;

ADD-LODR:ODR=333, INFO="FAX MACHINE";
```

- Prepare direct connection to Nodes 1-89-102 with AMO LDAT:

```
ADD-LDAT:LROUTE=33, LSVC=ALL, LVAL=2, TGRP=33,
ODR=33, LAUTH=1, CARRIER=9, ZONE=EMPTY, LATTR=NONE;
```

- Prepare Internal Rerouting with AMO LDAT (use of a different dial rule and, thus, new entry into route selection):

```
ADD-LDAT:LROUTE=33, LSVC=ALL, LVAL=2, TGRP=33,
ODR=333, LAUTH=1, CARRIER=9, ZONE=EMPTY, LATTR=RERTEINT;
```

5.16.3.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
RICHT	ART	d	Art der Adressierung der Richtung
	MODE	e	Address-mode of the route
	LRTG	d	LCR - Richtungsnummer
	LRTE	e	LCR - Route number
	KZ	d	Richtungskennzahl
	CD	e	Routing code
	DIENST	d	Dienst
	SVC	e	Communication service
	BUNU1	d	Buendelgruppe 1
	TGRP1	e	Trunk group number 1
	REROUT	d	Reroute Kennzeichen
	REROUT	e	Set rerout-sign
LDAT	LRTG	d	LCR-Richtungs Nummer

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	LROUTE	e	LCR Route number
	LDIENST	d	LCR Dienst
	LSVC	e	LCR Service indicator
	BUNUM	d	Nummer des Buendels
	TGRP	e	Trunk group number
	LWR	d	LCR - Wahlregel Nummer
	ODR	e	LCR Out dial rule number
	LATTR	d	LCR-Attribut
	LATTR	e	LCR attribute

5.16.4 Central Office Breakout

Trunk calls are routed to the private node closest to the destination. This is only sensible if the destination is within the local area, or if the short-haul area of a node lies within the private network. Breakout into the public network (CO Breakout) is thus performed at the least expensive point and the use of resources in the private network minimized.

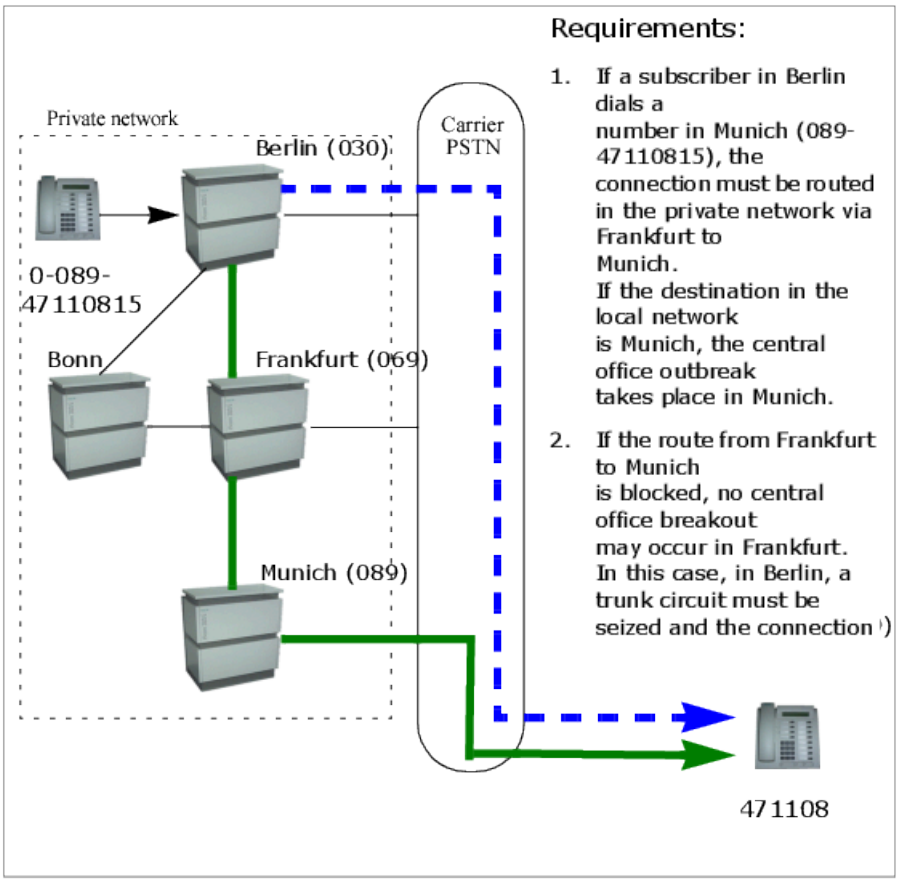


Figure 28: Central Office Breakout

5.16.5 Indirect Network Access

Example: Indirect network access to private network

In general, the requirement applies of routing local calls via PTT and long-distance calls via other Carriers. Access to the Carrier can be realized directly or indirectly via PTT.

Indirect access:

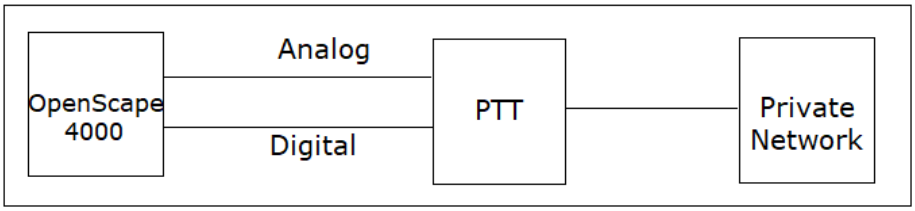


Figure 29: Indirect Network Access

Call setup procedure:

Station dials the number: 08972239500. The switch seizes a trunk circuit (digital) and sends the following digits:

131	CO call to private network. Dialing the D channel
Dial tone	System waits for second dial tone
Authorization code	Authorization code for network access, if required
08972239500	Number

The authorization code and the nummer are sent via the DTMF signaling in the B channel.

5.16.6 Dialing Plan

Not only the access code dialed by the subscriber is required for routing, but also the subsequent digits defined with AMO LDPLN.

5.16.7 Closed Numbering NWLCR (without LCR DIALING PLAN)

5.16.7.1 Feature Description

Switching is realized via the digit analysis (DPLN).

For RICHT MODE=CD and LRTE=x, the principle path selection is realized via the AMOs

RICHT-->LDAT--> LSCHD-->LODR (influencing AMO's KNLCR, LAUTH, LSCHD ...).

A number of type MODE=NETRTE is assigned to an LRTE (Route) established by the AMO RICHT. The LRTE number establishes the cross-reference to AMO LDAT.

The trunk group numbers (TGRP) must be identical with the information in AMO RICHT. The order of the assigned trunk groups is not important, as these are ordered by AMO LDAT with the parameter LVAL (LCR priority).

The LCR schedules are taken into consideration with the parameter LSCHED and additional LCR attributes can be stored for a route under LATTR.

5.16.7.2 Service Information

- The numbers of a closed numbering network must be unique.
- Closed numbering is used within Areas (so-called OpenScape 4000 Domains).
- The WABE entries in such a network (Area) must be consistent, i.e. entries for call numbers must lead to the corresponding destination number.
- Virtual node numbering structure in the case of closed numbering networks is not sensible in the I.M.
- With the help of the AMO WABE, the physical destination node number can be displayed.

- NWLCR is the typical OpenScape 4000 numbering with NPI=unknown, which is primarily used for the internal company area

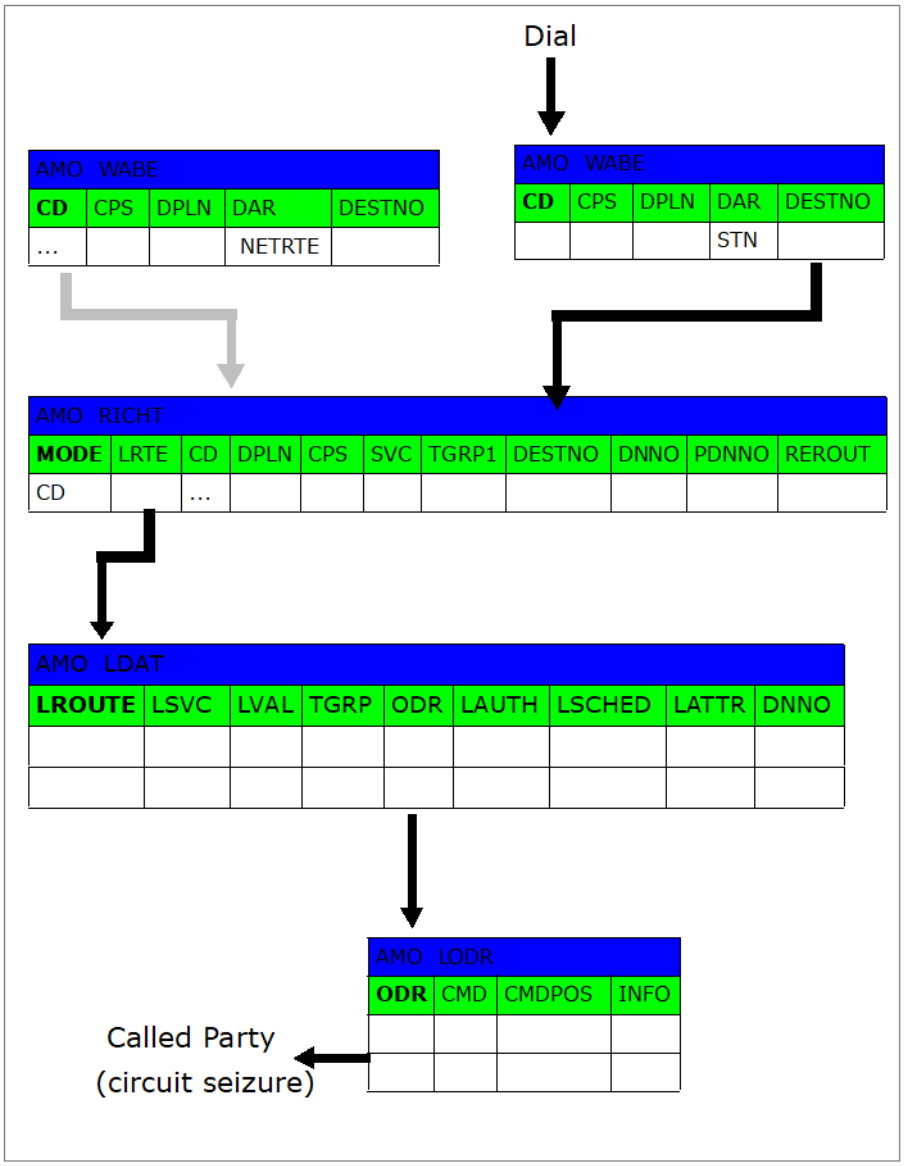


Figure 30: Call Setup Procedure via Networking LCR

5.16.7.3 Generation (Example)

- Setting up the digit analysis result for a routing code (AMO WABE NETRTE):
  `ADD-WABE:CD=20,DAR=NETRTE,CHECK=NO;`
- Setting up a route with utilizable trunk groups to destination node 1-89-200, with destination number 20 for voice connections (AMO RICHT):

```
ADD-RICHT:MODE=CD,LRTE=200,CD=20,CPS=0,SVC=SPVH,

NAME="TO NODE
 200",TGRP1=20&30&40,DESTNO=20,DNNO=1-89-200,

PDNNO=2-89-200,ROUTOPT=YES;
```

- Define dial rule with AMO LODR (repeat digit sequence dialed on line):
```
ADD-LODR:ODR=1,CMD=NPI,NPI=UNKNOWN,TON=UNKNOWN;

ADD-LODR:ODR=1,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=1,CMD=END;

ADD-LODR:ODR=1,INFO="CLOSED NUMBERING UNKNOWN";
```
- Set up primary route to route 200 with AMO LDAT (direct connection):
```
ADD-
LDAT:LROUTE=200,LSVC=VCE,LVAL=1,TGRP=20,ODR=1,LAUTH=1,

CARRIER=9,ZONE=EMPTY,LATTR=NONE;
```
- Set up secondary route to route 200 with AMO LDAT (alternative connection 1):
```
ADD-
LDAT:LROUTE=200,LSVC=VCE,LVAL=2,TGRP=30,ODR=1,LAUTH=10,

CARRIER=1,ZONE=EMPTY,LATTR=NONE;
```
- Set up alternative route to route 200 with AMO LDAT (alternative connection 2):
```
ADD-
LDAT:LROUTE=200,LSVC=VCE,LVAL=3,TGRP=40,ODR=1,LAUTH=10,

CARRIER=1,ZONE=EMPTY,LATTR=NONE;
```
- Set up station numbers as digit analysis result STN (AMO WABE):
```
ADD-WABE:CD=7200&&7298,DAR=STN;
```
- Refer station numbers to the destination number (here: 20, i.e. Node 1-89-200):
```
CHANGE-WABE:CD=7200&&7298,DESTNO=20;
```

5.16.7.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
RICHT	ART	d	Art der Adressierung der Richtung
	MODE	e	Address-mode of the route
	LRTG	d	LCR - Richtungsnummer
	LRTE	e	LCR - Route number
	KZ	d	Richtungskennzahl
	CD	e	Routing code
	DIENST	d	Dienst
	SVC	e	Communication service
	BUNU1	d	Buendelgruppe 1

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	TGRP1	e	Trunk group number 1
	REROUT	d	Reroute Kennzeichen
	REROUT	e	Set rerout-sign
	WABE	d	Wahlbewertungsgruppe
	DPLN	e	feature access group
	VKS	d	Verkehrssituation
	CPS	e	call progress state
	ZLNR	d	Zielanlagennummer
	DESTNO	e	destination number
	ZKNNR	d	Zielknotennummer
	DNNO	e	destination node number
	PZKNNR	d	Phys. Zielknotennummer
	PDNNO	e	Phys. destination node number
LDAT	LRTG	d	LCR-Richtungs Nummer
	LROUTE	e	LCR Route number
	LDIENST	d	LCR Dienst
	LSVC	e	LCR Service indicator
	BUNUM	d	Nummer des Buendels
	TGRP	e	Trunk group number
	LWR	d	LCR - Wahlregel Nummer
	ODR	e	LCR Out dial rule number
	LSCHED	d	LCR schedule
	LSCHED	e	LCR schedule
	LATTR	d	LCR-Attribut
	LATTR	e	LCR attribute
	ZKNNR	d	Zielknotennummer
	DNNO	e	destination node number
	LWERT	d	Wertigkeit des Richtungselements
	LVAL	e	priority of route element

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	LBER	d	erforderliche LCR-Berechtigung
	LAUTH	e	required lcr authorization
WABE	RNR	d	Verzweigungsparameter
	CD	e	access code / station number
	KZP	d	Kennzahlpunkt
	DAR	e	Digit analysis result
	WABE	d	Wabegruppe
	DPLN	e	feature access group / dial plan
	VKS	d	Verkehrssituation
	CPS	e	call progress state
	ZLNR	d	Zielnummer
	DESTNO	e	destination number
LODR	INFO	d	Service Informationen
	INFO	e	Service Informations
	LWREL	d	LCR-Wahlregel-Element
	CMD	e	Out Dial Rule Command
	LWR	d	LCR-Wahlregelnummer
	ODR	e	out dial rule
	LWRELPOS	d	Position des LCR-Wahlregelelementes
	CMDPOS	e	position of the command in the out dial rule

5.16.8 Open Numbering LCR (with LCR DIALING PLAN))

5.16.8.1 Feature Description

Switching access is realized via the digit analysis (WABE).

For RICHT MODE=LTRGENEW and LRTE=x, the principle path selection is realized via the AMOs LDPLN-->LDAT--> LSCHD-->LODR. (Influencing AMO'S KNLCR, LPROF, LAUTH, LSCHD, ...)

In AMO LDPLN, those routing codes with the digit pattern (RTECD from WABE) to be evaluated for LCR must be entered as the LCR digit pattern (LDP). With the parameter LAUTH (single value), you specify whether an LDP is allowed or blocked on a subscriber-specific basis. With the parameter LROUTE Number, you indicate the further call processing of the respective LDP with AMO LDAT. In the case of large digit pattern schedules, performance can be improved by means of OPTIIMIZE-LDPLN. See also AMO description LDPLN.

With the AMO LDAT, the trunk groups are linked with the values ODR, LAUTH and an LCR priority (LVAL) assigned to LCR route elements and prioritized for the LCR path selection. With the parameter ODR, you specify which LCR dial rule stipulated with AMO LODR is to be used with this trunk group. With the parameter LAUTH (single value), you specify the permissible access authorization (e.g. for subscribers). With the parameter LVAL, you specify the priority of a trunk group within an LRTE (LVAL=1 means highest priority). The seizure priority of the trunk group is thus specified. You have the option of assigning a host of trunk groups to the same LVAL. In this case, the trunk groups are simply searched through sequentially. All trunk groups are numbered consecutively (parameter LROUTE). The parameter LROUTE only serves to allow subsequent, selective deletion of an entry, not to assign an additional priority. With the parameter LSCHED, consideration is given to the LCR schedules.

In a network with several areas, a subscriber dials an area code and an extension in order to reach a subscriber from a different area. In this context, the extensions need only be unique within an area.

5.16.8.2 Service Information

IMPORTANT: All area codes (tie line access code) of a network must be unique and may not be station numbers.

- Open numbering and LCR are used to realize ISDN (E.164) and PNP (E.189) or EPNP numbering plans.

- The subscriber numbers of a network need not necessarily be unique in this context.

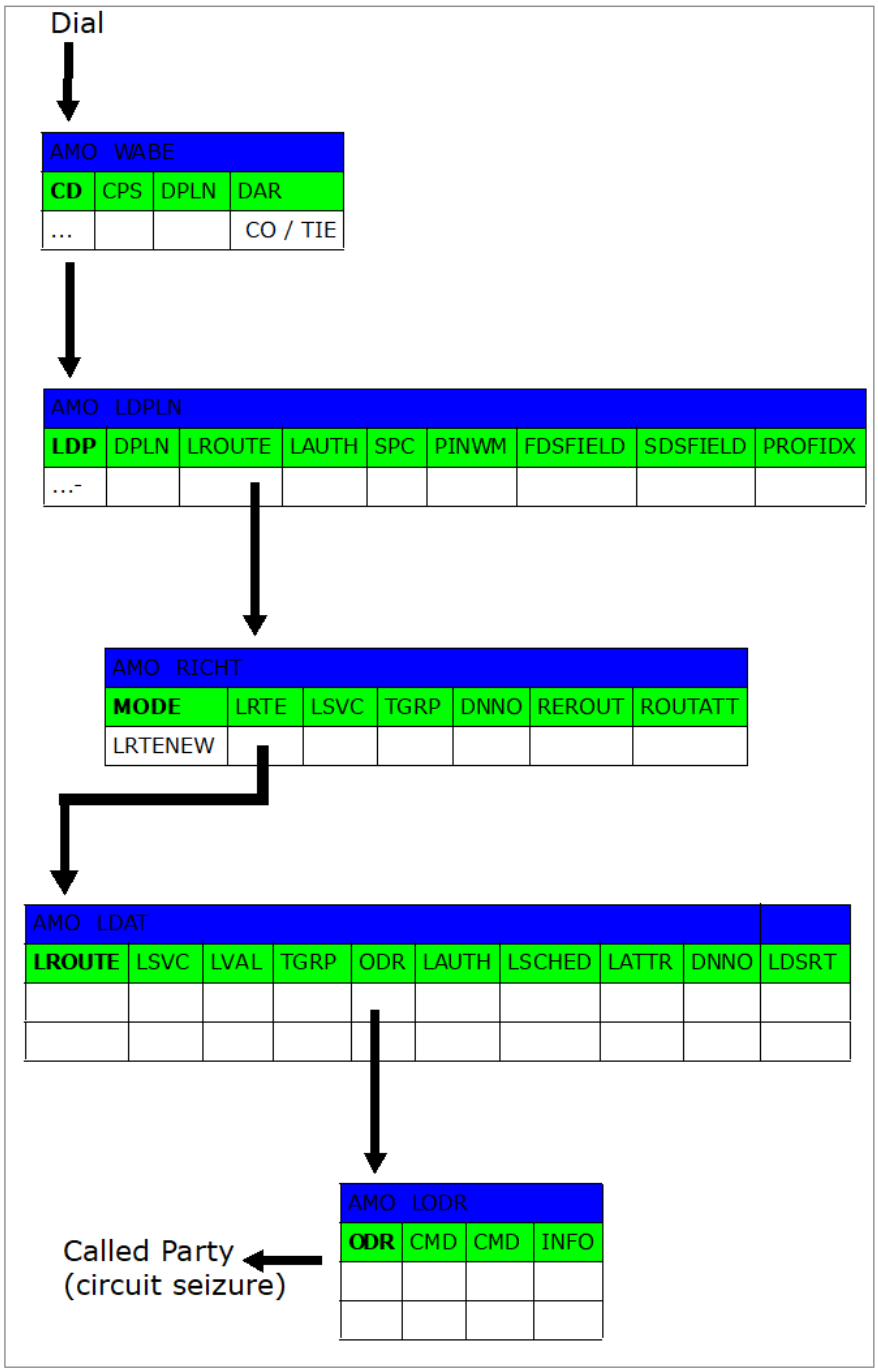


Figure 31: Call Setup Procedure via LCR

5.16.8.3 Generation (Example)

Example without additional LCR supplements and with only one route element.

- Setting up the digital analysis result TIE (AMO WABE):
  `ADD-WABE:CD=0,CPS=2&3&4&5&8&9&10&12,DAR=TIE,TEST=NO;`

- Set up the route with utilizable trunk groups to destination node 1-1-0 (CO) for connections of all services (AMO RICHT):
```
ADD-RICHT:MODE=LRTENEW,LRTE=91,LSVC=ALL,NAME="CO LOCAL",

TGRP=90,DNNO=1-1-0,INFO="ICN-CO ISDN LOCAL";
```
- Define dial rule with AMO LODR (send dialed digit sequence X on line and use ISDN with type Subscriber for the "calling party"):
```
ADD-LODR:ODR=91,CMD=ECHO,FIELD=3;

ADD-LODR:ODR=91,CMD=NPI,NPI=ISDN,TON=SUBSCR;

ADD-LODR:ODR=91,CMD=END;

ADD-LODR:ODR=91,INFO="ICN-CO ISDN LOCAL";
```
- Set up primary route to route 91 with AMO LDAT (direct connection to CO):
```
ADD-LDAT:LROUTE=91,LSVC=ALL,LVAL=1,

TGRP=90,ODR=91,LAUTH=2,CARRIER=1,ZONE=EMPTY,LATTR=WCHREG;
```
- Set up digit pattern with central office breakout code 0 and dial tone (AMO LDPLN):
```
ADD-LDPLN:LDP=0-W-X,LROUTE=91,LAUTH=2
```

5.16.8.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
RICHT	ART	d	Art der Adressierung der Richtung
	MODE	e	Address-mode of the route
	LRTG	d	LCR - Richtungsnummer
	LRTE	e	LCR - Route number
	DIENST	d	Dienst
	SVC	e	Communication service
	BUNUM	d	Buendelgruppe 1
	TGRP	e	Trunk group number 1
	REROUT	d	Reroute Kennzeichen
	REROUT	e	Set rerout-sign
	WABE	d	Wahlbewertungsgruppe
	DPLN	e	feature access group
	VKS	d	Verkehrssituation
	CPS	e	call progress state
	ROUTATT	d	Richtungsattribute

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	ROUTATT	e	Route attribute
	ZKNNR	d	Zielknotennummer
	DNNO	e	destination node number
LDAT	LRTG	d	LCR-Richtungs Nummer
	LROUTE	e	LCR Route number
	LDIENST	d	LCR Dienst
	LSVC	e	LCR Service indicator
	BUNUM	d	Nummer des Buendels
	TGRP	e	Trunk group number
	LWR	d	LCR - Wahlregel Nummer
	ODR	e	LCR Out dial rule number
	LSCHED	d	LCR schedule
	LSCHED	e	LCR schedule
	LATTR	d	LCR-Attribut
	LATTR	e	LCR attribute
	ZKNNR	d	Zielknotennummer
	DNNO	e	destination node number
	LWERT	d	Wertigkeit des Richtungselements
	LVAL	e	priority of route element
	LBER	d	erforderliche LCR-Berechtigung
	LAUTH	e	required lcr authorization
	LDSRT	d	Nummer der LCR Digit String Restriction Tabelle
	LDSRT	e	Number of LCR Digit String Restriction Table
WABE	RNR	d	Verzweigungsparameter
	CD	e	access code / station number
	KZP	d	Kennzahlpunkt
	DAR	e	Digit analysis result
	WABE	d	Wabegruppe

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	DPLN	e	feature access group / dial plan
	VKS	d	Verkehrssituation
	CPS	e	call progress state
LODR	INFO	d	Service Informationen
	INFO	e	Service Informations
	LWREL	d	LCR-Wahlregel-Element
	CMD	e	Out Dial Rule Command
	LWR	d	LCR-Wahlregelnummer
	ODR	e	out dial rule
	LWRELPOS	d	Position des LCR-Wahlregelelementes
	CMDPOS	e	position of the command in the out dial rule
LDPLN	LWM	d	LCR Wählmuster
	LDP	e	LCR digit pattern
	LBER	d	LCR Berechtigung
	LAUTH	e	LCR authorization level
	LRTG	d	LCR Richtungsnummer
	LROUTE	e	LCR Route number
	FDSFIELD	d	Index des Feldes in dem Anrufplan, das FDS enthaelt
	FDSFIELD	e	Index of the field in dialplan, which contains FDS
	SDSFIELD	d	Index des Feldes in dem Anrufplan, das SDS enhaelt
	SDSFIELD	e	Index of the field in dialplan, which contains SDS
	PINDP	d	PIN fuer Anrufplan gebraucht
	PINDP	e	PIN for dialing plan requested
	PROFIDX	d	LCR Profile Index
	PROFIDX	e	LCR Profile Index

5.16.9 Time Based LCR (AMO LSCHD)

5.16.9.1 Feature Description

With the AMO LSCHD, up to 8 schedules - designated with the letters A, B, C, .. G, H - can be defined in a table per internal traffic restriction group. These typically cover the week in schedules which correspond with call charging rates. Every internal traffic restriction group (ITR) has its own LCR schedule table. An entry is made for every day/hour combination, with minute and schedule. Every hour of every day is always assigned to a schedule. The minute determines the time within the hour at which the specified schedule is switched. If the current schedule for the expiring hour is unchanged, no switching occurs and the minute specification has no significance. The schedules configured in this way can be included during routing in AMO LDAT (parameter LSCHED), in order to determine a route (time based LCR).

5.16.9.2 Special Feature

In the event that the feature is released (AMO FEASU), a corresponding audio signal is supplied at the terminals in the case of a more expensive connection and a warning text displayed on voice terminals (with the exception of attendant consoles and bus terminal devices). The attribute Expensive is assigned to a route element as a function of the weekday and the time of day.

5.16.9.3 Service Information

- The table is implemented and initialized per ITR group in the database (with 00 A)
- You can only change it. Therefore, the AMO LSCHD has no actions for ADD and DELETE.
- If schedules are not specified, AMO LDAT enters all schedules.

5.16.9.4 Generation (Example)

The following table presents an excerpt of a specimen configuration with two changes.

Schedule B = Monday to Friday 07.00 - 17.59 hrs Schedule C= Monday to Friday 18.00 - 22.59 hrs

- Change schedule for Monday to Friday from 07.00 - 17.59 Hrs to B:

```
CHA-LSCHD:ITR=0&&15, DAY=MON&TUE&WED&THU&FRI,
 HOUR=7&&17,
SCHED,MINUTE=59;
```

- Change schedule for Monday to Friday from 18.00 - 22.59 Hrs to C:

```
CHA-LSCHD:ITR=0&&15, DAY=MON&TUE&WED&THU&FRI,
 HOUR=18&&22,
```

```
SCHED=C,MINUTE=59;
```

- Assign schedule of a route with parameter LSCHED: (In this example, trunk group 200 can only be seized in schedule B)

```
ADD-LDAT:LROUTE=3, LSVC=VCE, LVAL=2, TGRP=200, ODR=6,
 LAUTH=1,
LSCHED=B;
```

HOUR	SUN	MON	TUE	WED	THU	FRI	SAT
00	00 A	00 A	00 A	00 A	00 A	00 A	00 A
01	00 A	00 A	00 A	00 A	00 A	00 A	00 A
02	00 A	00 A	00 A	00 A	00 A	00 A	00 A
03	00 A	00 A	00 A	00 A	00 A	00 A	00 A
04	00 A	00 A	00 A	00 A	00 A	00 A	00 A
05	00 A	00 A	00 A	00 A	00 A	00 A	00 A
06	00 A	00 A	00 A	00 A	00 A	00 A	00 A
07	00 A	00 B	00 B	00 B	00 B	00 B	00 A
08	00 A	00 B	00 B	00 B	00 B	00 B	00 A
			Excerpt				
20	00 A	00 C	00 C	00C	00 C	00 C	00 A
21	00 A	00 C	00 C	00 C	00 C	00 C	00 A
22	00 A	00 C	00 C	00 C	00 C	00 C	00 A
23	00 A	00 A	00 A	00 A	00 A	00 A	00 A

5.16.9.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
LSCHD	VBZ	d	Verkehrsbeziehungsgruppe
	ITR	e	Internal Traffic Restriction Group
	TAG	d	Wochentag
	DAY	e	Weekday
	STUNDE	d	Stunde
	HOUR	e	Hour

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	SCHED	d	Zeitband fuer diese Tag-Stunden-Kombination
	SCHED	e	Schedule for this day/hour combination
	MINUTE	d	Minute des Zeitbandwechsels
	MINUTE	e	Minute of Schedule change
LDAT	LRTG	d	LCR-Richtungsnummer
	LROUTE	e	LCR route number
	LDIENST	d	LCR Dienst
	LSVC	e	LCR Service indicator
	LWR	d	LCR-Wahlregelnummer
	ODR	e	LCR Out Dial Rule Number
	LSCHED	d	LCR Schedule
	LSCHED	e	LCR schedule

5.16.10 LCR Restriction Tables (AMO LDSRT)

5.16.10.1 Feature Description

A max. of 16 restriction tables (LDSRT) can be administrated with the AMO LDSRT. Each of these tables allows the blocking of individual digit strings, which can be broken down into two areas (FDS and SDS). The digit pattern fields to be included for the check of the FDS/SDS areas are specified in AMO LDPLN. The applicable table is optionally assigned one or more routes when using the restriction tables in AMO LDAT with the parameter LDSRT.

If no correlation between the administrated areas (FDS and SDS) is found with the specified digit pattern fields in the digit pattern dialed, the LCR for this route is continued.

If the entries in the LDSRT table agree with the specified digit pattern fields, the connection is not established via this route (trunk group) and the LCR is continued with the next route. (If no further route is defined, or if the authorization is inadequate, the LCR is terminated.)

This feature is typically used if a system is connected to several carriers. Certain digit sequences (digit strings) are not, however, accepted by all carriers.

5.16.10.2 Service Information

- If an entry exists in the table for an FDS area, but no entry exists under the SDS area, all further digit strings are blocked (as of the SDS area).
- Several LDSRT tables can also be assigned to one route.
- A route in which the LDSRT test fails is not suitable to be inserted into a queue (Chapter on page 433)
- If a large number of entries are needed in the LDSRT table, it may be necessary to modify the value LCRDSR of the AM DIMSU, i.e. to further increase it.
- This function can also be combined with other LCR features.

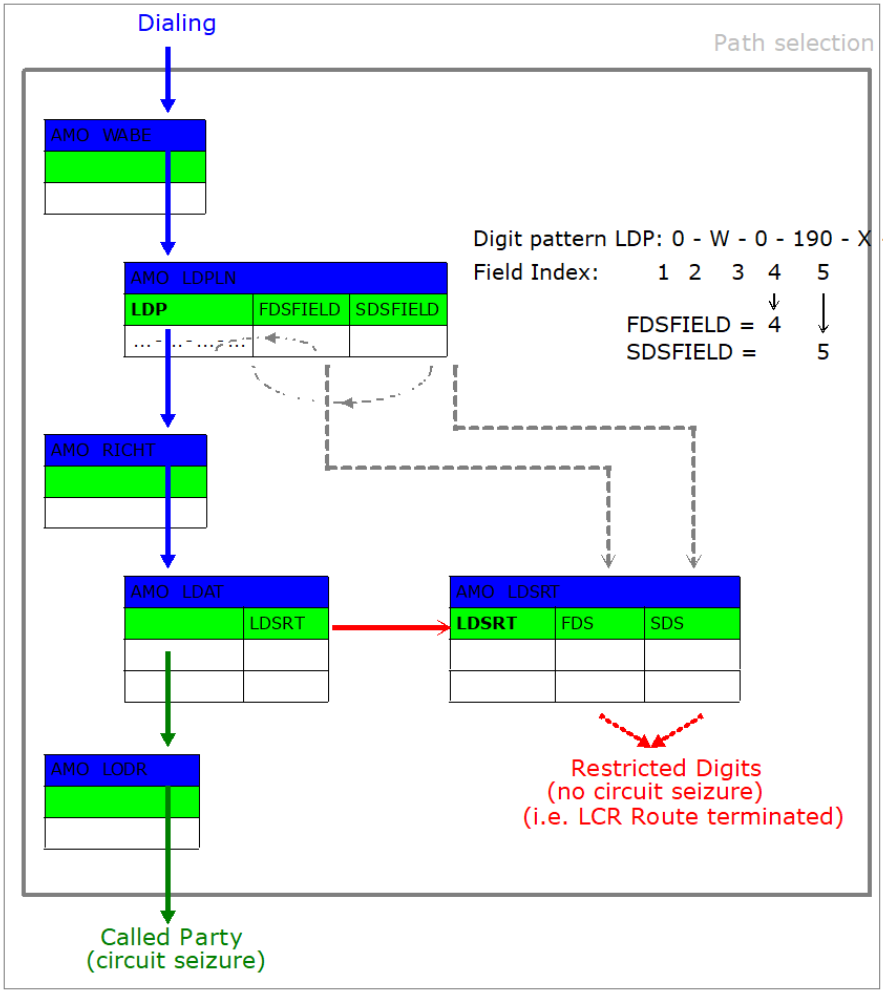


Figure 32: Call Setup Procedure with Restriction Tables

5.16.10.3 Generation (Example)

- Expansion of the DIMSU buffer (here: to the value 100):
  `ADD-DIMSU:TYPE=NETWORK,LCRDSR=100;`

- Setting up the restriction table with the AMO LDSRT (Table 1 for Digit String 190 with Sub Digit Strings 5 or 7 and Table 2 for 190 with all possible Sub Digit Strings):

  ```
  ADD-LDSRT:LDSRT=1,FDS=190,SDS=5&7;

  ADD-LDSRT:LDSRT=2,FDS=190;
  ```

- The AMO LDPLN is required in order to specify the field of an LDP to be prioritized:

  ```
  ADD-LDPLN:LDP=0-W-0-190-X-X,LROUTE=1,LAUTH=1,
  FDSFIELD=4,SDSFIELD=5;
  ```

- The AMO LDAT is required in order to refer to the desired LDSRT table (Table 1 is used in the primary route in this case, and Table 2 for the secondary route):

  ```
  ADD-LDAT:LROUTE=1,LSVC=VCE,LVAL=1,TGRP=200,ODR=1,
  LAUTH=1,LDSRT=1;

  ADD-LDAT:LROUTE=1,LSVC=VCE,LVAL=2,TGRP=201,ODR=2,
  LAUTH=1,LDSRT=2;
  ```

  Digit pattern (Example)

Dialed number	Primary route forbidden	Secondary route forbidden
001900X : 001904X		LDSRT 2
001905x	LDSRT 1	LDSRT 2
001906x		LDSRT 2
001907x	LDSRT 1	LDSRT 2
001907x : 001909x		LDSRT 2

  In this example, all numbers with the access code 0190 are generally forbidden for the secondary route, with this prohibition only being restricted to numbering blocks 5 and 7 in the primary route.

5.16.10.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
LDSRT	LDSRT	d	Nummer der LCR Digit String Restriction Tabelle

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	LDSRT	e	Number of LCR Digit String Restriction Table
	FDS	d	Nummer des First Digit Strings
	FDS	e	First Digit String Number
	SDS	d	Nummer des Sub Digit Strings
	SDS	e	Sub Digit String Number
LDPLN	LWM	d	LCR Wählmuster
	LDP	e	LCR digit pattern
	LBER	d	LCR Berechtigung
	LAUTH	e	LCR authorization level
	LRTG	d	LCR Richtungsnummer
	LROUTE	e	LCR Route number
	FDSFIELD	d	Index des Feldes in dem Anrufplan, das FDS enthaelt
	FDSFIELD	e	Index of the field in dialplan, which contains FDS
	SDSFIELD	d	Index des Feldes in dem Anrufplan, das SDS enhaelt
	SDSFIELD	e	Index of the field in dialplan, which contains SDS
LDAT	LRTG	d	LCR-Richtungsnummer
	LROUTE	e	LCR route number
	LDIENST	d	LCR Dienst
	LSVC	e	LCR Service indicator
	BUNUM	d	Nummer des Buendels
	TGRP	e	Trunk group number
	LWR	d	Nummer der LCR-Wahlregel
	ODR	e	LCR Out Dial Rule Number
	LDSRT	d	Nummer der LCR Digit String Restriction Tabelle
	LDSRT	e	Number of LCR Digit String Restriction Table

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
DIMSU	LCRDSR	d	Anzahl der gesperrten Ziffernfolgen fuer LCR Route Ele.
	LCRDSR	e	Number of blocked digit strings for lcr route elements

5.16.11 LCR Autorization PIN (Forced Authorization Code)

5.16.11.1 Feature Description

A PIN code is required for certain voice numbers configured in the LCR dial plan for public network access or for access to tie trunk circuits for which a consultation call was selected for the first call or a call forward was selected during execution. A typical application case is, for example, on a campus, where users have to identify themselves via PIN on generally accessible phones for the purposes of call charging.

This PIN code can be dialed after the external number has been dialed (suffix dialing), or prior to that via the COPIN digit analysis result (preselection). A PIN is never demanded in transit systems, and a PIN code request is never sent in the originating system.

A distinction is made between three manifestations in the case of the PINWM feature (PIN digit pattern):

Unchecked (PCODE) In this case, the PIN code comprises a defined number of digits. In the existing PIN; this corresponds to the project code PCODE. The behavior in the case of Unchecked, as well as its administration, is likewise the same as for the PCODE.

Checked (PIN Mobile) In this case, the PIN code must agree exactly. In the existing PIN, this corresponds to the PIN Mobile. The behavior in the case of Checked, as well as its administration, is likewise the same as for PIN Mobile.

Restricted (PIN Mobile with IDHome) Restricted corresponds to Checked, but the "IDHome" feature is additionally set in the COPIN. This results in the PIN code only being accepted at the base station.

The PINWM (PIN digit pattern) feature is based on the existing PIN concepts (PIN mobile, PCODE,...) and likewise uses existing PIN procedures. In order to setup PINWM, the STN personal identification numbers must first be configured. A new type of PIN (COPIN) has been added. Whether or not a number in the network is subject to the PINWM test is administrated in the LCR digit pattern. For this digit pattern, an LDPLN entry then has to exist with parameter PINWM=YES (Default = No). If an incorrect PIN is entered when the PIN is requested, the LCR is triggered.

IMPORTANT: During administration, it must be noted that the PINWM is only of relevance for the first outgoing connection, and that a check of the PINWM in a transit system no longer

takes place. Numbers which are administrated as closed numbering cannot be subject to the PINWM.

5.16.11.2 User Interface

The user interface is essentially influenced by the following factors.

- Dialing the PIN with preselection (PCODE APIN10) or suffix dialing
- Entry of the PIN necessary in the case of PININT or PINNW
- Signaling of the calling party at the called party after identification via PIN entry.

1) The PIN is dialed in preselection:

Before the number is dialed, the COPIN for PINWM is activated via the own code (APIN10). This procedure is absolutely identical to identification via digital analysis result.

2) The PIN is dialed in suffix dialing:

The following procedure applies to the Anate and Digite terminal devices:

- The calling party dials the complete number of the called party
- Calling party hears the Recall-Dial tone

  In the event of:

  – PININT activated: Calling party dials the correct PIN code
  – PINNW activated: Calling party dials home station number, followed by # , then the correct PIN code and # again.
- Calling party hears the Confirmation tone

5.16.11.3 Service Information

- In the case of digital terminal devices with display, the user prompting is realized on the TE display with PINWM.
- If authorization NPINWM (AMO COSSU) is set for a station in its COS, the PIN test is thus broken through, i.e. the STN need not enter a PIN (optional authorization), even if a test is envisaged for the digit pattern.
- If a valid PIN has been activated in preselection for PINWM testing (via PCODE APIN10), the call can be continued without the PIN having to be suffix dialed.
- A PIN activated by preselection is reset via PCODE (DPIN); the PIN can likewise be deactivated through the Timeout of a timer (authorization code timer). This timer is restarted for each call in which the PIN is to be tested.
- In the case of PINWM, it is possible to enter the PIN at the TE in a remote system. In this context, the PIN test is performed at the TE in the home station, to which end the station number always has to be dialed before the PIN for PINWM . In this case, the station number, the COPINNr and the PIN are sent in the home station. (Presupposing the PINNW feature is released with AMO FEASU)
- The PINWM is entered in the call detail record (see CDR and/or CDRe).
- If an incorrect PIN code is entered, this negative case is signaled and the calling party has to restart the dialing procedure from the beginning.
- PINWM test is only available for voice services.

- In the case of attendant consoles and funct. terminal equipment, it is not possible to enter a PIN code for PINWM.
- The AMO LDPLN indicates which digit patterns are subject to a PINWM test.
- Other COPINÂ´s can be declared as valid for the PINWM feature via the parameter DPTEST. Thus, several COPINÂ´s can also be used for the PINWM feature.

5.16.11.4 Generation (Examples)

Setting up a specimen PINWM for STN

At first, PIN's must be configured for the STN.

- Increase PIN-Buffer:

```
ADD-DIMSU:TYPE=USER,PINBUF=80;
```

- Release the PININT function for the system:

```
CHANGE-FEASU:TYPE=RELEASE,CM=PININT;
```

- Release the PINNW function for the switch:

```
CHANGE-FEASU:TYPE=RELEASE,CM=PINNW;
```

- Set the COT parameter for the circuits in the case of PINNW:

```
ADD-COT:COTNO=2,PAR=PINR;
```

- COPIN10 in the event of Unchecked (PCODE)

```
ADD-PERSI:TYPE=SYS,PIN10LEN=6;

CHANGE-
PERSI:TYPE=COPIN,COPIN=10,COTYPE=PCODE,PINTEXT="FAC,
1CALL)", CDRTEXTS=NO,DISPRSTN=NO,PINTEST=LENGTH,TRKCD=0,
TRKCDTYP=NO,PINDUR=ONE,TRANSFER=NO,IDHOME=NO,
DISPID=PERMDISP,TRACE=NO,PINEXT=YES,DISPPIN=YES,PINNKEY=NO,
DEACKEY=NO,POSCHKN=1,COSHOME=NO,PINLCOS2=NO,DPTEST=NO;
```

The COPIN10 is setup as standard for Unchecked (PCODE). Of course, the settings can also be made in a different COPIN (see Service Info).

COPIN10 for the event of Checked (PIN Mobile)

```
ADD-PERSI:TYPE=SYS,PIN10LEN=6;

CHANGE-PERS:TYPE=COPIN,COPIN=10,COTYPE=MOBILE,
PINTEXT="FAC,(1CALL)",CDRTEXTS=NO,DISPRSTN=NO,
PINTEST=TABLE,TRKCD=0,TRKCDTYP=NO,PINDUR=TIME,
TRANSFER=ALL,IDHOME=NO,DISPID=PERMDISP,TRACE=NO,PINEXT=YES,
DISPPIN=NO,PINNKEY=NO,DEACKEY=NO,POSCHKN=1,COSHOME=NO,
PINLCOS2=NO,DPTEST=NO;

ADD-PERSI:TYPE=STN,STNO=7140,NAME="PINWMCHE"
PIN10="103157",PININDIV=YES;
```

The COPIN10 is setup as standard for Unchecked (PCODE). Of course, the settings for Checked can also be made in a different COPIN.

- COPIN10 for the event of Restricted (PIN Mobile with IDHome)

```
ADD-PERSI:TYPE=SYS PIN10LEN=6;

CHANGE-PERSI:TYPE=COPIN,COPIN=10,COTYPE=MOBILE,
PINTEXT="FAC,(1CALL)",CDRTEXTS=NO,DISPRSTN=NO,
PINTEST=TABLE,TRKCD=0,TRKCDTYP=NO,PINDUR=TIME,
TRANSFER=ALL,IDHOME=YES,DISPID=PERMDISP,TRACE=NO,PINEXT=YES,
DISPPIN=NO,PINNKEY=NO,DEACKEY=NO,POSCHKN=1,COSHOME=NO,
PINLCOS2=NO,DPTEST=NO;

ADD-PERSI:TYPE=STN,STNO=7140,NAME="PINWMRES",
PIN10="103157", PININDIV=YES;
```

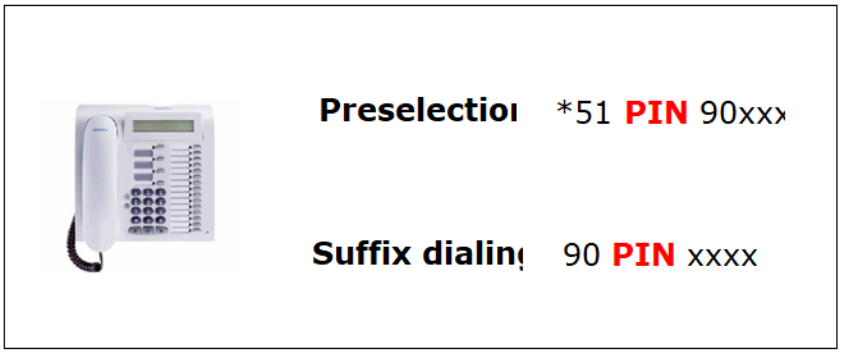


Figure 33: Example of a user interface

PINWM preparation for preselection

- Setup DAR for PIN (DTMF AND DP):

```
ADD-WABE:CD=*51,DAR=APIN10,CHECK=NO;

ADD-WABE:CD=*851,DAR=APIN10,CHECK=NO;
```

- Setup timeout for voice (300 seconds as standard):

```
CHANGE-CTIME:TYPESWU=CP2,PINVO10=300,PINNV10=1800;
```

PINNV10 has no relevance to PINWM, as only valid for Voice.

Setup PINWKZ for suffix dialing

- Assign LCOSV the COPIN 10:

```
CHANGE-COS:TYPE=LCOSV,LCOSV=5,COPIN=10;
```

In the LCOSV, the type of PIN code to be tested is assigned (Unchecked, Checked, Restricted).

- Setup "Recall dial tone" and "Confirmation tone":

```
CHANGE-ZAND:TYPE=ALLDATA2,CONFTONE=YES;
```

- Break through authorization (STN with COS No. 13 need not suffix dial a PINWM):

```
CHANGE-COSSU:TYPE=COS, COS=13,AFAX=NPINDP;
```

It is never necessary to dial a PIN code with breakthrough authorization.

- Declare COPIN 1 valid for PINWM:

  ```
  CHANGE-PERSI:TYPE=COPIN,COPIN=1,DPTEST=YES;
  ```

  If an STN has presented identification through preselection of COPIN1 and the parameter DPTEST=YES is set in COPIN1, this COPIN1 counts as being an already activated PINWM COPIN and renewed dialing of the PIN code (in suffix dialing) is thus rendered superfluous.

Activate PINWM for an LCR digit pattern (with PIN prompt):

```
ADD-LDPLN:LDP="90"-"XXXX",LROUTE=190,LAUTH=3,
SPC=22,PINDP=YES;
```

The digit pattern must correspond to a block dial. Otherwise, dialing the number is interrupted by entry of the PIN. The rest of the number then has to be suffix dialed.

5.16.11.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COSSU	TYP	d	Verzweigungsparameter
	TYPE	e	Desired cossu option
	LCOSS	d	LCR-Class-of-Service Nummer fuer Sprache (FAX)
	LCOSV	e	LCR class of service number for voice (FAX)
	COPIN	d	class of pin for dialing pattern
	COPIN	e	class of pin for dialing pattern
COT	COTNU	d	Class of Trunk (Nummer)
	COTNO	e	Class of Trunk
	COTPAR	d	Parameterwerte für eine Class of Trunk
	PAR	e	Parameter values of a Class of Trunk
CTIME	ARTSWU	d	Verzweigungsparameter
	TYPESWU	e	Desired timer category
	PINVO10	d	Überwachungszeit fur Gültigkeit der PIN COPIN 10 SPR
	PINVO10	e	time for validation of the pin of COPIN 10 for voice

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	PINNV10	d	Überwachungszeit fur Gültigkeit der PIN COPIN 10- NV
	PINNV10	e	time for validation of the pin of COPIN 10 for non voice
DIMSU	PINBUF	d	anz. der dyn. PIN Speicher bei netzweiter Identifizierung
	PINBUF	e	no. of dynamic pin buffers for network-wide identification
FEASU	TYP	d	Typ der Verarbeitung
	TYPE	e	Desired class mark facility options
	LM	d	Leistungsmerkmal
	CM	e	Feature, class mark, facility
LDPLN	LWM	d	LCR Wählmuster
	LDP	e	LCR digit pattern
	LBER	d	LCR Berechtigung
	LAUTH	e	LCR authorization level
	LRTG	d	LCR Richtungsnummer
	LROUTE	e	LCR Route number
	PINDP	d	PIN fuer Anrufplan gebraucht
	PINDP	e	PIN for dialing plan requested
PERSI	TYP	d	Verzweigungsparameter
	TYPE	e	desired personal identification options
	COPIN	d	class of pin
	COPIN	e	class of pin
	PINTYP	d	Typ fuer netzw. transfer der copin im Cornet Protokoll
	PINTYPE	e	type of pin
	PIN10LAE	d	Laenge der PIN fuer pin-art 10
	PIN10LEN	e	Length of pin for pin type 10
	WMPRUEF	d	PIN art ist gueltig fuer Wahlmusterpruefung

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	DPTEST	e	PIN type is valid for dailing pattern check
	PINDAUER	d	Dauer der aktiviertenPIN
	PINDUR	e	duration of the activated pin
	PINPRUEF	d	PIN Pruefung
	PINTEST	e	pin test
WABE	RNR	d	Verzweigungsparameter
	CD	e	Access code / station number
	KZP	d	Kennzahlpunkt
	DAR	e	Digit analysis result
ZAND	TYP	d	Auswahl des Datentyps
	TYPE	e	Desired system option
	CONFTON	d	Ein/ausschalten beep Mechanismus im DH
	CONFTONE	e	Act/deact beep mechanism in DH

5.16.12 LCR Classes of Service LCOS (AMO COSSU)

5.16.12.1 Feature Description

There are 64 LCR class marks which can be used for controlling the dialing plan prioritization and for trunk group selection within a route.

All told, 32 LCR classes of service (LCOSV and LCOSD) can be created with the combination of the 64 class marks (LCOS). In addition to its conventional COS, every station, circuit and attendant console is also assigned an LCOSV/ LCOSD setup with the AMO COSSU for the authorization test in the case of LCR. The LCOS's of the LCOSV/LCOSV are prioritized in the path selection when outgoing in the case of the AMO's LDPLN / LDAT IN. In the case of circuits whose signalisation behavior does not allow the transmission of the LCR class marks, the COT parameter OLCR / OLRD (signalisation procedure without LCR) must be set. In this case, the LCR class marks of the circuit (e.g. assigned with AMO TDCSU, parameter LCOSV) are used for all incoming calls.

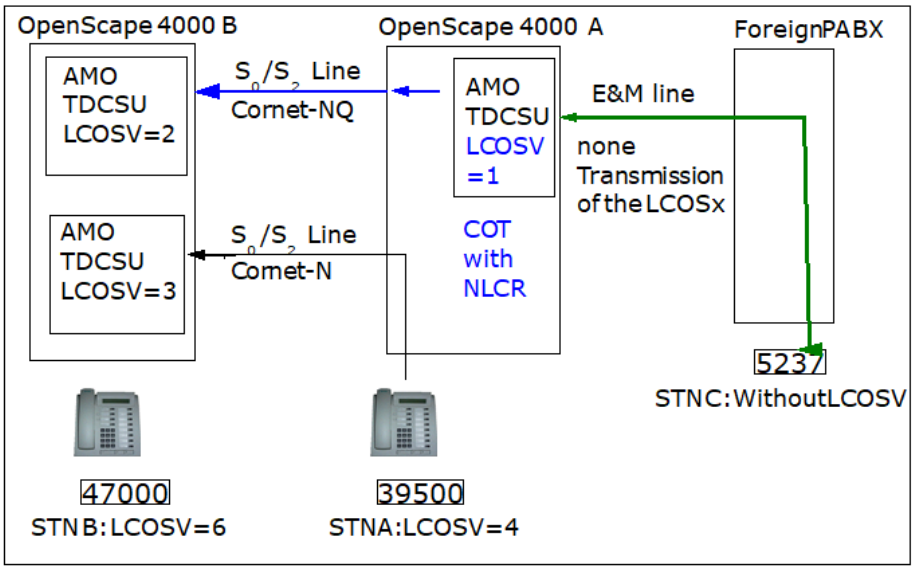


Figure 34: LCR Class Mark Transmission

5.16.12.2 Service Information

- The LCR class marks of the stations are transmitted network-wide with Cornet.
- Without the corresponding COT parameters NLCR / NLRD (signalising without LCR), the LCOSV/LCOSD values in the circuits are of no relevance.
- During path selection, the LCOS's of an LCOSV/LCOSD can be temporarily changed by means of the AMO KNLCR.

5.16.12.3 Generation (Example)

For STN A, LCOSV=4 (assigned in AMO SCSU/SBCSU) applies in the path selection in the OpenScape 4000 A and also the OpenScape 4000 B. STN C has no LCOS attributes and, with COT parameter NLCR set in OpenScape 4000 A, is assigned the prefixed LCOS value in the circuit, which is then further transmitted in the network and used for authorization checking (see diagram "LCR Class Mark Transmission").

- Enter the authorization code in the outpulsing with AMO LODR:
  ```
  CHANGE-COSSU:TYPE=LCOSV,LCOSV=1,ALCR=2,INFO="LCOS
   FOREIGN
  SYSTEMS";
  ```
- Enter the authorization code in the outpulsing with AMO LODR:
  ```
  ADD-COT:COTNO=100,PAR=DFNN,INFO="COT FOR FOREIGN
   SYSTEMS";
  ```

5.16.12.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COSSU	TYP	d	Verzweigungsparameter
	TYPE	e	Desired cossu option
	LCOSS	d	LCR-Class-of-Service Nummer fuer Sprache (FAX)
	LCOSV	e	LCR class of service number for voice (FAX)
	LCOSD	d	LCR-Class-of-Service Nummer fuer Daten (DEE)
	LCOSD	e	LCR class of service for data (dte)
	ELBER	d	Einzufuegende LCR-Berechtigung
	ALCR	e	LCR classmarks to be activated
	INFO	d	Service Informationen z.b. fuer welchen Leitungstyp die LCOS geeignet ist
	INFO	e	Service information e.g. what kind of trunk matches with LCPOS
COT	COTNU	d	Class of Trunk (Nummer)
	COTNO	e	Class of Trunk
	COTPAR	d	Parameterwerte für eine Class of Trunk
	PAR	e	Parameter values of a Class of Trunk
	INFO	d	Service Informationen z.B. für welchen Leitungstyp die COT geeignet ist.
	INFO	e	Service Information e.g. what kind of trunk matches with COT

5.16.13 LCR Authorization Codes (AMO LAUTH)

5.16.13.1 Feature Description

Definition table of the authorization codes for access from a private network to services of public third-party providers. The codes entered in this table

can be used with the dial rule (dial rule element OUTCODE in AMO LODR) for outpulsing purposes. In this context, the link between the two AMOs is established via the parameter INDEX.

5.16.13.2 Service Information

The authorization codes can be implemented in the database per ITR Group.

IMPORTANT: During administration, the authorization code can be entered both in encrypted and unencrypted form. However, only the encrypted form is regenerated.

5.16.13.3 Generation (Example)

The digit pattern 0-W-031-X is to refer to trunk group 12, which leads to a provider who requires authentication via code "123456789".

- Enter authorization code with parameter CODE in AMO LAUTH:
  ```
  EINR-LAUTH:ITR=0,INDEX=1,FORMAT=NORMAL,CODE=123456789;
  ```
- Define LCR route with AMO RICHT
  ```
  ADD-RICHT:MODE=LRTENEW,LSVC=VCE,LRTE=12,NAME="VENDOR 2",

  TGRP=12;
  ```
- Enter authorization code in the outpulsing with AMO LODR:
  ```
  ADD-LODR:ODR=12,INFO="WITH OUTPULSING 1";

  ADD-LODR:ODR=12,CMD=OUTCODE,INDEX=1;

  ADD-LODR:ODR=12,CMD=ECHO,FIELD=3;

  ADD-LODR:ODR=12,CMD=ECHOALL;

  ADD-LODR:ODR=12,CMD=END;
  ```
- Use AMO LDAT to assign LCR dial rule (ODR) to a route (LROUTE):
  ```
  ADD-
  LDAT:LROUTE=12,LSVC=VCE,LVAL=1,TGRP=12,ODR=12,LAUTH=1;
  ```
- Setup LCR digit pattern (LDP) with AMO LDPLN:
  ```
  ADD-LDPLN:LDP= 0-W-031-X,LROUTE=12,LAUTH=1;
  ```

5.16.13.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
LAUTH	VBZ	d	Nummer der Verkehrsbeziehungsgruppe
	ITR	e	Internal traffic restriction group number

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	INDEX	d	Index des Berechtigungscodes
	INDEX	e	Index of Authorization Code
	FORMAT	d	Eingabe des Berechtigungscode normal oder verschluesselt
	FORMAT	e	Use normal or encrypted format
	CODE	d	eingerichteter Berechtigungscode
	CODE	e	Normal authorization code
LODR	INFO	d	Service Informationen
	INFO	e	Service Informations
	LWREL	d	LCR-Wahlregel-Element
	CMD	e	Out Dial Rule Command
LDAT	LRTG	d	LCR-Richtungsnummer
	LROUTE	e	LCR route number
	LDIENST	d	LCR Dienst
	LSVC	e	LCR Service indicator
	BUNUM	d	Nummer des Buendels
	TGRP	e	Trunk group number
	LWR	d	LCR-WahlregelNummer
	ODR	e	LCR Out Dial Rule Number

5.16.14 LCR Source Dependant (AMO KNLCR)

5.16.14.1 Feature Description

As a function of the combination of source/destination nodes, different LCR routes can be selected without rendering a special LCOS assignment necessary. This source/destination controlled seizure of LCR routes is achieved through modification of the LCR class marks (LCR-LCOS's from LCOVS or LCOSD - i.e. service-independent) upon entry in the path selection) with the AMO KNLCR.

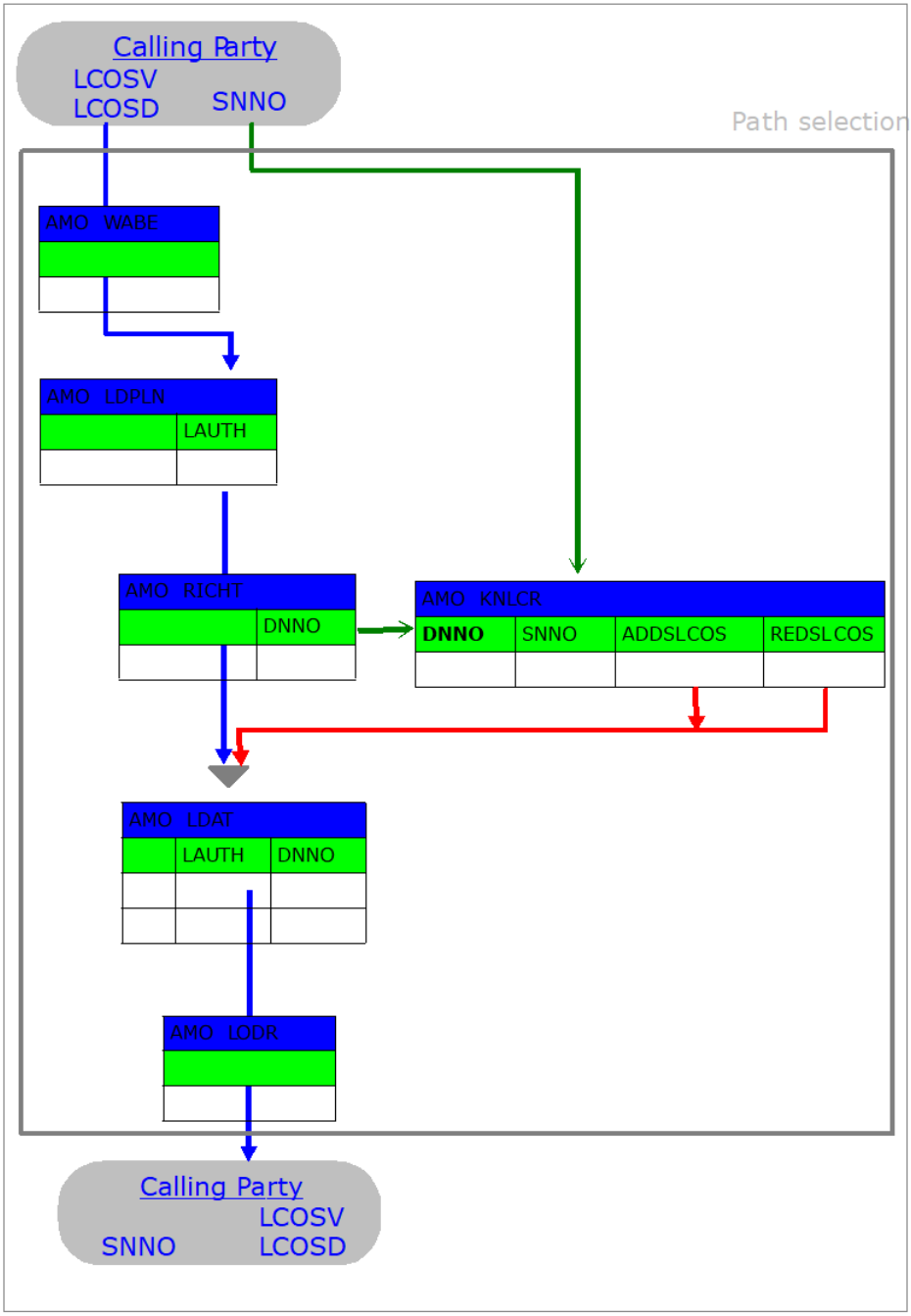


Figure 35: Procedure for a Source Independent Call Setup

As every connection is specified by a combination of source node and destination node, an expansion or reduction of individual LCOS's can be administrated for a node number pair (SNNO / DNNO). These changes in the authorization transmitted are taken into account during the test of the access rights in AMO LDAT, in order to seize a trunk group. Thus, the option of using or blocking an LCR route can be enabled both for single and multiple nodes of a network. (e.g.: to prevent or selectively enable central office breakouts.)

5.16.14.2 Service Information

- Source / destination node numbers can also be in other physical nodes.
- Source and destination node numbers must be virtual node numbers of the same priority.
- Renewed transit through the modification also takes place in the case of rerouting.

IMPORTANT: Modification of the LCOS's only serves the path selection within the routes defined in AMO LDAT and is not permanently changed or propagated.

- This function can also be combined with other LCR features.

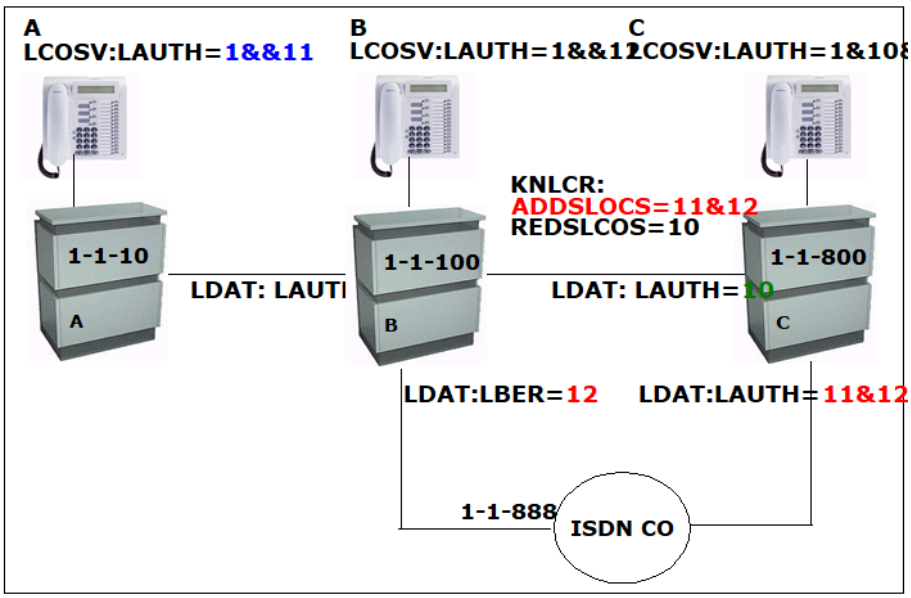


Figure 36: Example of a Source Dependent Call Setup

5.16.14.3 Generation (Example)

From Node A (NNO=1-1-10) to Node B (NNO=1-1-100), as well as Node C (NNO=1-1-800), the connection from Node A is to be possible for all subscribers. Subscriber A can call B and C, but cannot use the secondary route in Node B to CO ISDN (NNO=1-1-888) via a tie trunk to Node C (NNO=1-1-800) - for which the LAUTH 10 is likewise necessary.

- Definition of access modifications with reduction of the LAUTH 10 and additional expansion of the LAUTH 11&12 for access to the trunk:
  `ADD-KNLCR:SNNO=1-1-10,DNNO=1-1-888,ADDSLCOS=11&12, REDSLCOS=10;`

5.16.14.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
KNLCR	UKNNR	d	Ursprungsknotennummer
	SNNO	e	Source node number
	ZKNNR	d	Zielknotennummer
	DNNO	e	Destination node number
	ERWLBER	d	Erweiterung der vorgegebenen LCR-Berechtigung
	ADDSLCOS	e	Add to LCR classmark subset
	REDLBER	d	Reduzieren der vorgegebenen LCR-Berechtigung
	REDSLCOS	e	Reduce the LCR classmark subset

5.16.15 LCR Source Groups (AMO LPROF)

5.16.15.1 Feature Description

Depending on the source group, different LCR routes can be selected without, for instance, rendering a special LCOSx assignment necessary. This allows not only the routing to be designed on a node-dependent basis, but also to be broken down even further (e.g. distinction according to shelf). The LCR routes belonging to a source group are defined in a table with the AMO LPROF. In AMO LDPLN, it is then possible to refer to such a table with the parameter PROFIDX. If an index entry exists in the digit pattern (in AMO LDPLN), the table administrated by AMO LPROF is branched too, and concurrence of the specified source group with the table values checked. If a matching entry is found, the further path selection is realized on the basis of the LTRE specified therein, otherwise, the LROUTE originally entered in AMO LDPLN is further used for path selection.

5.16.15.2 Service Information

- A source group can be explicitly assigned to a "Calling Party" (e.g. with AMO SDAT) or, as standard, derived from the slot (in shelf, AMO UCSU).
- In the table administrated by AMO LPROF, the same LROUTE entry can be specified as the LROUTE already defined for the digit pattern in AMO LDPLN.

- In AMO LPROF, only valid, i.e. existing, LRTE's can be entered.

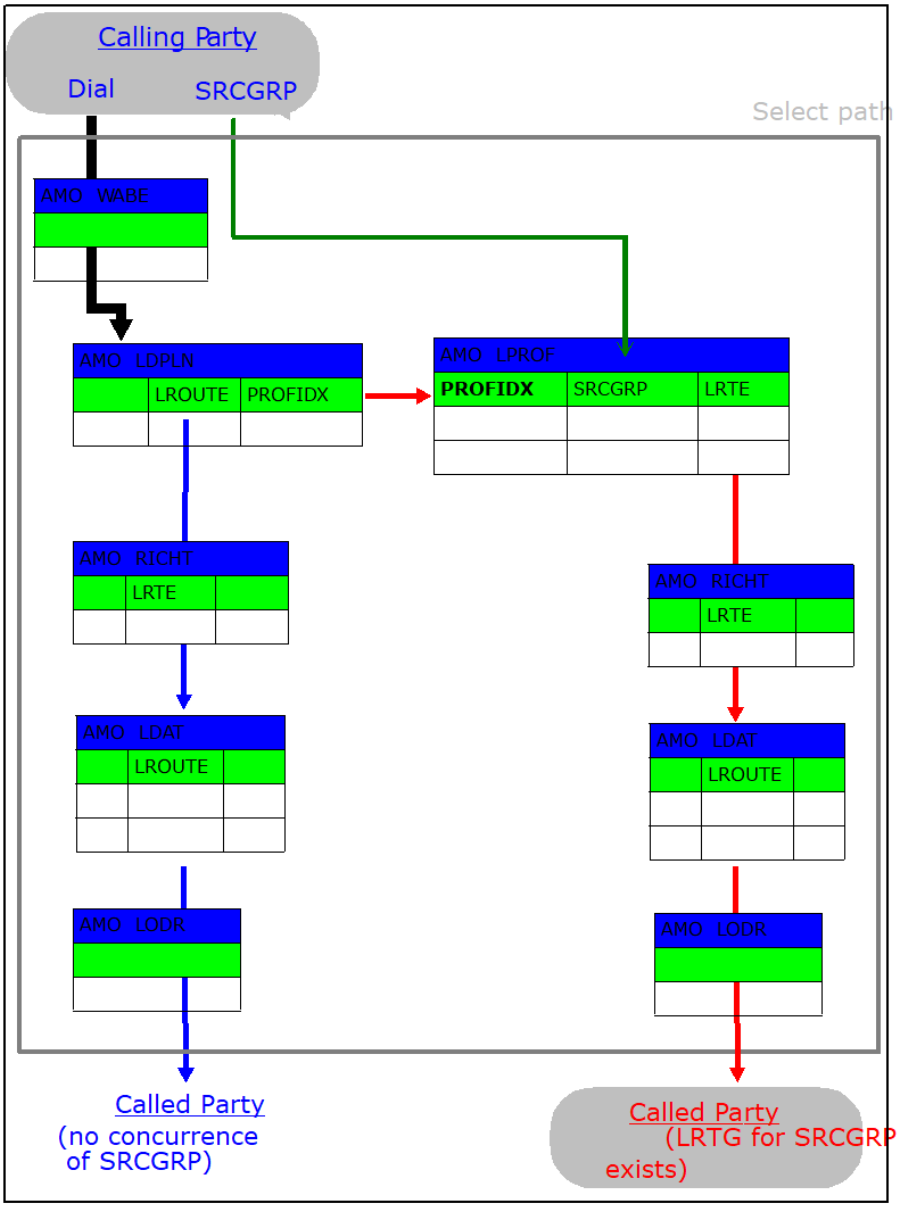


Figure 37: Procedure of a Source Group-Dependent Call Setup

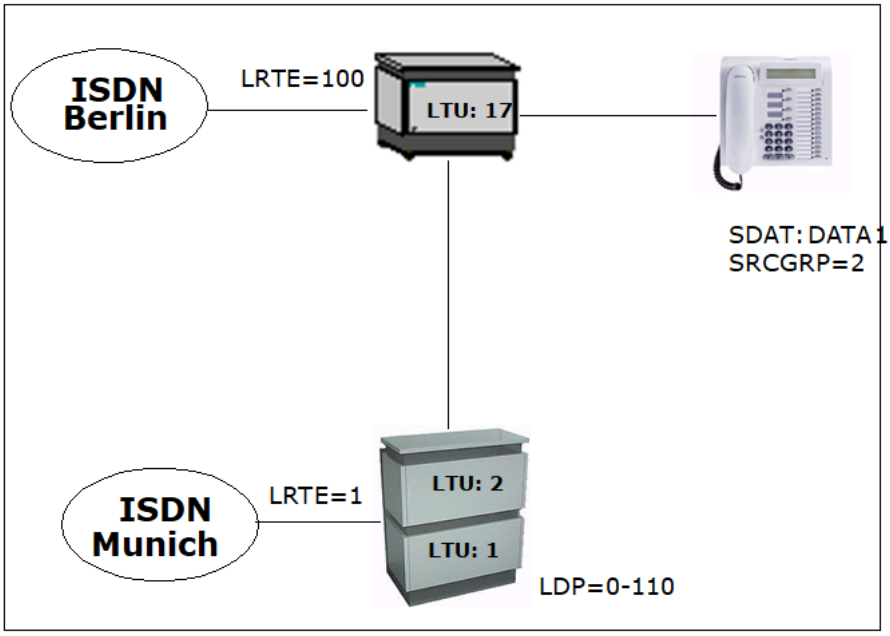


Figure 38: Example of a Source Group-Dependent Call Setup

5.16.15.3 Generation (Example)

- Setup LTU 17 with Source Group 2:

  ```
  ADD-
  UCSU:UNIT=AP,LTU=17,SRCGRP=2,FRMTYPE=INCH19,CONNTYPE=NBCSIPDL,
  LOCATION="TESTLAB";
  ```

- or setup STN in LTU 17 with Source Group 2:

  ```
  CHANGE-SDAT:STNO=7140, TYPE=DATA1,SRCGRP=2;
  ```

- Definition of LCR route 100 (route for outbreak "ISDN Berlin") for Source Group 2 with AMO LPROF:

  ```
  ADD-LPROF:PROFNAME="EMERGENCY",SRCGRP=2,LRTE=100;
  ```

- Reference to a source group table entry (here: Index 1) with AMO LDPLN:

  ```
  ADD-LDPLN:LDP=0-110,LAUTH=1,LROUTE=1,PROFIDX=1;
  ```

5.16.15.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
UCSU	SRCGRP	d	Source-Gruppen Index
	SRCGRP	e	Sourcegroup index
	INCH19	d	19 zoll - rahmen fuer ap shelfs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	INCH19	e	19 inch frame for ap shelves
	NBCSIPDL	d	ap shelf verbunden via ip - direct link
	NBCSIPDL	e	ap shelf connected via ip - direct link
	NBCSIPNW	d	ap shelf verbunden via ip netzwerk
	NBCSIPNW	e	ap shelf connected via IP net
LPROF	PROFIDX	d	LCR Profil-Index
	PROFIDX	e	LCR Profil-Index
	SRCGRP	d	Source-Gruppen Index
	SRCGRP	e	Sourcegroup index
	PROFNAME	d	LCR Profillname
	PROFNAME	e	LCR Profile name
	LRTG	d	LCR Richtung
	LRTE	e	LCR Route
LDPLN	LWM	d	LCR Wählmuster
	LDP	e	LCR digit pattern
	LBER	d	LCR Berechtigung
	LAUTH	e	LCR authorization level
	LRTG	d	LCR Richtungsnummer
	LROUTE	e	LCR Route number
	PROFIDX	d	LCR Profile Index
	PROFIDX	e	LCR Profile Index
SDAT	TYP	d	DATEN1
	TYPE	e	data1
	SRCGRP	d	quell gruppen index
	SRCGRP	e	source group index

5.16.16 LCR Dial Rules (AMO LODR)

5.16.16.1 Feature Description

In order to control outpulsing, assign each route element a dial rule. A dial rule (ODR) is a batch comprising one or more dial rule commands. The ODR's created with the AMO LODR are needed in the case of AMO LDAT, with the parameter ODR representing the link between these in this context. An ODR comprises consecutive, individual LCR dial rule elements (CMD) and is terminated with the CMD END.

5.16.16.2 Service Information

Dial rule commands:			
OUTPULSE	<ziffern>	Transmission of <digits>	
PAUSE	<n sec.>	Interrupt outpulsing for n sec.	
WAITANS	<n sec.>	Wait for 2nd dial tone	
OUTCOEX	<coex>	Class of external	
OUTCSN	<index>	Transmission of the call serial number	
OUTCODE	<index>	Transmission of an authorization Code	
...		...	
ECHO	<field>	Transmission of field <field> of the dialing plan	
ECHOALL		Transmission of the remaining digits	
END		End of the command batch.	

You thus specify the digits to be transmitted for an LCR route and their order, as well as the format.

5.16.16.3 Generation (Example)

Instead of the dialed digit pattern 0-030-4711, 010330304711 is to be transmitted on the line.

- Definition of the dial rule with AMO LODR

```
ADD-LODR:ODR=10,INFO="WITH CALL BY CALL 01033";

ADD-LODR:ODR=10,CMD=OUTPULSE,DGTS=01033;

ADD-LODR:ODR=10,CMD=ECHO,FIELD=3;

ADD-LODR:ODR=10,CMD=ECHOALL;

ADD-LODR:ODR=10,CMD=END;
```

- Assignment of the dial rule generated to a route with AMO LDAT parameter ODR:
  `ADD-LDAT:LROUTE=1,LSVC=VCE,LVAL=1,TGRP=2,ODR=10,LAUTH=1;`

5.16.16.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
LODR	INFO	d	Service Informationen
	INFO	e	Service Informations
	LWREL	d	LCR-Wahlregel-Element
	CMD	e	Out Dial Rule Command
LDAT	LRTG	d	LCR-Richtungsnummer
	LROUTE	e	LCR route number
	LDIENST	d	LCR Dienst
	LSVC	e	LCR Service indicator
	BUNUM	d	Nummer des Buendels
	TGRP	e	Trunk group number
	LWR	d	LCR-WahlregelNummer
	ODR	e	LCR Out Dial Rule Number

5.16.17 LCR Traffic Dependant (Line Reservation AMO BUEND)

5.16.17.1 Feature Description

The reservation of circuits for traffic dependent dynamic routing (seizing B-channels for direct connections) can be activated or deactivated per trunk group with the AMO BUEND. This results in the threshold value, i.e. the minimum number of free B-channels as of which the trunk group can be used as an alternative route in the path selection, being automatically computed and stored pursuant to the number of configured (n) B-channels in the trunk group according to $(\sqrt{n})$.

Table 8: Threshold Value as a Function of the Number of Configured Circuits

Number of configured circuits	Threshold value	Number of configured circuits	Threshold value
1	1[12]	529 - 624	12
2 - 8	1	625 - 728	13
9 - 24	2	729 - 840	14
25 - 48	3	841 - 960	15
49 - 80	4	961 - 1088	16
81 - 120	5	1089 - 1224	17
121 - 168	6	1225 - 1368	18
169 - 224	7	1369 - 1520	19
225 - 288	8	1521 - 1680	20
289 - 360	9	1681 - 1848	21
361 - 440	10	1849 - 2000[13]	22
441 - 528	11		

In order to distinguish between direct connection and alternative connections, the alternative paths of a route must be labelled. This is realized by setting the attribute ALTTGR ("variable trunk group") in AMO LDAT for the respective LCR route elements which serve as alternative paths.

This can prevent direct connections no longer being possible via a trunk group (e.g. Trunk Group No. 30, i.e. Connection AC as depicted in diagram below), as this connection is seized upon overflow of Route AB. A so-called overflow or a call setup via an alternative route element can then only take place if more channels are still free than the reservation threshold value specifies.

12 Special case: trunk group with one circuit - no rerouting possible.

13 Max. number of circuits per trunk group

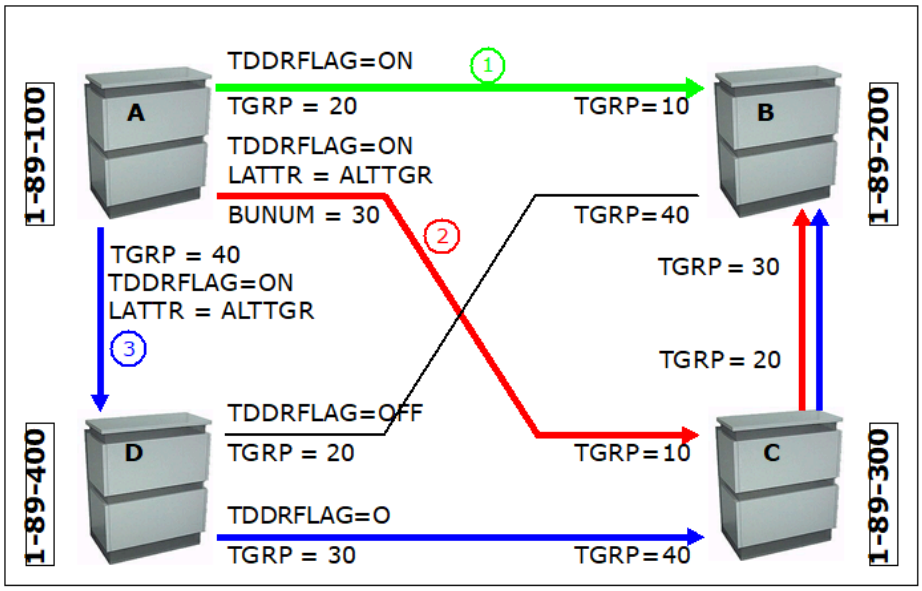


Figure 39: Traffic Dependent Routing

5.16.17.2 Service Information

- The number of channels that remain reserved for direct connections is stipulated pursuant to ITU-T E.412 and cannot be altered through an explicit parameter, but only implicitly via the number of configured circuits of a trunk group.
- The parameter TDDRFLAG is always set to ON as the default value when setting up a new trunk group.
- This function is service-independent and applies both to analog and digital channels.
- The number of reserved channels can be queried by means of AMO BUEND.
- For the special case of a single configured circuit, the parameter TDDRFLAG=OFF should be set.
- If, during path selection, a route is selected in which the attribute ALTTGR is active, this property is transmitted to the network (e.g. with Cornet Protocol) and also taken into account in subsequent path selections in the network.

5.16.17.3 Generation (Example)

Changing the existing LCR in Network Node A in order to activate the feature.

- Preparation of the existing trunk group (20) for taking traffic dependent routing into account in Network Node A with AMO BUEND:
  `CHANGE-BUEND:TGRP=20,TDDRFLAG=ON;`
- Labeling the 3rd route (Route 200 to Node B) as a "variable trunk group" with AMO LDAT:
  `CHANGE-LDAT:LRTG=200,LRTEL=3,LATTR=ALTTGR;`

5.16.17.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
BUEND	BUNUM	d	Bündelnummer
	TGRP	e	Trunk group number
	TDDRFLAG	d	belastungsabhaengiges Dynamic Routing Flag
	TDDRFLAG	e	traffic dependent dynamic routing flag
LDAT	LRTG	d	LCR-Richtungsnummer
	LROUTE	e	LCR route number
	LRTGEL	d	LCR-Richtungselement nummer
	LRTEL	e	LCR route element number
	LATTR	d	LCR-Attribut
	LATTR	e	LCR attribute

5.16.18 Inserting/Removing in a Queue (AMO LDAT)

The term queuing incorporates inserting/removing assignment requests for lines in a queue (trunk/direction).

The term queuing can be described as follows:

- waiting in the Route Advance Delay queue
- waiting in the OFF-hook queue
- waiting in the ON-hook queue

A call can be inserted/removed from a queue in the following two cases:

1) If the LVAL of all trunk groups is identical and no B channel is found in any of the trunk groups, OFF-Hook Queuing (B) is executed directly.

2) The trunk groups are prioritized. The call is initially queued via the Route Advance Delay (A) feature. If, however, no B channel is found in the highest prioritized trunk group, OFF-Hook Queuing (B) is executed

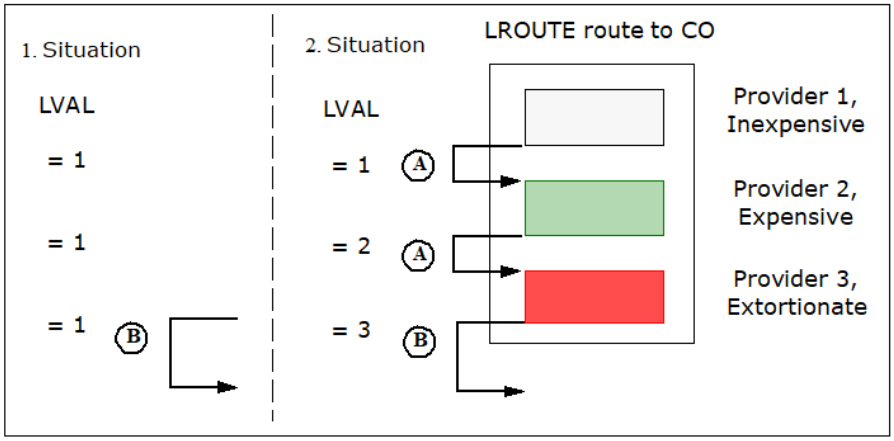


Figure 40: Inserting/removing according to LVAL

Removing calls: If a B channel is free, this is made available to the call already inserted. In this context, the queue (A,B) in which the call is located is irrelevant; assignment of the B channel is based on the prioritization of the inserted call.

The following prioritization applies in this context:

Table 9: (The priority with the highest value is assigned first)

Prio	Designation
0	Insert station in ON-hook queue
1	Insert station in route ADV queue
2	Station
3	Insert station in OFF-hook queue
4	Attendant console
5	Multy level pre-preemption
6	Emergency

5.16.18.1 Interrupting B Channel Search with Route Advance Delay

5.16.18.1.1 Feature Description

The Route Advance Delay feature allows the search for an available trunk to be interrupted for a set time. After this time has elapsed, a more expensive trunk is searched for. However, if a cheaper trunk (1) becomes available within this time, the time is stopped and the relevant trunk group is assigned. If the search for a B channel is interrupted and if the delay timer is greater than two seconds, this will be signalled to the user by a short tone. It is therefore possible for the user to search in a cheaper trunk.

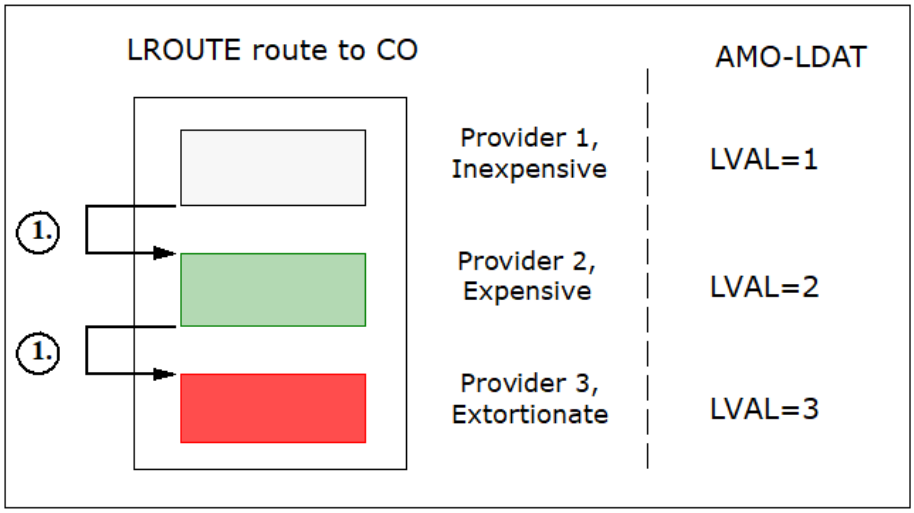


Figure 41: Queuing with cn Route Advance Delay

5.16.18.1.2 User Interface

The only signal is the Route Advance Delay tone. This tone is only sounds if the timer for the delay reads is greater than two seconds.

5.16.18.1.3 Service Information

- If calls have the same priority, the FIFO principle applies.

Restrictions for insertion/removal from the queue:

- As lines can only be switched if they are actually available, the feature (insert in queue) is not available to the AC.
- Direct Call Park/Call Forwarding No Replay (CFNR) and insertion into the queue is not possible.
- As regards the DB, Route Advance Delay is assigned to the callbacks.
- The parameters LVAL of the trunk groups in AMO LDAT must have different priorities. If all LVAL's have the same priorities, the next trunk group is switched to directly, as before.
- The Route Advance Delay tone can be separately activated
- The Route Advance Delay feature is only active if the value of the RTAD timer is set at > 0 seconds in the AMO CTIME. The default RTAD timer value is 0 seconds. This means that the feature is deactivated.

5.16.18.1.4 Generation (Example)

- Dimensioning the callback buffer:
  `ADD-DIMSU:TYPE=USER,CBK=40;`
- Prioritizing the trunk groups, example for TGRP 51,52,53:

```
ADD-LDAT:LROUTE=400,LSVC=ALL,LVAL=1,TGRP=51,ODR=4,
LAUTH=1,CARRIER=1,ZONE=EMPTY;

ADD-LDAT:LROUTE=95,LSVC=ALL,LVAL=2,TGRP=52,ODR=4,
LAUTH=1,CARRIER=1,ZONE=EMPTY;

ADD-LDAT:LROUTE=95,LSVC=ALL,LVAL=3,TGRP=53,ODR=4,
LAUTH=1,CARRIER=1,ZONE=EMPTY;
```

- Activate Route Advance Delay Tone:

```
CHANGE-COSSU:TYPE=LCOSV,LCOSS=1,ALCROPT=RTADT;
```

- Administrate length of the Route Advance Delay, 6 seconds:
  ```
  CHANGE-CTIME:TYPESWU=CP2,RTAD=6;
  ```
- Release Route Advance Delay Tone and assign SIU Tone:

  ```
  CHA-ZAND:TYPE=DATA2,ROUTTONE=YES;

  CHANGE-ZAND:TYPE=TONES,CPCALL=RTCHKNTF,SIU="2";
  ```

5.16.18.1.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
CTIME	ARTSWU	d	Verzweigungsparameter
	TYPESWU	e	desired timer category
	RTAD	d	Überwachungszeit fur Gültigkeit der LCR Route
	RTAD	e	time for validation of LCR route advanced
COSSU	TYP	d	Verzweigungsparameter
	TYPE	e	Desired cossu option
	LCOSS	d	LCR-Class-of-Service Nummer fuer Sprache (FAX)
	LCOSV	e	LCR class of service number for voice (FAX)
	ELCROPT	d	Einfügen LCR-Optionen
	ALCROPT	e	Add LCR options
DIMSU	RR	d	Dimensionierung der Rückruf Buffer
	CBK	e	no. of dynamically assignable pool elements for callback
LDAT	LRTG	d	LCR-Richtungs Nummer
	LROUTE	e	LCR Route number
	LDIENST	d	LCR Dienst
	LSVC	e	LCR Service indicator
	BUNUM	d	Nummer des Buendels
	TGRP	e	Trunk group number
	LWR	d	LCR - Wahlregel Nummer
	ODR	e	LCR Out dial rule number

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	LWERT	d	Wertigkeit des Richtungselements
	LVAL	e	priority of route element
	LBER	d	erforderliche LCR-Berechtigung
	LAUTH	e	required lcr authorization
ZAND	TYP	d	Auswahl des Datentyps
	TYPE	e	Desired system option
	CPTON	d	Vermittlungstechnischer Ton
	CP	e	Call processing tone
	SIUTON	d	Zugeordneter Ton der SIU
	SIU	e	Assigned siu tones
	ROUTTON	d	Aktivieren des Routing Ton
	ROUTTONE	e	Activate connect routing tone

5.16.18.2 Off-Hook Queue

5.16.18.2.1 Feature Description

A call is queued off-hook if no B channel is free in any of the trunk groups. This results in a B channel being reserved for the station. An Off-Hook queue can likewise take place in a transit station (Node 1-89-200). If a B channel becomes free, this is assigned to the queued call/circuit with the highest priority.

If a direction (AMO LDAT) has been assigned to the parameter LATTR with the parameter value OHKQ, the call is inserted into the off-hook queue.

In the transit case, the LCOSV of the station must additionally be assigned the parameter value OHKQT, and the COT of the incoming circuit the parameter value OHKQ.

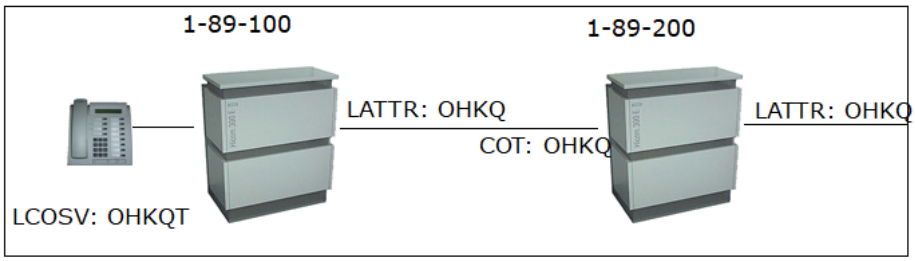


Figure 42: Off-Hook Queuing

5.16.18.2.2 User Interface

The station receives no specific signaling.

5.16.18.2.3 Service Information

- As regards the DB, off-Hook Queuing is assigned to the callbacks.
- In the transit case, the parameter value OHKQT must be set in the COT of the incoming transit circuit.
- The LCOSV must be assigned OHKQ, with OHKQT also being necessary in transit cases.
- In AMO LDAT, the parameter value OHKQ must be assigned in LATTR.

5.16.18.2.4 Generation (Example)

- Dimensioning the callback buffer:
  `ADD-DIMSU:TYPE=USER,CBK=40;`
- Setup a route (here: to Node 1-89-200) for off-hook queuing:
  `ADD-LDAT:LROUTE=200,LSVC=ALL,LVAL=1,TGRP=20,ODR=1,LAUTH=1,LATTR=OHKQ;`
- Release off-hook queuing with a transit case for LCOSV:
  `CHANGE-COS:TYPE=LCOSV, LCOS=7,ALCROPT=OHKQ&OHKQT;`
- Release the COT Off-Hook Queuing for a transit case:
  `ADD-COT:COTNO=2,PAR=OHKQ;`

5.16.18.2.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COSSU	TYP	d	Verzweigungsparameter
	TYPE	e	Desired cossu option
	LCOSS	d	LCR-Class-of-Service Nummer fuer Sprache (FAX)
	LCOSV	e	LCR class of service number for voice (FAX)
	LCOSD	d	LCR-Class-of-Service Nummer fuer Daten (DEE)
	LCOSD	e	LCR class of service for data (dte)
	ELCROPT	d	Einfügen LCR-Optionen
	ALCROPT	e	Add LCR options
COT	COTNU	d	Class of Trunk (Nummer)
	COTNO	e	Class of Trunk
	COTPAR	d	Parameterwerte für eine Class of Trunk
	PAR	e	Parameter values of a Class of Trunk
DIMSU	RR	d	Dimensionierung der Rückruf Buffer
	CBK	e	no. of dynamically assignable pool elements for callback

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
LDAT	LRTG	d	LCR-Richtungs Nummer
	LROUTE	e	LCR Route number
	LDIENST	d	LCR Dienst
	LSVC	e	LCR Service indicator
	BUNUM	d	Nummer des Buendels
	TGRP	e	Trunk group number
	LWR	d	LCR - Wahlregel Nummer
	ODR	e	LCR Out dial rule number
	LWERT	d	Wertigkeit des Richtungselements
	LVAL	e	priority of route element
	LBER	d	erforderliche LCR-Berechtigung
	LAUTH	e	required lcr authorization
	LATTR	d	LCR-Attribut
	LATTR	e	LCR attribute

5.16.18.3 ON-hook Queue

5.16.18.3.1 Feature Description

If there is no free B channel in all the trunks, this is signalized to the user by a second acknowledgment tone, so that he can then insert the call into the ON-hook queue. This way a B channel is reserved for the user. If a B channel is available, this is assigned to the highest priority inserted call/unit.

If a direction (AMO LDAT) is assigned the parameter LATTR with the parameter value ONKQ, the call is inserted into the ON-hook queue.

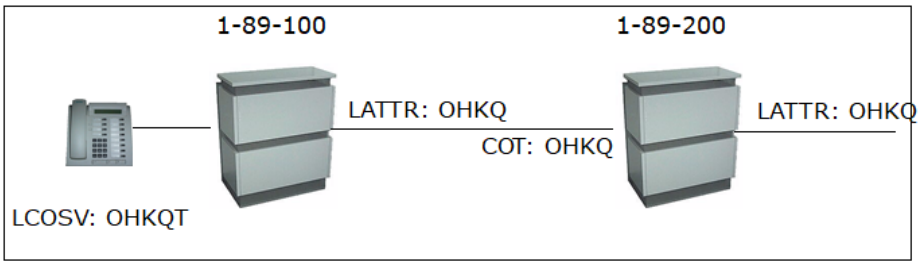


Figure 43: On-hook Queuing

5.16.18.3.2 User Interface

A second acknowledgment tone signalizes to the user that the function for inserting a call into the ON-hook queue can be activated.

Activation:

- Opti-Point

  By confirming the menu "call back", insertion into the ON-hook queue is activated.
- Anate

  By confirming the "flash key" and suffix dialing of the digit analysis result ACBK, insertion into the ON-hook queue is activated.

5.16.18.3.3 Service Information

- As regards the DB, the ON-hook queue is assigned to the callbacks.
- The LCOSV must be assigned to ONKQ.
- The parameter value ONKQ in the LATTR must be assigned in the AMO LDAT.

5.16.18.3.4 Generation (Example)

- Dimensioning the callback buffer:
  ```
  ADD-DIMSU:TYPE=USER,CBK=40;
  ```
- Set up a route for the on-hook queue:
  ```
  ADD-
  LDAT:LROUTE=200,LSVC=ALL,LVAL=1,TGRP=20,LVAL=1,LAUTH=1,
  LATTR=ONKQ;
  ```
- Release on-hook queue with a transit case for LCOSV:
  ```
  CHANGE-COSSU:TYPE=LCOSV, LCOSV=7,ALCROPT=ONKQ;
  ```

5.16.18.3.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COSSU	TYP	d	Verzweigungsparameter
	TYPE	e	Desired cossu option
	LCOSS	d	LCR-Class-of-Service Nummer fuer Sprache (FAX)
	LCOSV	e	LCR class of service number for voice (FAX)
	LCOSD	d	LCR-Class-of-Service Nummer fuer Daten (DEE)
	LCOSD	e	LCR class of service for data (dte)
	ELCROPT	d	Einfügen LCR-Optionen
	ALCROPT	e	Add LCR options
COT	COTNU	d	Class of Trunk (Nummer)
	COTNO	e	Class of Trunk

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	COTPAR	d	Parameterwerte für eine Class of Trunk
	PAR	e	Parameter values of a Class of Trunk
DIMSU	RR	d	Dimensionierung der Rückruf Buffer
	CBK	e	no. of dynamically assignable pool elements for callback
LDAT	LRTG	d	LCR-Richtungs Nummer
	LROUTE	e	LCR Route number
	LDIENST	d	LCR Dienst
	LSVC	e	LCR Service indicator
	BUNUM	d	Nummer des Buendels
	TGRP	e	Trunk group number
	LWR	d	LCR - Wahlregel Nummer
	ODR	e	LCR Out dial rule number
	LWERT	d	Wertigkeit des Richtungselements
	LVAL	e	priority of route element
	LBER	d	erforderliche LCR-Berechtigung
	LAUTH	e	required lcr authorization
	LATTR	d	LCR-Attribut
	LATTR	e	LCR attribute

5.16.19 LCR Generation

In order to be able to setup LCR, the generation sequence must be complied with.

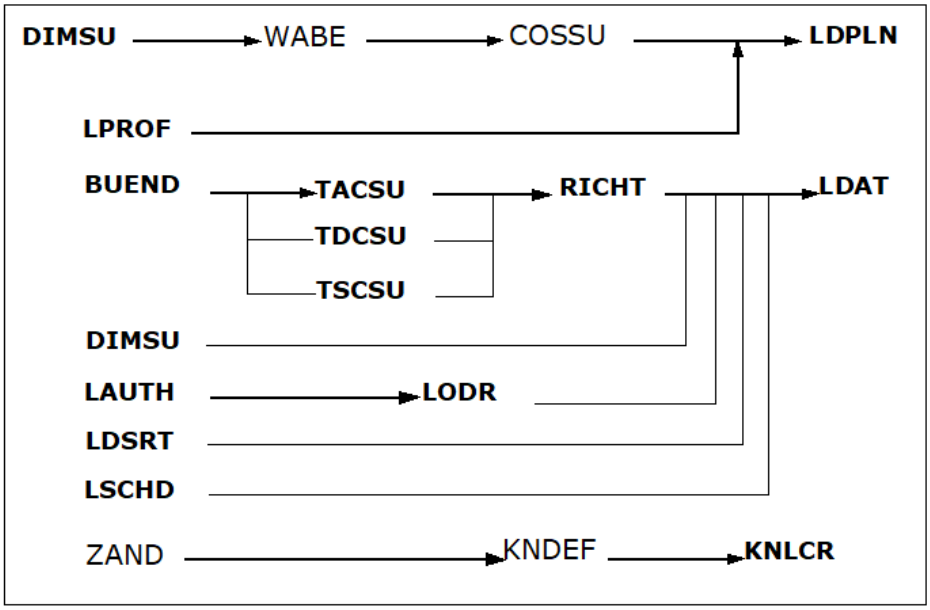


Figure 44: Generierungsablauf LCR

5.17 LCR Rerouting

5.17.1 Internal Rerouting Disabled

This SIS is used on DX when a network is created such that there are nodes with only 1 route out to a particular destination.In this situation congestion is unavoidable, and so in order to stop the situation where the call drops back and the node tries a different route, which will inevitably lead to the same point of congestion, IRD is used. This is administered on a network basis.

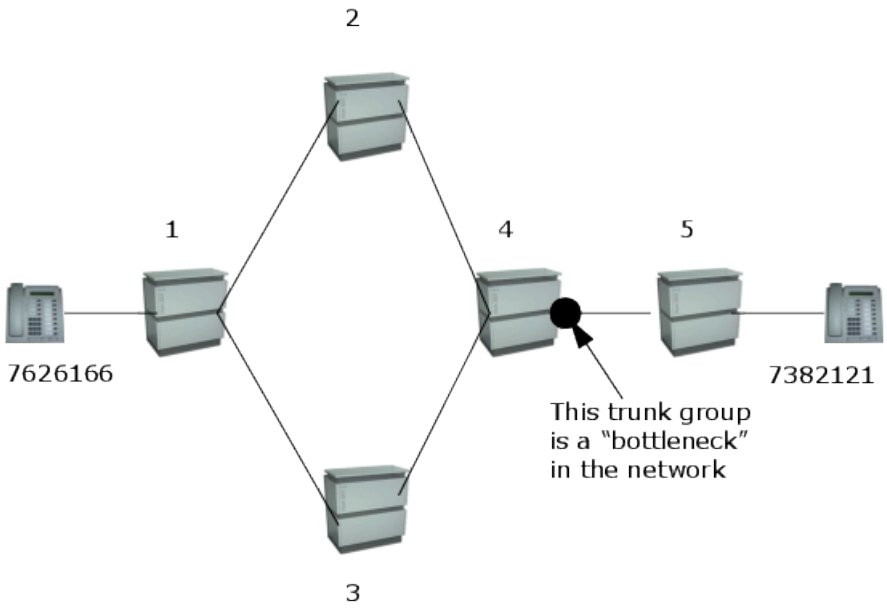


Figure 45: Network with Internal routes only

If a point of congestion is encountered in the network then IRD flag is sent backwards.

In Figure 47 there is a possible point of congestion between nodes 4 and 5. Without the Internal rerouting Disable being set a call from Node 1 to Node 5 would route initially to node 4 via Node 2. A Disc message would be sent back from Node 4 with the cause No Route to Dest.

The LCR in Node 1 would then choose the alternate route via Node 3 but with the same result a Disc with the same clearing code.

This can lead to a dynamic loading of the network To overcome this the IRD feature is to be used. In this case the clearing message is accompanied by a further flag which says no internal rerouting is enabled

This is done in the route element leading to the congested route

```
ADD-LDAT:LROUTE=xx,LSVC=ALL,TGRP=xx,ODR=xx,LAUTH=xx,
LATTR=INTBNECK;
```

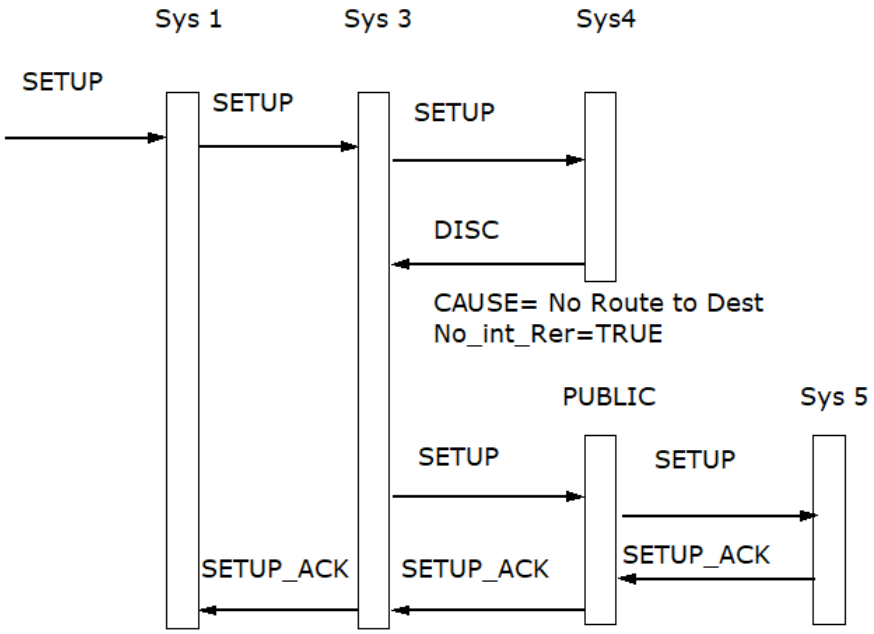
When a LROUTE ends in a bottleneck of the net, all trunk groups to this LROUTE have to be marked with the attribute "INTBNECK".

In the following figure LCR searches for a new route. In the database it is verified whether the new route leads to a Foreign network or not. This is marked in the COT of the trunk

```
CHANGE-COT:COTNO=xx,COTTYPE=COTADD,PAR=NTBO;
```

The system administrator knows the network boundary of the private network and can set the COT parameter "NTBO" where it's necessary, and if it not then the call is disconnected.

In the following figure the call would route out to the public network at sys 3 as the route is marked as a network boundary (this assumes the route is in the LDAT for this call).



On receipt of the DISC message Sys 3 would reroute only if the chosen route is marked as a network boundary i.e COT parameter NTBO is set

5.17.2 External Rerouting Disabled

External rerouting by to the public or Foreign networks may want to be disabled througout the network there by giving the originating system control

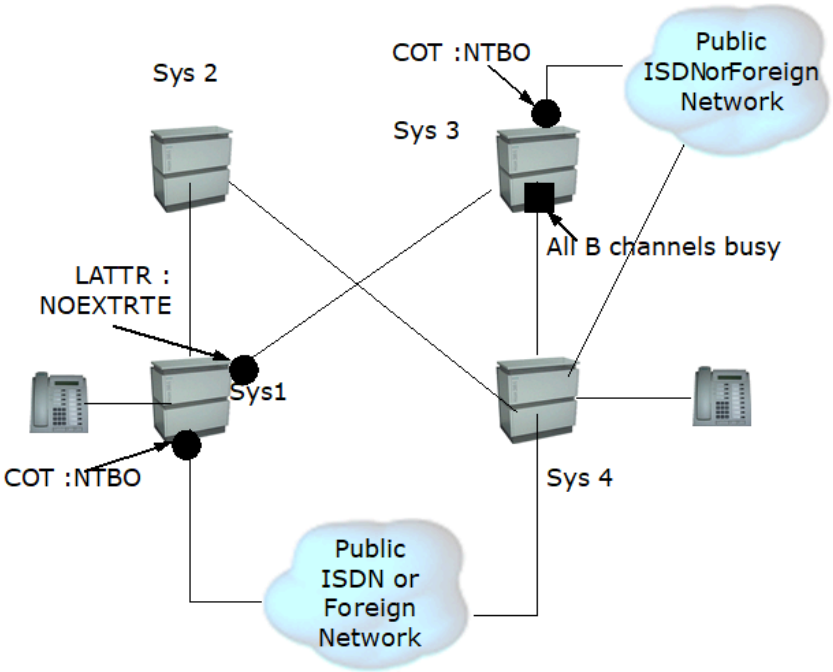


Figure 46: External Rerouting Disabled

When a system wants to decide for itself if it is possible to route to a foreign network the LDAT attribute NOEXTRTE must be set in each specified element of the used routes.

In the example in Figure 48 a call is setup from system 1 to sys 4 and encounters congestion between system 3 and 4.The cot parameter NTBO is set in Public/Private route to the foreign network and normaly the call would reroute to this route from system3.

However system 1 wishes to use it's own connection to the external network (and then only if the route via system 2 is congested)and marks the outgoing setup message with the attribute No External Rerouting set by:

```
ADD-LDAT:LROUTE=xx,LSVC=ALL,TGRP=xx,ODR=xx,LAUTH=xx,
LATTR=NOEXTRTE;
```

5.18 MFC-R2 Signaling

After a general introduction, this chapter describes some tips and tricks for using MFC-R2 signaling. The system uses MFC-R2 signaling when setting up the connection. Because this was implemented in the DH-Länder (DS120Vx), the comments given in the main chapter "Country-Specific Connection Techniques With Analog Trunks" also applies.

5.18.1 Introduction to MFC-R2 Signaling

This section provides a short introduction to MFC-R2 register signaling according to CCITT. For detailed information, refer to CCITT Recommendation Q.440 or to the guidelines published by the individual administrative authorities.

The MFC register signals are exchanged between the registers of the originating and terminal exchanges (end-to-end) in compelled inband signaling. There is a distinction made between the two different signal directions: forward (originating exchange to terminal exchange) and backward signals (terminal exchange to originating exchange). They are used for exchanging information when setting up a connection.

The forward signals are the dialing information (digits), type and origin of the connection, and others. Each signal (1...15) consists of two frequencies (2 of 6). To differentiate between the directions, there is an upper frequency group (1380...1980 Hz, at intervals of 120Hz intervals) for the forward signals and a lower frequency group.

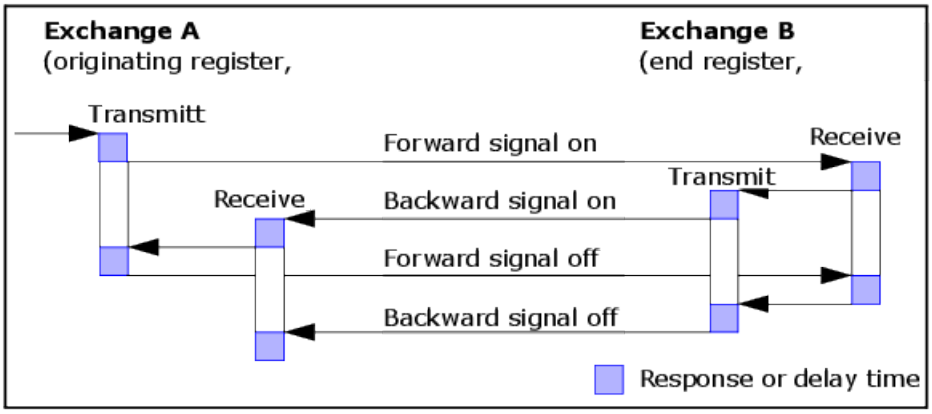
The backward signals are retrieval, status of the user connections, user class of service, and others. The backward signals use the lower frequency group (1140...540 Hz, at intervals of 120 Hz).

There are administrative authorities that use only the signals 1...10 for the PBX connections. This can save on configurations (2 of 5 instead of 2 of 6 code). The OpenScape 4000 SIU can always handle the entire range of signals (2 of 6). You can filter out signals 11 ... 15 by choosing the appropriate configurations (MFCTA, MFC conversion table).

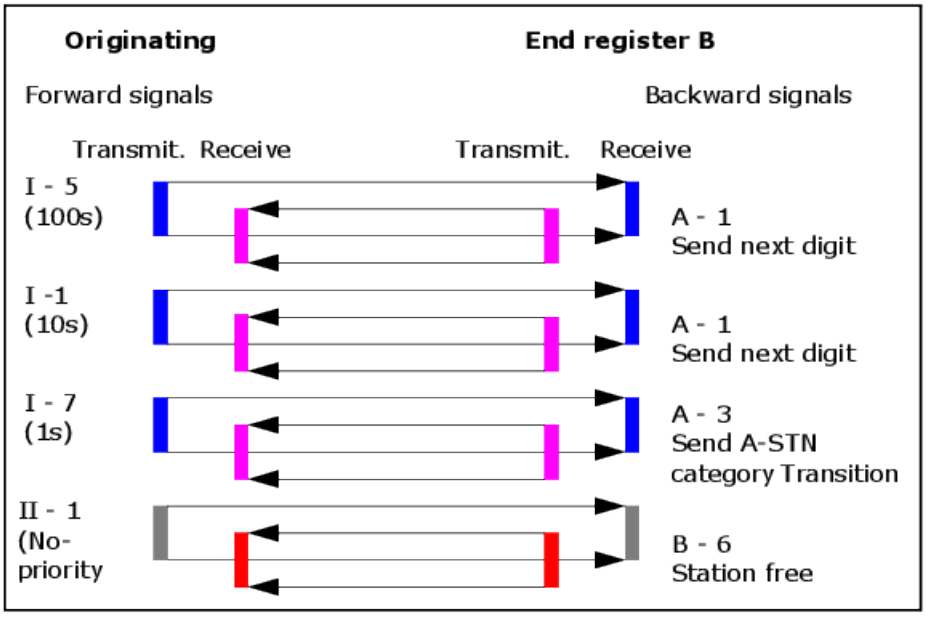
The introduction of MFC-R2 register signaling according to CCITT Q.440 also included the implementation of signaling according to SOCOTEL (for France) and IBERCOM (for Spain). These types of signaling are not discussed here.

5.18.1.1 Compelled Signaling According to MFC-R2

In this type of signaling, Exchange A sends each forward signal to Exchange B until the remote central office (exchange B) recognizes it and acknowledges it with a backward signal (from B to A). The exchange of signals always starts with the sending of a forward signal (signal offer). As soon as Exchange A detects the acknowledge signal, it deactivates the pending forward signal. As soon as Exchange B detects that the forward signal has been dropped, it deactivates the backward signal.



5.18.1.2 Example of a Connection Set-Up



The arrow diagram illustrated here shows the exchange of signals for a successful connection set-up to free station 517.

5.18.1.3 The Meaning of the MFC-R2 Signals According to UIT Q.441

The following table lists the meanings of the forward (Groups I and II) signals and the backward (Groups A and B) signals. This table is a compilation of the CCITT tables 6 to 9/Q.441.

Signa	Group I	Group II	Group A	Group B
1	Digit 1	STN without priority	Send next digit (n +1)	Spare for national use
2	Digit 2	Subscriber with priority	Send last but one digit (n-1)	Station number modified
3	Digit 3	Maintenance equipment	End-of-dial Reception of B signal	Station busy
4	Digit 4	Spare	Congestion	Congestion
5	Digit 5	Operator	Send calling party's category	Port not configured
6	Digit 6	Data transmission (national)	End-of-dial, set-up speech condition (with call charges)	Station free with call charges
7	Digit 7	STN or AC without forward transfer capability	Send last but two digit (n-2)	Station free without call charges
8	Digit 8	Data transmission (international)	Send last but three digit (n-3)	Station faulty
9	Digit 9	Priority STN (international)	Spare for national use	Spare for national use
10	Digit 10	Operator with forward transfer capability	Spare for national use	Spare for national use
11	Access to incoming operator (Code 11)	Spare for national use	Send country code	Spare for national use
12	a) Access to delay operator (Code 12) b) Request not accepted	Spare for national use	Send language or discriminating digit	Spare for national use

Signa	Group I	Group II	Group A	Group B
13	a) Access to test equipment b) Satellite link not included	Spare for national use	Send type of international R2 register	Spare for national use
14	a) Incoming half-echo suppressor required b) Satellite link included	Spare for national use	Is an incoming half-echo suppressor necessary?	Spare for national use
15	a) End of pulsing b) End of identification	Spare for national use	Internationally congested	Spare for national use

5.18.1.4 MFC-R2 Signals and MFCTA

The MFC tables control the signal exchange and the meaning of the forward and backward signals (physical-logical and reverse). Administer these with the AMO MFCTA.

You can see in the table that signals have been kept free for national use. Each country or provider uses these as needed. The terminal exchange often requires the A number (ANI;identification) from the originating exchange.

An SIU-X helps with the exchange of MFC signals.

5.18.2 Hardware

5.18.2.1 Circuits

MFC register signaling is possible for all devices (line circuit modules) that work with the DH-Länder (DS120). These can be both analog and digital circuits with CAS. Configure the "MFC-R2 Line Signalling digital version" described by CCITT Q.421 with the device (DEV=DIUCQ421).

Configuration example TACSU:

```
ADD-
TACSU:PEN=1-2-37-05,COTNO=222,COPNO=222,COS=220,LCOSV=1,
LCOSD=1,TGRP=222,CCT="A-ANALOG MFC",NNO=1-1-101,INS=Y,
DEVTYPE=TC,DEV=DIUCQ421,MFCVAR=2,CIRCIDX=22,DIALTYPE=MFC-
MFC;
```

5.18.2.2 SIU for MFC-R2

Depending on the configuration, you can set up a maximum of 8 MFC-R2 signal receivers and MFC signal transmitters on this. These always operate in pairs and the configuration is also always in pairs.

Because the signaling described in the preceding is based on the signal offer, more configurations are needed for outgoing traffic than for incoming traffic (in the example there are 2 incoming (backward) and 6 outgoing (forward) configurations):

```
ADD-BCSU:SIUP,1,2,49,"Q2233-X  ",
R2B&R2B&R2F&R2F&R2F&R2F&R2F&R2F,"0",3;
```

A virtual SIUX board provides MFC-R2 functionality for OpenScape 4000 SoftGate/OpenScape Access. The configuration for a virtual SIUX, for example, is

```
ADD-BCSU:MTYPE=SIUP,LTG=1,LTU=42,SLOT=10,PARTNO="Q2187-X ",
MFCTYPE=R2B&R2B&R2F&R2F&R2F&R2F&R2F&R2F,LWVAR=0,FCTID=3;
```

For detailed information, refer to the "OpenScape Access" service documentation.

5.18.2.3 Trunk - SIU Connection

As the general description clearly indicates, there must be an MFX-R2 transmitter/receiver pair assigned to a trunk during the exchange of signals. The configuration in TACSU is responsible for the correct connection: MFCVAR=x, DIALTYPE=MFC-MFC.

MFCVAR in this AMO corresponds to the MFCVAR in the AMO MFCTA (described later).

5.18.3 General Information on the MFC Tables

The OpenScape 4000 hard disk meanwhile has MFC tables for many countries and applications. You must modify these for the individual application. This is possible at any time. If you make the same modifications over and over, it would be useful to report this so that the base initialization can be adjusted. Display the list as follows:

```
DISPLAY-MFCTA: MFCVAR=1,TYPE=HD;
```

IMPORTANT: You can use Table 25 (CCITT Standard) as the generally valid base configuration. Configure SOCOTEL signaling with Table 3 and IBERCOM signaling with Table 4 or 10.

5.18.3.1 Identification With Master Number (Outgoing Seizure)

Instead of the station number, the master number is sent to the remote central office if:

- the station is blocked for direct inward dialing,
- the number is identified as 'Presentation restricted' (for example, a secret calling number),
- the A number is not available (for example, because of an analog network interface),
- the A number is identified as inadmissible (screening indicator: Screened but failed),
- the attendant console sets up the connection (does not apply to seizure of the line with the P aggregate).

You must configure the master number in MFCTA. If you have not configured a calling number, the central office acknowledges the A number request with the ID contents.

- Configure the master number as follows:

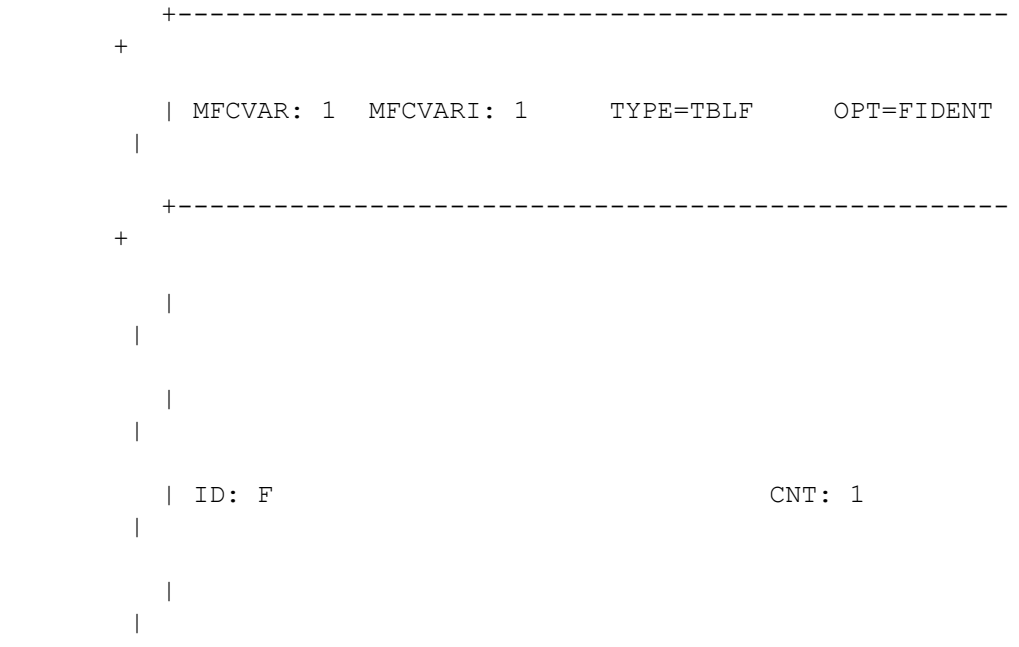
```
CHANGE-MFCTA:MFCVAR=x,TYPE=TBLF,OPT=FIDENT,
BSDIRNO=master-number;

CHANGE-MFCTA:MFCVAR=x,TYPE=TBLF,OPT=FIDENT,
BSDIRCNT=number-of-digits-in-master-number;
```

5.18.3.1.1 A Number Identification Examples (Generated, Outgoing Seizure)

To guarantee proper identification with MFC-R2 (ANI), you must enter a master number in the AMO MFCTA. Because the provided country tables apply for a country in general, you must configure them for each MFC type a system uses.

Here are a few application examples to illustrate the existing ANI capabilities:

- Example 1: ANI with master number for station as described above or extended with PABXID for the other stations ("normal" application) Internal calling number: 5017 (4-digit)
  - ANI block (station) sent to central office: 0585 585 017F
  - ANI block (master number) sent to central office:0585 585 585F



```
   | PABXID  : 058558                    PCNT: 6
|
   |
|
   | POS1:  0     POS2:  0     POS3:   0     POS4:  0
|
   |
|
   | ANBEG: 0     ANEND: 0    APOS:    0
|
   |
|
   | BSDIRNO:  0585585585                BSDIRCNT:  10
|
   |
|
   +-------------------------------------------------
+
```

- Example 2: ANI with master number for all stations Internal station number: 5017 (4-digit)
  - ANI block (station) sent to central office: 01 495 3111F
  - ANI block (master number) sent to central office: 01 495 3111F

```
   +-------------------------------------------------
+
   | MFCVAR: 1  MFCVARI: 1     TYPE=TBLF     OPT=VIDENT
|
   +-------------------------------------------------
+
   |
|
   |
|
   | ID: F                               CNT: 1
|
   |
|
   | PABXID  : 014953111                 PCNT: 9
|
```

```
   |
 |
   | POS1:  9     POS2:  0     POS3:  0     POS4:   0
 |
   |
 |
   | ANBEG:   9   ANEND:   9   APOS:    0
 |
   |
 |
   | BSDIRNO:  014953111                BSDIRCNT:  9
 |
   |
 |
   +-------------------------------------------------
+
```

- Example 3: ANI with master number (like in example 1) and modification of the highest-valued digit for other stations Internal station number: 5017 (4-digit), central office station number: 01 495 9017
  - ANI block (station) sent to central office: 01 495 9017F
  - ANI block (master number) sent to central office: 01 495 9111F

```
   +-------------------------------------------------
+
   | MFCVAR: 1  MFCVARI: 1     TYPE=TBLF     OPT=FIDENT
 |
   +-------------------------------------------------
+
   |
 |
   |
 |
   | ID: F                                  CNT: 1
 |
   |
 |
   | PABXID  : 014959                   PCNT: 6
 |
```

```
   |
 |
   | POS1:    0   POS2:    0   POS3:    0   POS4:    0
 |
   |
 |
   | ANBEG:   1   ANEND:   3   APOS:    0
 |
   |
 |
   | BSDIRNO:  014959111                BSDIRCNT:  9
 |
   |
 |
   +-------------------------------------------------
+
```

5.18.3.2 Counter When Retrieving the A-Number (Terminating Seizure)

There are countries that acknowledge each A-5 with the II signal (category). But it is assumed that the 1st A-5 acknowledges with the station category and that other A-5s acknowledge with the A number. To prevent endless loops in this (incorrect) case (identification sent with A-5 to I-15), you should limit the number of A-5s that are sent.

- Change the MFC table (MFCTA) as follows:
  `CHANGE-MFCTA:MFCVAR=x,TYPE=MFCVAR,OPT=SUPERV,MAXDGTS=15;`

> **IMPORTANT:** If you set MAXDGTS=0, there is no monitoring of the digit signals during identification. The number of signals is not explicitly monitored during a generated seizure. Therefore you must configure the table correctly (see above).

5.18.3.3 Identification With MFC-R2 (General)

The identification sequence according to PTT Basic Requirement 692.97 Issue VII.D was implemented for Switzerland. The A station retrieved by the central office is displayed on the digital station device if you have configured the appropriate classes of service.

Because the identification sequence increases the length of the seizure of the MFC equipment in the central office and in OpenScape 4000, you should only equip a few TVAs with the identification feature according to Section 5.4

of the mentioned PTT basic requirement. Therefore you should arrange the identification configuration in a system with the PTT.

This statement also basically applies to other countries.

The identification (A number) can be retrieved before and after the B number is received.

5.18.3.3.1 Generation Notes on A Station Identification (Before the B Number)

In this application, identification is performed on each incoming call. The advantage of this method is that the dangerous time between the "preliminary seizure" of the B station and ringing is short. The disadvantage of this method is that the SIU MFC devices for both the OpenScape 4000 and in the central office remain seized (considerably) longer for each seizure.

You should perform the following generations using MFCTA (MFC parameter: IDBEFBS) and FEASU so that the central office retrieves the A station number:

```
FEASU: TRACCO = YES

CHANGE-MFCTA:MFCVAR=x,TYPE=MFCVAR,OPT=MISC,
PAR=IDBEFBS;
```

IMPORTANT: In a concrete case, you must repeat and chain all parameters that have already been set with '&'. The above example only sets the parameter IDBEFBS.

5.18.3.3.2 Generation Notes on A Station Identification (After the B Number)

In this method, the A number is only retrieved if the reached station is correctly administered. The advantage is that calls do not use the SIU MFC devices longer than necessary. The disadvantage is that the time between "preliminary seizure" and ringing is considerably longer. If the B station picks up during this time, the call is signaled to the central office with "FREE" but the busy tone is applied.

To make sure that the A station number is retrieved from the central office, perform the following generations with COT, COSSU, and FEASU:

Identification without allowing the tracing expression:

- COSSU: Station COS with TSUID for retrieval of the A number when there is a call to the station.
- COT: ATDI for retrieval of the A number when there is a call to the AC (call queue).
- COT: TIEI for retrieval of the A number when there is a call via DAR TIE.
- FEASU: TRACCO = YES

Identification while allowing the tracing expression:

- COSSU: Station COS with TSUID and FANGAUT (if there is automatic tracing)
- FEASU: TRACCO = YES
- WABE: Digital analysis result TRACE (for manual tracing)

5.18.3.4 Use Identified Calling Number for Redial

The Swiss PTT network does not send the so-called network access digit (0) during identification (example: 14954444, 17491212, 216318888 or 31650333, where the remote code is shown in bold).

The feature has been extended so that the identified station number is supplemented according to the following rule:

- Starting digit sequence <> "xy" supplement calling number with "uw" (31650333 -> 0 031 650 333).

- Starting digit sequence = "xy" remove this digit sequence; supplement with "u" (14954444 -> 0 4954444)

Configure the remote code (starting digit sequence "xy"), the network access digit ("w"), and the trunk group code (breakout to central office "u") in the AMO MFCTA.

Example for network group 01 and trunk group code to central office 0: Display for 14954444: 04954444 / Display for 31650333: 0031650333:

CHANGE-MFCTA:MFCVAR=1,TYPE=MFCVAR,OPT=MISC,EXACFI=0; CHLCLTR=1, TRDISDI=0;

Example for network group 21 and trunk group code to central office 9: Display for 216318888: 96318888 / Display for 31650333: 9031650333:

CHANGE-MFCTA: MFCVAR=1, TYPE=MFCVAR, OPT=MISC, EXACFI=9; CHLCLTR=21, TRDISDI=0;

You can also use the above examples for other countries. You should also keep in mind the calling number modifications in the OpenScape 4000.

5.18.3.5 Acknowledged Identification Request (HUNGARY)

When there is an identification request (Hungary) with MFC-R2, first a signal is received that indicates whether the identification is valid or possible (acknowledge). This signal should not be sent on to the CP.

- Load the MFC Table 15 for Hungary (central office) with the following AMO command on MFC version x. The tables already have the correct basic initialization, so that the following MFCTA command to assign the parameters is not necessary. COPY-MFCTA: 15, x;
- You can control the feature described above with the MFC parameter CHKIDDGT:
  ```
  CHANGE-MFCTA: MFCVAR=x, TYPE=MFCVAR, OPT=MISC,
   PAR=CHKIDDGT.
  ```

IMPORTANT: In a concrete case, you must repeat and chain all parameters that have already been set with '&'. The above example only sets the parameter CHKIDDGT.

5.18.3.6 Handling the Signals in Generated Connections

Use the table (TYPE=TBLF,OPT=DIALOUT) in MFCTA to assign the dialed digits to any MFC signals that you choose. This table converts the dialed 0 to the MFC signal 10. This installation of this table is correct for most applications. It assigns all characters of a 16-key keyboard to an MFC signal.

- Changing the MFC tables to assign the MFC signal I-15 to the digit # (11).

```
CHANGE-MFCTA: MFCVAR=x, TYPE=TBLF, OPT=DIALOUT,
 PHYSIG=11,
SIGNAL=15, INFO=END;
```

5.18.3.7 Note on Message F5607 MFC-MONITORING

This (error) message contains various information:

Example for message F5607:

```
F5607 M4 N0203 NO ACT   BPA   CIRCUIT  MFC MONITORING          03-01-16 11:42:58
       ALARM CLASS:SWU-PER:013/000/001
         P102:LTG1 :LTU2 :037: 38    : 0 Q2196-X    DIU-N2/2   BST:01  PLS:-03
       FORMAT:22      DEVICE NAME:  DIUCQ421
       402C010010000000000010100000000  00000000000000000000000000000000
       00000002010101050000000000000000  0000000000000000000000B5050000
       15FFFFFFFFFFFFFFFFFFFFFFFFFFFFF  FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFF
```

Interpretation of the message contents:

1st line:

```
402C020010000000800001010001000O  00000000000000000000000000000000
aabbccddeeeeeeeeeeeeeffgghhiiiiii  iiiiiiiiiiiiiiiiiiiiiiiiiiiiii
```

2nd line

```
00000001000001000000000000000000  0000000000000000000000B8000000
iiiiiijjkkllmmmmmmmmmmmmmmmmmmmm  mmmmmmmmmmmmmmmmmmmmmmmmmmmnnnnnnnn
```

3rd line

```
0EFFFFFFFFFFFFFFFFFFFFFFFFFFFFF  FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
ooxxxxxxxxxxxxxx
```

aa	Message length H'40 = 64 relevant bytes
bb	Message code = DB_QF_E_CIR_MFC_UEBERW = MFC-Monitoring
cc	Situation (see below) here: 01 = No first signal
dd	Pending frequencies on the SIU (only for SIU developers)
ee	MFC attribute (only for DH developers)
ff	Forward signal input counter
gg	Forward signal output counter
hh	Forward signal retrieval pointer (not important)

ii	Forward signal
jj	Backward signal input counter
kk	Backward signal output counter
ll	Backward signal retrieval pointer
mm	Backward signal
nn	Device address of the connected SIU type 3
oo	DH status
xx	Data that is no longer important

The situation is stored in the 3rd byte (in this case 02). The following values are possible:

00	no SIU found
01	No first signal
02	No further signal
03	Pending signal does not deactivate
04	No control frequency (SOCOTEL/IBERCOM)
05	Control frequency does not deactivate
06	SIU does not answer message (request for pending frequencies)
07	Signal that is not allowed (NOPO in table
08	Forward signal not acknowledged (generated connection)
09	Forward signal not acknowledged (generated connection)
0A	COE error. Line has incorrect or missing class of externals assigned. The F5607 with situation 0A is also used for trunks without MFC-Table
0B	Implausible MFC signal start
0C	Implausible MFC signal end
0D	Implausible timer
0E	Test call 1
0F	Test call 2
10	Other situation (not assigned)
11	Test call 3

12	No SIU request message (MFRP)
13	Invalid SIU frequency (MFRP)
14	Unexpected 1st frequency (MFRP)
15	Incorrect program progress (MFRP)
16	Congestion signal (MFRP)
17	Long timer responds (terminating connection MFRP)
18	Long timer responds (generated connection MFRP)
19	Error during MFRP generated connection
1A	Codogram (not sended by ANIF / no receiver by ANIB)
1B	Error during MFRP generated connection
1C	Error during MFRP generated connection (not allowed parameter combination)
1D	Error during MFRP generated connection (no attribute set)
1E	Error during MFRP generated connection (unlogical parameters, attribute)
1F	end to end signalling
20	link-by-link Signalling (see)

5.18.3.7.1 F5607 MFC-MONITORING for all terminating connections

You can set the parameter MFCMO in MFCTA. The parameter NOMFCMO must not be set. With this combination of the parameters, each terminating connections generates a F5607 MFC-MONITORING.

This is implemented for testing cases. Here two examples:

```
F5607 M4 N0198 NO ACT   BPA   CIRCUIT  MFC MONITORING          03-01-16 08:50:29
       ALARM CLASS:SWU-PER:013/000/001
       P102:LTG1 :LTU2 :037: 37    : 0 Q2196-X    DIU-N2/2   BST:01  PLS:-03
       FORMAT:22      DEVICE NAME:  DIUCQ421
       402C2000C100020000000F0F00000301  050202030205070F0405070100000000
       0000000F02010105050505050505050505  0101010306000000000000000B4050000
       17FFFFFFFFFFFFFFFFFFFFFFFFFFFFFF  FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFF

F5607 M4 N0199 NO ACT   BPA   CIRCUIT  MFC MONITORING          03-01-16 11:11:35
       ALARM CLASS:SWU-PER:013/000/001
       P102:LTG1 :LTU2 :037: 38    : 0 Q2196-X    DIU-N2/2   BST:01  PLS:-03
       FORMAT:22      DEVICE NAME:  DIUCQ421
       402C20008100020000000F0F00000301  050202030205070F0406020100000000
       0000000F02010105050505050505050505  0101010305000000000000000B5050000
       17FFFFFFFFFFFFFFFFFFFFFFFFFFFFFF  FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFF
```

Interpretation of example one:

The decribed rules of the chapter above are valid. The ii-part shows the signals received from the originating register. The mm-part shows the signals send to the originating register.

```
ii: 03 01 05 02 02 03 02 05 07 0F 04 05 07 01
mm: 05 05 05 05 05 05 05 05 05 01 01 01 03 06
```

You see the signals by using ANI before the transmission of the B-number. For ANI is the A-5 used. First A-5 ask calling partys category.

A-Number: 5223257F; B-Number: 3457; calling partys category: II-1

The called party is free (B-6)

The second example shows nearly the same, but the called party (3462) is out of service (B-5).

5.18.3.8 Monitoring the MFC Signal Exchange

You can configure the monitoring timers in the branch TYPE=MFCVAR, OPT=TIME. To monitor from the signal start of the current digit to the signal start of the next digit, you must set the timers NXTSIG = 0 and RMVSIG > 0. If you set both values to 0, there is no monitoring. If you set both timers to a value > 0, NXTSIG waits for the next signal and RMVSIG waits until the remote exchange overrides the signal. Use STADIAL for applying the first signal from the remote central office.

If an MFC monitoring timer responds, the system generates an MFC-MONITORING message and ends the signal exchange with IMP (corresponding pulse signal from the MFC table TYPE=MFCVAR,OPT=MISC).

5.18.3.9 Dialing Monitoring Combined With Intercept to Attendant Console

MFC-R2 signaling allows you to send selected signals as pulses. You can configure two signals (MFCTA). The IMP signal (usually A-4) is sent as a pulse when the call encounters busy (no intercept) after the monitoring response (see above). The signal IMP2 (usually A-6) is sent as a pulse when the call encounters a free indication after the monitoring response. This case occurs when the call was intercepted to the attendant console.

- Change the MFC table (MFCTA) as follows:
  ```
  CHANGE-MFCTA: MFCVAR=x, TYPE=MFCVAR, OPT=MISC, IMP=4;

  CHANGE-MFCTA: MFCVAR=x, TYPE=MFCVAR, OPT=SUPERV, IMP2=6;
  ```

5.18.3.10 Tracing End-of-Dial Without Charges

In some countries (such as Brazil), it should be possible to trace an MFC end-of-dial without charges. (Extension of the possible B signals when calling an available user.)

If a user has both the trace class of service and the 'without taxation' class of service, use MFCTA as follows:

```
CHANGE-MFCTA: MFCVAR=x, TYPE=TBLB, OPT=BSIGB,
 EODTYPE=MCIDFC, BSIG=7;
```

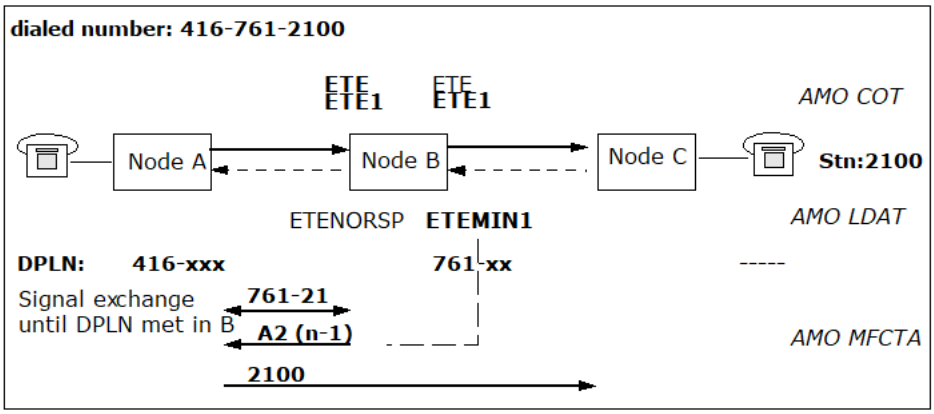
5.18.3.11 END TO END Connections

In end-to-end signal transmissions, the transit register and destination register correspond only to the originating register. Enough information is retrieved from the origin to allow the through-connection. In particular, the number of the B station is transmitted only once. This means that the connection set-up is faster than with a link-by-link transmission. The feature is only effective in transit systems but does not have to be administered throughout the network.

IMPORTANT: If you do not administer the END TO END feature, LINK BY LINK is set up. As a rule, the following applies: transmission is LINK BY LINK if the configuration is incorrect. CorNet links are inserted into the connection transparently and do not interfere with the END TO END set up.

Identification is possible only after the B station has been reached and depends on the classes of service there.

Example:



5.18.3.12 Configuration Notes

The data refers to an existing configuration with MFC or CorNet circuits on DIUC modules. Digit analysis results for tie or trunk calls are available, as are the numbering plans for the path selection. Activate the feature with the AMO COT. An END TO END connection is made when the ETE classes of the incoming and outgoing circuit are compatible, which means that both belong to the same ETE class and the signal exchange has been adapted to the existing numbering plan.

```
CHANGE-COT:210,COTADD,ETE&ETE1
```

IMPORTANT: If you have not set ETE on the incoming circuit, link by link is set up, but you can use the circuit for outgoing ETE if you have only set ETE1. You can assign more than one ETE class.

```
CHANGE-MFCTA:1,TBLB,BSIGA,2,ETEMIN1,END

CHANGE-MFCTA:1,TBLF,BSIGA,2,MIN1
```

IMPORTANT: MFC version and backward signaling depend on the country. ETEMIN1 or MIN1 are values for the BSIG and its interpretation for the ETEMIN1 end-of-dial (B station starting with the next to last digit)

```
CHANGE-LDAT:401,ALL,1,,401,10,1,,1,EMPTY,ETEMIN1,,NONE,1,4
```

IMPORTANT: You are only allowed to set one end-of-dial attribute. This depends on the numbering plan that is configured in the network. ETEMIN1 means that the B-station is requested starting with the next to last digit.

```
CHANGE-COP:XX,COPADD,STNI
```

IMPORTANT: Set the COP if you want to use an incoming circuit for identification for both types of set ups.

5.18.3.13 New User Categories for Private Networks (With MFC Signaling)

The new service for private networks from Ibercom allows users of distributed systems in a private network to communicate with one another under special conditions (charges) via the Ibercom network. Special MFC signals (group II) are used for 'private calls' (local, national, international).

Assign the category (or the II signal) with MFCTA. Define the class of service with COSSU. Use the LCR outdial rules to assign this COS (or COEX) to the dialed digits (local, national, or international).

- Load MFC Table 10 for Spain (IBERCOM 2 of 6) with the following AMO commands on MFC version x. The tables already have the correct basic initialization, so that the following MFCTA commands to assign the category are not necessary:
  ```
  COPY-MFCTA: 10, x;
  ```
- Assign the II signal (physical) to the category (logical) as follows:
  ```
  CHANGE-MFCTA: MFCVAR=x, TYPE=TBLF, OPT=VFGR2,
   FSIG2=LOCCLPR,
  CATEGORY=12, PHYSIG=11, IDX=3;

  CHANGE-MFCTA: MFCVAR=x, TYPE=TBLF, OPT=VFGR2,
   FSIG2=NATCLPR,
  CATEGORY=14, PHYSIG=13, IDX=3;
  ```

```
CHANGE-MFCTA: MFCVAR=x, TYPE=TBLF, OPT=VFGR2,
 FSIG2=INATCLPR,
CATEGORY=15, PHYSIG=6, IDX=0;
```

- Assign the COS parameter as follows:

```
CHANGE-COSSU:TYPE=COS,COS=x,AVCE=LOCC;

CHANGE-COSSU:TYPE=COS,COS=y,AVCE=TOLLPV;

CHANGE-COSSU:TYPE=COS,COS=z,AVCE=INATC;
```

5.18.3.14 Using the ITR (Internal Traffic Restriction Group) With MFC-R2

The MFC table is modified for the special networks of Hungary. This assigns an ITR to the Group II signal. Using the AMO VBZ, you can configure the appropriate restrictions. You can use this feature everywhere that you use MFC-R2. Because the ITR is transmitted in a OpenScape 4000/HiPath 4000 network, this feature is valid throughout the network.

Use the column "ADINFO" in the table TYPE=TBLB,OPT=FORIA (AMO MFCTA). This column is initialized to 0 for each pending signal. This guarantees that the new feature is normally not active. This value is also initialized in the AMO TACSU to ITR.

Configuration example for assigning ITR 5 to signal II-5 (mediator):

```
CHANGE-MFCTA: MFCVAR=x, TYPE=TBLB, OPT=FORIA, PHYSIG=5,
ADINFO=5;
```

5.19 National ISDN Basic Rate Interface (NI BRI)

5.19.1 Feature Description

The customer, as the end user, can access the OpenScape 4000 switching system with this feature by using the protocol and the procedures defined by Telcordia Technologies (previously Bellcore) for the NI BRI. Thus end users can initialize ISDN configurations and set up and release system-internal ISDN connections and ISDN users can communicate with existing networks.

Usually US customers use the NI BRI connection in the OpenScape 4000 as a LAN bridge for teleworking and for connecting ISDN equipment that can then be used for communication along with the devices connected (for example, analog telephones, fax devices (see list of supported devices in FDB2-3 for NI BRI, V1.0, Appendix B). Only those NI BRI functions that are needed to support this customer requirement have been implemented.

5.19.2 User Interface

You must enter the SPID value (Service Profile Identifier) in the following format to initialize the station device:

<DN>01

DN ... via the user defined on the current S0 port with the AMO SBCSU.

Example:

- Using DN configured on AMO SBCSU: 3188
- Using the SPID to be entered via the ISDN user interface 318801

5.19.3 Service Information

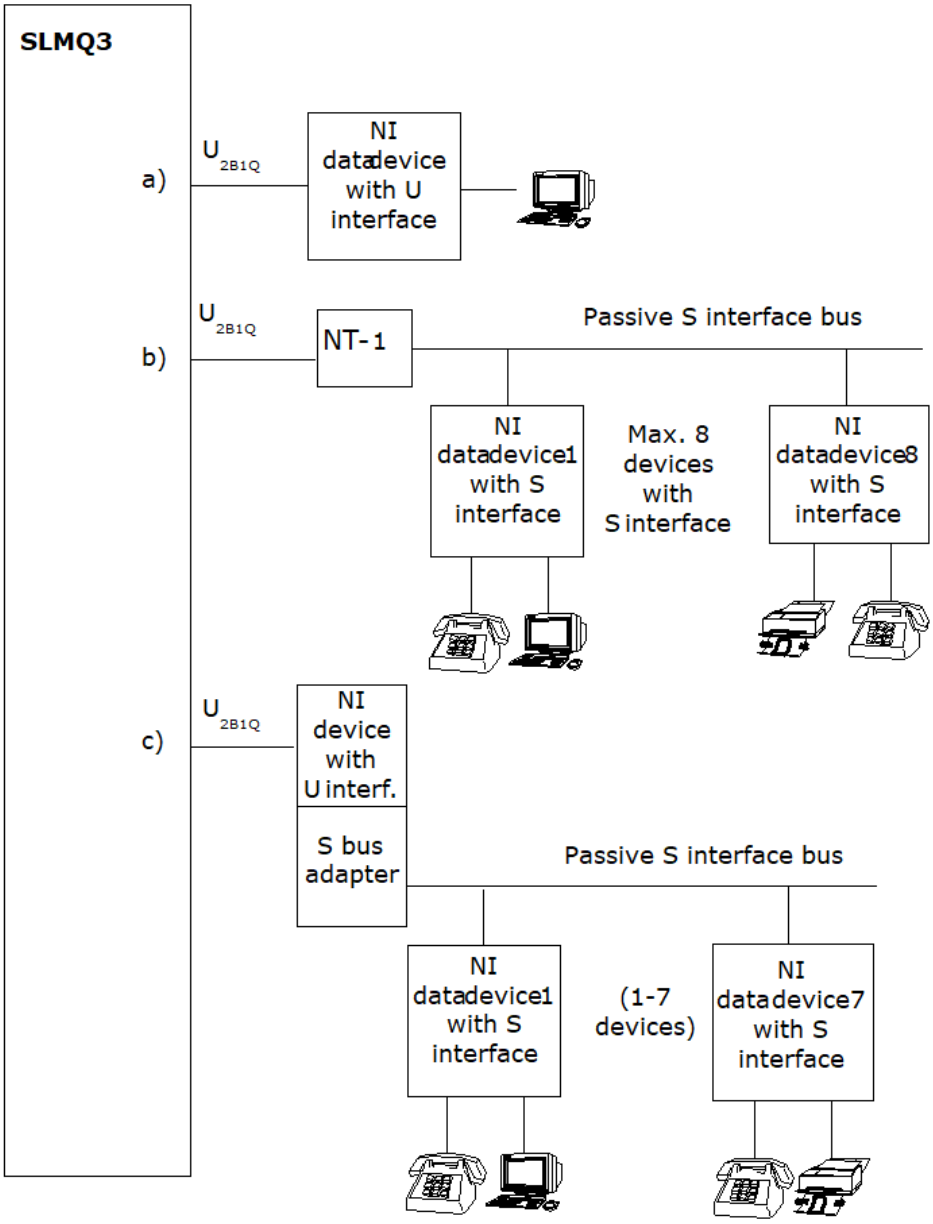
5.19.3.1 Connecting NI BRI Data Devices via the SLMQ3 Card

The SLMQ3 trunk card provides the physical two-wire interface U2B1Q, controls the connection in the D channel on the data link layer (LAPD), and transports the Layer 3 signaling information between the NI BRI data device and the OpenScape 4000 system. One SLMQ3 connection can support a maximum of 8 devices. This includes analog devices that are possibly connected behind the data devices with U or S interfaces.

OpenScape 4000 supports NI BRI devices on a SLMQ3 port as follows:

- Maximum of one data device with U interface that is directly connected with an SLMQ3 port.
- Maximum of eight data devices with S interface, which are in turn connected with one non-company-specific NT1 device that is connected to an SLMQ3 port.
- Up to seven data devices with S interface that are connected with a "passive S interface bus adapter", which in turn is connected to a non-company-specific data device that has a U interface and that is on an SLMQ3 port.

It is not possible to connect both NI BRI and DSS1 equipment to a BRI at the same time.



5.19.3.2 Connecting NI BRI Date Devices via the SLMO Card

OpenScape 4000 supports the connection of NI BRI data devices both via the ISDN terminal adapter (known as TA S0) in an optiPoint telephone and via the USB port of an optiPoint telephone.

The TA S0 is the NT1 reference point; the connected NI BRI data devices can access the B and D channels of an SLMO port via the TA S0. Included in the NI BRI data devices supported over this interface are Group 4 fax devices and data station devices. These have their own power supplies.

The TA S0 module performs the Layer 1 interworking between the NI BRI data device with S interface and the UP0/E transmission code to the SLMO card. The Layer 2 and 3 signaling information is transparently transported between the NI BRI data device and the OpenScape 4000 system.

The TA S0 is supported in optiPoint telephones. With the optiPoint telephones, OpenScape 4000 also supports a 2B + D interface, which is provided via the ISDN application on a PC that is connected to the optiPoint telephone USB port.

5.19.3.2.1 Restrictions With the TA S0 Configuration

You must install at least one TA S0 in the optiPoint master telephone. In this case, you can connect a maximum of two NI BRI data devices with S interface to the TA. As an exception to the "3-device rule" that applies to the SLMO card, you can also configure an analog device (for example, a telephone or fax device) on each of the NI BRI data devices with S interface. If you install a TA t/r (analog adapter) in addition to the TA S0 in the optiPoint master telephone, you can connect only one NI BRI data device with S interface to the TA.

IMPORTANT: You cannot install the TA 232 in the optiPoint!

5.19.3.2.2 General Configuration Restrictions

1) A SLMO port can support a maximum of three devices. This is known as the "3-device rule".

2) You cannot connect both NI BRI and DSS1 equipment to a BRI port at the same time.

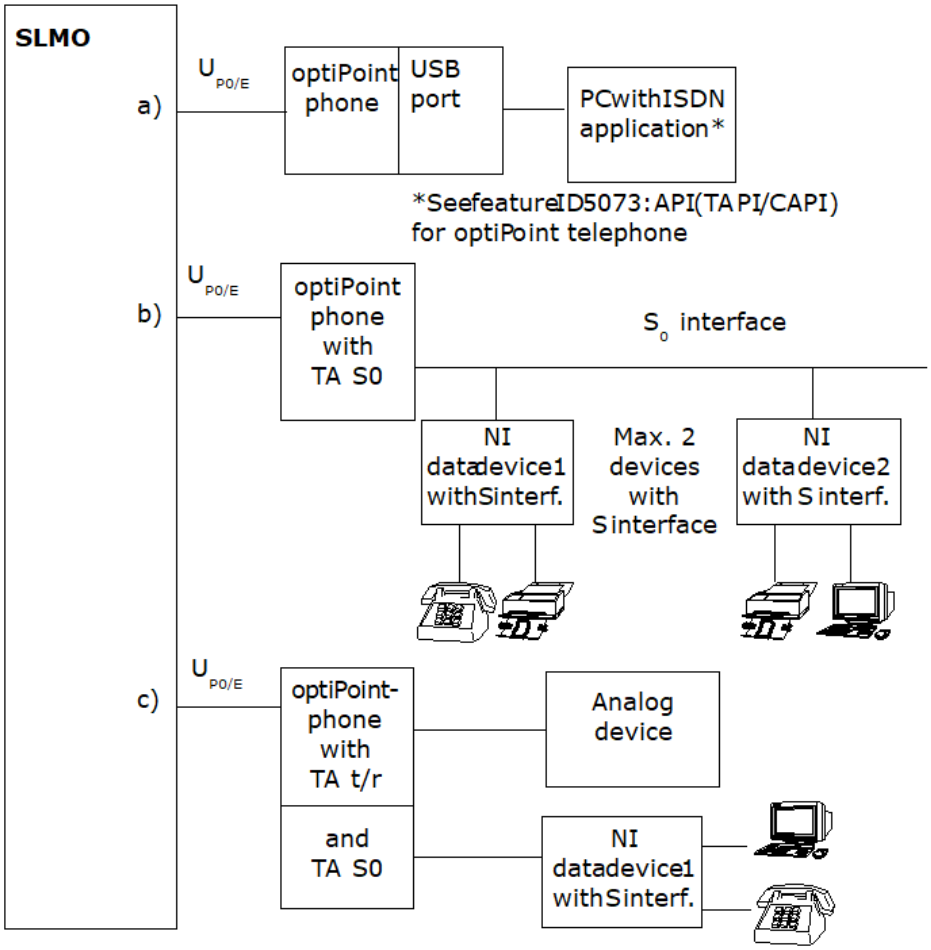
5.19.3.2.3 Connecting NI BRI Data Devices via the optiPoint Telephone

OpenScape 4000 supports the connection of NI BRI applications and data devices via an OptiPoint telephone as follows:

1) A 2B + D interface that is provided by an ISDN application in a PC, which in turn is connected to the USB port of an OptiPoint telephone; see FDBs for the feature ID 5073 for information on NI BRI support via the USB interface: API (TAPI / CAPI) for OptiPoint telephone.

2) Maximum of two NI BRI data devices with S interface. As an exception to the SLMO card "3-device rule", an additional analog device (for example, a telephone or fax device) on each NI BRI data device that is connected to the TA S0 terminal adapter in an OptiPoint telephone in which no other TAs are installed.

3) An NI BRI data device with S interface that is connected to an TA S0 terminal adapter in an OptiPoint telephone in which a TA t/r terminal adapter is also installed.



5.19.3.3 NI BRI Partner Products Supported by OpenScape 4000

Device	Interface
NT1 network terminators	
Motorola	NT1D
Adtran	NT1ACE
Alpha Telecom	UT620
Alpha Telecom	UT812 built-in version
TA ISDN terminal adapter	
Motorola BitSURFR	U interface
Zyxel ISDN modem	S/T or U interface
Cardinal - IDC 100i (PC card)	U interface
Diamond - Supra Net Commander (PC card)	U interface

Device	Interface
3Com Impact IQ	U interface
US Robotics Courier Modem	U interface
LAN Bridge / Router	
Cisco 1604U Router	U interface
ACC Congo Router	U interface
Ascend MAX1800 Router (supports 8 BRI ports)	U interface
Lan Rover E Plus Shiva Router (supports 4 BRI ports)	S/T interface
Ascend Pipeline 400	S/T interface
Ascend Pipeline 50	S/T interface
Gandalf 5242I	U interface
Cisco 766	S/T interface
Cisco 201	S/T interface
Cisco 4500 (BRI)	S/T interface
Video systems	
Adtran ISU 512	U interface
PictureTel PCS100	Desktop
PictureTel Venue 2000	Desktop
PictureTel Concord 4500	Group Video
PolyCom ViaVideo View Station	Group Video
Proshare Video System	Group Video
Modems	
US Robotics 56k Sportster (external with X2 technology)	
33.6 Cardinal Modem Model 2460 (external)	

5.19.4 Generation (Example)

5.19.4.1 First-Time Loading of the NI BRI Protocol Data

The protocol for the NI BRI interface must be on the hard disk before you configure the system.

- Check whether the NI BRI protocol data has already been loaded from the hard disk.
  `DISPLAY-PRODE:SRC=DB,KIND=PDSHORT;`

  If the NI BRI protocol is already available, the following entry appears in the column under PDSTRING:

  "S0-BUS NI-BRI GR-268-CORE"

  If the column is empty, you can supply the protocol with one of the two following methods:

  Load only the missing portion of the NI BRI protocol data.

  Load a collection of all US-specific protocol data at the same time (among the data is the NI BRI protocol).

  For method (1) above, simply load the missing NI BRI protocol data separately in the above DISPLAY-PRODE output. Determine the first available index PDxy (column PDNAME) without a PDSTRING description. This is the index where the NI BRI protocol data can be loaded.

  In this example, PDNAME=PD11.
- In the next step, determine the PDNO index used to store the original NI BRI protocol data.
  `DISPLAY-PRODE:SRC=HD,KIND=PDSHORT;`

  In this example, PDNO=41
- Now you can load the NI BRI protocol data from the hard disk in DB ... */
  `COPY-PRODE:KIND=PD,PDNO=41,PDNAME=PD11;`
- Release of the protocol for CP */
  `CHANGE-PRODE:KIND=PD,PDNAME=PD11,SEC=ORG,ACTIVE=Y;`

  To load all US-specific protocol data simultaneously with method (2), determine the PVCDNO index used for storing the collection of US protocol data on the hard disk.
  `DISPLAY-PRODE:SRC=HD,KIND=PVCDSHRT;`

  The overview display must contain a line with "UNITED STATES OF AMERICA" (column DESCRIPTION).

  In this example, PVCDNO=16 is the index for this line.
- Now you can load the US protocol collection from the hard disk in DB ... */
  `COPY-PRODE: KIND=PVCD, PVCDNO=16;`

  When you use this method, you do **not** have to release the new protocol data for CP*/.

5.19.4.2 Connecting NI BRI Data Devices via the SLMQ3 Card

Example for configuring a subscriber with NI BRI data device (connected with SLMQ3 port via PNT) in a PBX:

- If no SLMQ3 port is available (module not configured or no free ports)
  ADD-BCSU:MTYPE=PER,(LTG=1,)LTU=5,SLOT=67,PARTNO="Q2479-X";
- Configure subscriber 3188 with NI BRI data device that is connected to the SLMQ3 card via PNT.
  ADD-SBCSU:SSTNO=3188,OPT=FBUS, CONN=PNT, PEN=1-5-67-0,

  DVCFIG=SET600&DTE,COS1=5, COS2=6,LCOSV1=11, LCOSV2=12,

  LCOSD1=21, LCOSD2=22, SPROT=SBNIBRI, DPROT=SBNIBRI,

  SOPTIDX=7, DOPTIDX=7, BASICSVC=UDI64;
- Configure MSN 3189 on S0 bus 3188 */ NOTE: The NI BRI protocol set for the S0 bus 3188 is also automatically used for all accompanying MSNs and can be changed only for the 3188.
  ADDSBCSU:SSTNO=3189,OPT=MSN,MAINO=3188,BASICSVC=UDI64&UDI64;

5.19.4.3 Connecting NI BRI Data Devices via the SLMO Card

Example for configuring a subscriber with an NI BRI data device (directly connected to the SLMO port) in a PBX system:

- If no SLMO port is available (module not configured or no free ports)

  ADD-BCSU:MTYPE=PER,(LTG=1,)LTU=5,SLOT=73,PARTNO="Q2158-X";
- Configure an Opti connection: optiset E-Master 3160 connected directly to the SLMO */

  ADD-SBCSU:SSTNO=3160,OPT=OPTI,CONN=DIR,PEN=1-5-73-06,
  DVCFIG=OPTISET,COS1=5,COS2=6,LCOSV1=11,LCOSV2=12,LCOSD1=21
  ,LCOSD2=22;
- To extend this Opti connection: S0 bus 3168 with NI BRI data device

  IMPORTANT: The system automatically configures the TA S0 that you must install for connecting S0 devices in Optiset E-Master 3168.

  ADDSBCSU:SSTNO=3168,OPT=OPTIEXP,MAINO=3160,DVCFIG=SET600&DTE,
  COS1=5,COS2=6,LCOSV1=11,LCOSV2=12,LCOSD1=21,LCOSD2=22,SPROT=S
  BNIBRI,DPROT=SBNIBRI,SOPTIDX=7,DOPTIDX=7,BASICSVC=UDI64;
- Configure MSN 3169 (with reference to the S0 bus 3168) for the Opti connection.

  IMPORTANT: The NI BRI protocol set for the S0 bus 3168 is also automatically used for all accompanying MSNs and can be changed only for the 3168.

  ADDSBCSU:SSTNO=3169,OPT=MSN,MAINO=3168,
  BASICSVC=UDI64&UDI64;

- Opti connection configuration: OptiPoint-Master 3170 and PC with ISDN application connected directly to the SLMO.

  IMPORTANT: The system automatically configures the USB adapter that is needed for the PC connection and that is integrated in the OptiPoint-Master 3178.

```
ADD-SBCSU:SSTNO=3170,OPT=OPTI,CONN=DIR,PEN=1-5-73-07,
DVCFIG=OPTI500&DTE,COS1=5,COS2=6,LCOSV1=11,LCOSV2=12,
LCOSD1=21,LCOSD2=22,DPROT=SBNIBRI,DOPTIDX=7,BASICSVC=UDI64;
```

5.19.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
BCSU	SACHNR	d	baugruppensachnummer (2. und 3. block) : = Q2479-X zum Einrichten einer SLMQ3 Baugruppe
	PARTNO	e	board/module number from part catalog : = Q2479-X to set up an SLMQ3 module
CTIME	T400	d	ueberwachungszeit der nationalen ISDN bruecke
		e	timer for national ISDN bridge
DTIM1	TINT1	d	ueberwachungszeit fuer die terminal initialisierung
		e	control timer for terminal initialization procedure
PRODE	PROTVAR	d	protokollvariante : = SBNIBRI fuer NI BRI
		e	protocol variant : = SBNIBRI for NI BRI
	TIMERID	d	Identifikation des Timers : = T408
		e	timer identification : = T408

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
SBCSU	BASICSVC	d	basic service voreinstellung fuer geraete mit NI BRI prot. : = AUDIO3K1 fuer 3.1khz audio = SPRACHE = UDI64 fuer 64kbps unrestricted digital information = UDI64RA fuer 64kbps unrestricted digital information (rate adapted)
		e	basic service default value for devices with NI BRI protocol : = AUDIO3K1 for 3.1khz audio = SPEECH = UDI64 for 64kbps unrestricted digital information = UDI64RA for 64kbps unrestricted digital information (rate adapted)
	DOPT	d	index auf optionstabelle (amo zand) : = 7 fuer NI BRI
	DOPTIDX	e	index into option table for data device (dte) on s0 bus : = 7 for NI BRI
	DPROT	d	protokollvariante des funktionalen dee-endgeraetes am s0-bus : = SBNIBRI fuer NI BRI
		e	protocol variant for data device (dte) on s0 bus : = SBNIBRI for NI BRI
	FOPT	d	index auf optionstabelle (amo zand) : = 7 fuer NI BRI
	FOPTIDX	e	index into option table for facsimile device (fax) on s0 bus : = 7 for NI BRI
	FPROT	d	protokollvariante des funktionalen fax-endgeraetes am s0-bus : = SBNIBRI fuer NI BRI

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
		e	protocol variant for facsimile device (fax) on s0 bus : = SBNIBRI for NI BRI
	SOPT	d	index auf optionstabelle (amo zand) : = 7 fuer NI BRI
	SOPTIDX	e	index into option table for voice/speech device on s0 bus : = 7 for NI BRI
	SPROT	d	protokollvariante des funkt. sprach-endgeraetes am s0-bus : = SBNIBRI fuer NI BRI
		e	protocol variant for voice/speech device on s0 bus : = SBNIBRI for NI BRI

5.20 Network Loops

5.20.1 Feature Description

Network loops can occur as a result of faults in the network (e.g. failure of lines or nodes) or as a result of traffic load congestion (busy trunk groups). They are liable to occur in networks with both open and closed numbering schemes.

There are four methods by which network loops can be (largely) prevented or at least limited.

5.20.2 Methods of Preventing Network Loops

1) Method: Prevention of network loops by checking for prohibited connections in the node connecting matrix. Potential loops can be avoided right from the network planning stage. For this purpose, specific connections are barred in a node connecting matrix based on virtual originating/destination node numbers. This matrix, which is initialized to permit all connections, is administered by AMO KNMAT. The check for prohibited connections is carried out in all nodes involved in a connection. When applying this method, note the following carefully:

- **a)** The traffic paths are restricted; this can adversely affect the load distribution in the network.
- **b)** Not all loops can be prevented.
- **c)** CONN=D is set for all NPIs.

2) Method: Limitation of network loops with TRANSIT-COUNTER This counter prevents endless loops in the network. Threshold values are set for incoming circuits or trunk groups in each node. In each transit node the currently active counter in the network protocol is incremented and compared with the threshold value. If the threshold value is reached, the connection is cleared and an advisory issued. If nodes of variants up to and including Hicom 3000 V3.2 are involved in a connection, the TRANSIT-COUNTER information is lost. In general, a connection (or several connections) cannot be set up if a threshold value is set too low.

3) Method: Prevention of network loops by temporarily reducing classes of service. LCR classes of service can be reduced or removed using the AMO KNLCR for combinations of virtual originating and destination nodes. This prevents occupation of a specific LCR route or generally prevents further routing in this network node for combinations of virtual originating and destination nodes.

5.20.3 Service Information

- In each physical network an unambigous node number and an umambigous code for the Route Optimization feature must be assigned by means of AMO ZAND, parameters PNNO and PNODECD (Method 1).
- Each route must be assigned a virtual destination node number by means of AMO RICHT, parameter NODENO (Method 1,3).
- Incoming digital circuits of nodes up to and including Hicom 300 V3.2 and analog circuits must be assigned a fictitious virtual node number by means of AMO TDCSU, AMO TACSU, parameter **ORNDNO** and activated via the COT parameter **DFNN**/**LWNC** (Method 1,2).
- For incoming digital circuits of nodes up to and including Hicom 300 V3.2 a class of trunk must be created with AMO COT, parameter **COTPAR= LWNC**, and assigned to the circuits with AMO TDCSU, parameter **COTNO** (Method 1, 3).
- Incoming digital circuits must be assigned TRANSIT-COUNTER threshold values by means of AMO TDCSU, parameter TRACOUT. The TRANSIT-COUNTER check must be activated by means of AMO COT, parameter COTPAR=ATRS. This value is always applicable to all circuits in a trunk group (Method 2).
- Incoming digital circuits of Hicom 300 V3.3 nodes must be assigned the value **CORNV33** or a an appropriate protocol in new variants such as QSIG, by means of AMO TDCSU, parameter **PROTVAR**, in order to ensure transmission of the node numbers in the network protocol (Method 1, 2, 3).
- If the default value is insufficient, the prevention function can be extended by means of AMO DIMSU, parameter RSTCON (Method 1).
- The traffic restrictions of the node connecting matrix can be removed for the attendant console (AC) by means of AMO ZAND, TYPE=ATND, parameter ACCHECK (Method 1).

5.20.4 Generation (Example)

The node connecting matrix must be set individually in each network node (Method 1). The examples show how loops can occur with the different types of numbering and how they can be prevented by appropriate matrix setting.

5.20.4.1 Network with Open Numbering; Alternate Routing with Complete Set of Prefix Codes

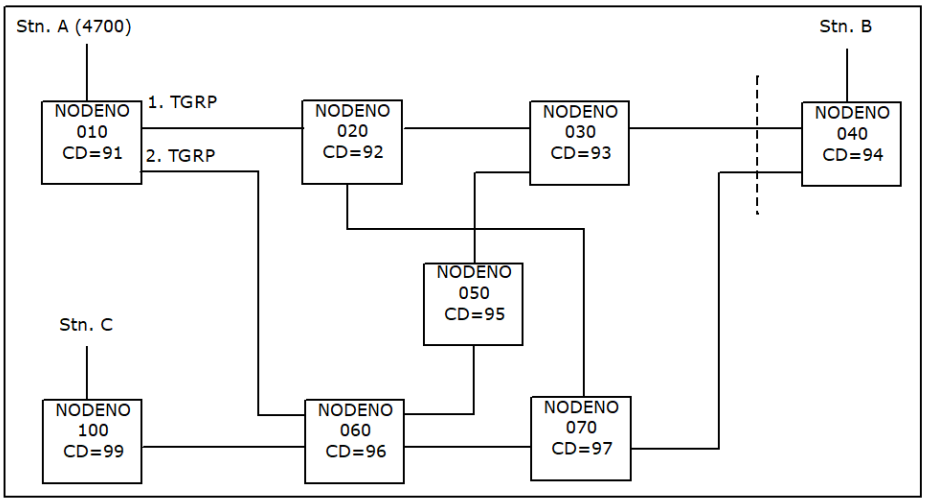


Figure 47: Alternate Routing with a set of Prefix Codes

Routes to node 040 are configured in NODENO 010:

- Route with route code 94 with first trunk group and PREFDGT1=9394
- Route with route code 94 with second trunk group and PREFDGT1=9794 (alternate routing trunk group)

  Station A dials 944711;in NODENO 010 the dialing of 94 leads to DAR=TIE.

  A loop can be formed if, for example, both trunks to NODENO 040 develop a malfunction or are overloaded, or if a failure occurs in node 040. An alternate routing trunk group is then seized in NODENO 030, in this case via NODENO 050, 060 and 070. all number 9697944711 is transmitted on the trunk from NODENO 030 to NODENO 050, since the alternate routing trunk group (route code=94) is configured with PREFDGT1=969794.

  If the message is received at NODENO 070 (call number = 944711), it is established that the direct trunk group for route code 94 is unavailable. The alternative trunk group with PREFDGT1=9394 is seized on the trunk to NODENO 020. The loop, comprising the 5 nodes NODENO 030, 050, 060, 070 and 020, is now closed. All available B channels are seized in turn.

  The loop can be prevented by restricting the permissible connections (AMO KNMAT). In NODENO 050 all connections from source node NODENO 010 to destination node NODENO 040 are prohibited. The configured routes (1st and 2nd trunk groups) can both still be used. Stations connected to other nodes (e.g. station C, NODENO 100) can also use the transit route via NODENO 050.
- Example Method 1 - command in NODENO 050:
  `CHA-KNMAT:LEVEL=0,SNNO=10,DNNO=40,CONN=D;`
- Example Method 3- command in NODENO 050:
  `ADD-KNLCR:SNNO=10,DNNO=40,REDSLCOS=1&&64;`

5.20.4.2 Network with Open Numbering; Alternate Routing with one Prefix Code

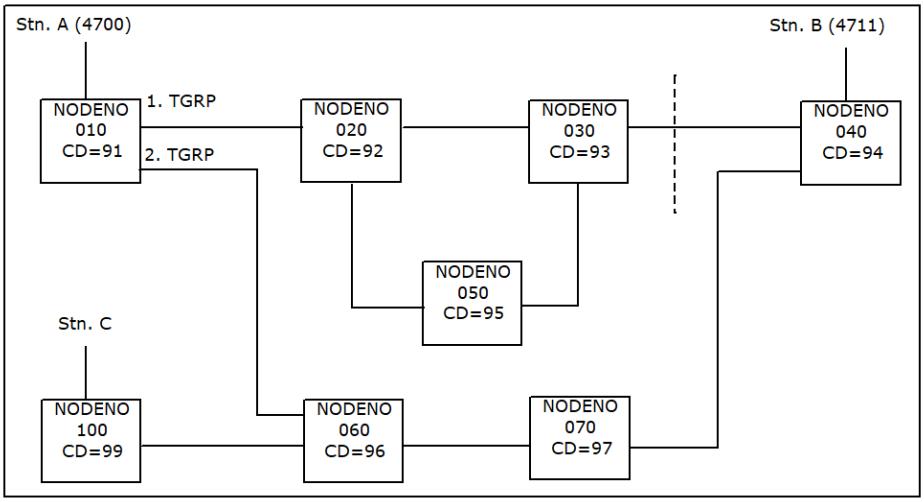


Figure 48: Alternate Routing with one Prefix Code

In this case a single fault can produce a loop. The reason is that only the node code of the destination node is supplied as the prefix code. In each transit node the path to the next transit node in the direction of the destination is redefined. Routes to node 040 are configured in NODENO 010:

- Route with route code 94 with first trunk group and PREFDGT1=94
- Route with route code 94 with second trunk group and PREFDGT1=94 (alternate routing trunk group)

  Station A dials 944711. In NODENO 010 the dialing of 94 again leads to DAR=TIE. Call number 944711 is sent to NODENO 020, where route code 94 is also assigned with PREFDGT1=94, with the result that call number 944711 is transmitted to NODENO 030. Here a direct trunk group is configured for route code 94 (no prefix). The number forwarded to NODENO 040 is thus 4711.

  With this configuration a loop may occur if, for example, the trunk from NODENO 030 to NODENO 040 has a fault. An alternative trunk group, e.g. via NODENO 050, is then used in NODENO 030. From here a trunk group can then be seized in the direction of NODENO 030 or an alternative trunk group via NODEO 020. In either case a loop is formed. This can be prevented by means of a prohibition criterion in NODENO 050:
- Example Method 1 - command in NODENO 050:
  `CHA-KNMAT:LEVEL=0,SNNO=10,DNNO=40,CONN=D;`
- Example Method 3- command in NODENO 050:
  `ADD-KNLCR:SNNO=10,DNNO=40,REDSLCOS=1&&64;`

5.20.4.3 Network with Closed Numbering

In a network with closed numbering the node codes have no significance in the path selection process. In each transit node a path to the destination is defined with the aid of the digit analysis facilities (the destination is only defined by the station number). Network loops are formed in the same way as for networks with open numbering/alternate routing with one prefix code.

5.20.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
KNLCR	UKNNR	d	Ursprungsknotennummer
	SNNO	e	Source node number
	ZKNNR	d	Zielknotennummer
	DNNO	e	Destination node number
	ERWLBER	d	Erweiterung der vorgegebenen LCR-Berechtigung
	ADDSLCOS	e	Add to LCR classmark subset
	REDLBER	d	Reduzieren der vorgegebenen LCR-Berechtigung
	REDSLCOS	e	Reduce the LCR classmark subset
KNMAT	UKNNR	d	Ursprungsknotennummer
	ONNO	e	origin node-number
	ZKNNR	d	Zielknotennummer
	DNNO	e	destination node number
	EBENE	d	Ebene der Knotennummern
	LEVEL	e	level of the node numbers
	VBDG	d	Verbindung erlaubt / verboten
	CONN	e	connection allowed / denied
COT	COTNU	d	Class of Trunk (Nummer)
	COTNO	e	Class of Trunk
	COTPAR	d	Parameterwerte für eine Class of Trunk
	PAR	e	Parameter values of a Class of Trunk
ZAND	TYP	d	Auswahl des Datentyps
	TYPE	e	Desired system option
	PKNNR	d	ADreistufige Knotennummer zur eindeutigen Identifikation des Knotens im Netz
	PNNO	e	Node number (until 3 levels) for unambiguous identification in network
	PKNOTKZ	d	Kennzahl eigener Knoten

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	PNODECD	e	Physical node number.
TDCSU	LAGE	d	Anschlusslage des Trunks: ltg-ltu-ebt-satz
	PEN	e	Port Equipment Number: ltg-ltu-slot-cct
	TRACOUNT	d	Transit-Counter. Standardwert: 31
	TRACOUNT	e	Transit Counter. Default value: 31

5.21 Number Modification

5.21.1 General Description and Rules

With the format-dependent number modification the network configurator does not have to worry about the source and target relationships for the **PRIVATE** and **ISDN** numbering plans when configuring a OpenScape 4000/HiPath 4000 network for the first time, but can limit the configuration to the standard entries (codes in AMO KNDEF and KNPRE settings).

Multiple levels of node numbers

Due to the multiple levels of the node numbers, modifications now can be made at each level in a targeted manner. Through the introduction of the logical node numbers (OWN,ROW=all nodes), the previously complicated AMO KNMAT settings can be limited to a few, logically simple entries.

Virtual node numbers

Virtual node numbers are used to define the numbering plan data for subscribers and thus are the basis for number modification. The fundamentals for physical and virtual node numbers are described in Chapter 21, "Basic Networking Principles".

Physical node numbers

Physical node numbers have to differ from virtual ones since only the physical ones can be used as a unique identifier for a PABX. Virtual nodes can be distributed over several PABXs and thus not identify an individual PABX.

Nnumbering plans

- Several E.164/PNP numbering plan ranges/codes per physical node

  This feature allows for example, a move while keeping the fully qualified phone number (E.164 with local destination code, national code, international code), which may make sense in a collocated system with several nodes (and thus several CO numbers) in one location. Stations, however, must still remain unique for each PABX. It is also possible to configure the phone numbers 49 89 722 4711 and 49 89 636 4712 to one PABX, but not 49 89 722 4711 and 49 89 636 4711. This must be taken into

consideration in case of moves. If the subscriber 49 89 722 4711 is moving from node 1 to node 2, the station number cannot be retained if a subscriber already has extension 4711 (**) e.g.: 49 89 636 4711) on node 2.

This feature is also of interest for IPDA numbering plans.

IMPORTANT: For format-dependent number modification, only the assignment of the subscriber to a virtual node = numbering plan range is relevant! The assignment of the subscriber to a virtual node (AMO SDAT) and the numbering plan data defined to this node (AMO KNDEF) is also relevant.

- Overlapping phone numbers:

  Phone numbers (extensions) can overlap in the node code/local destination code of the E.164 number/local code of the PNP number. This feature is used if the required number of public phone numbers is not available in a consecutive range for a private network.

  Provided that the private network requires 1800 CO numbers, but cannot obtain any four-digit DID ranges from the public numbering plan (assigned or too expensive). In this case, two three-digit DID ranges can be used, e.g. the local destination codes 723 and 724 that result in CO numbers 723 xxx and 724 xxx. Since the internal phone numbers must be unique, however, the three-digit numbers xxx may not be used as internal numbers. One solution is a "double use" of the last digit of the local destination code as the first digit of the internal number, the "overlapping". This results in four-digit internal numbers ranging from 3000 to 4999, so more than enough.

  None up to all of the digits of the local destination code/local code/node code may overlap. The non-overlapping digits are the skip digits, that is, the digits that have to be removed to form the internal number. The number of skip digits must be configured (AMO KNDEF). The default here is "no overlapping", all digits are skip digits.

  In the example above, we have a three-digit local destination code and an overlapping digit (Digit 3 or 4), the number of skip digits is thus two.
- Modification for external nodes:

  If an OpenScape 4000 system networks with systems that do not have number modification and, for example, that can send only extension numbers as "calling numbers", the OpenScape 4000 can modify the external nodes. The administration of the modification with E.164 or PNP codes has been improved:

  External nodes for which the OpenScape 4000 (in its place) should modified are entered in the AMO KNDEF table under TYPE=EXTERNAL together with their codes. Phone numbers supplied by these external nodes are thus supplemented by the specified codes so that they appear delivered in the correct format. After this external modification, they are subject to the standard modification rules.

  IMPORTANT: Standard partner nodes that supply valid numbers must not be included in AMO KNDEF!

  The standard assignment is one physical node = one virtual node. In order for you to have to make as few changes as possible in the configuration of

partner nodes when upgrading a OpenScape 4000 node within a network, we recommend using the original node number as the virtual node number and defining a new node number for the physical node number. Partner nodes must not change the configuration for routes (RICHT, LDAT) and number modification (KNMAT, KNFOR).

5.21.1.1 Summary

Due to the great size of the number modification feature, the description is preceded by a summary of the principles and rules.

The number modification has the task of modifying a phone number entered as additional information ("calling number") in such a way that the dialing of this number can always be interpreted by the system and a connection established to the "calling number" at any time or place in the network.

There are two parallel methods for modifying the calling number:

Format-dependent number modification (AMO KNDEF, AMO KNPRE, AMO KNFOR)

For this modification method, you must do the following:

- Set the exit codes and prefixes to your own node (IDSN or PRIVATE) using AMO KNPRE.
- Set the codes (e.g. country code, area code, etc.) using AMO KNDEF.
- If destination nodes require certain formats, set them using AMO KNFOR (TONOUT).
- If a special display format is desired at your own node, configure it using AMO KNFOR (TONIN).

The most important rules:

1) In each node that can be addressed with numbering plan NPI=ISDN or NPI=PRIVATE, all prefixes and exit code should be set up for the possible numbering plans using AMO KNPRE!

2) All required numbering plans should be defined in AMO KNDEF. In case of CO lines, all E.164 entries are to be made here.

3) The node format table (AMO KNFOR) should always be set up when external nodes require a certain format of the numbers or if the subscribers require a certain display format on their own node. If the KNFOR is not set up, the calling number will be by default displayed in the highest format (e.g. TON=INTERNAT) when outgoing and to the lowest possible format (e.g. TON=UNKNOWN) when incoming!

The source/destination-controlled modification (AMO KNMAT)

For this modification method, you must do the following:

- Using AMO KNMAT, set codes for certain source/destination combinations (virtual nodes). These codes should either be abbreviated from the calling number or placed before the calling number. If overlapping phone numbers are used, only the skip digits of the code to be supplemented or abbreviated should be entered.

The most important rules:

1) By default, only the logical node numbers OWN and ROW should be used in AMO KNMAT for the UNKNOWN numbering plan. The following rule applies here: in ONNOL=ROW to DNNOL=OWN, the own node code is abbreviated when incoming and, in ONNOL=OWN to DNNOL=ROW, the own node code is supplemented when outgoing. For the own node code, a new logical value can be used. Using an "Supplement/abbreviate OWN with own node code of virtual code" entry automatically performs an implementation for all virtual nodes and extracts the code belonging to the virtual node from the AMO KNDEF table.

2) By default, the AMO KNMAT should be used only for the UNKNOWN numbering plan (NPI parameter). The NPI=ISDN and NPI=PRIVATE numbering plans should be handled using format-dependent modification!

3) When multi-level node numbers are used, the codes in AMO KNMAT must be entered at the corresponding level; that is, a country code (e.g. 49) is always at Level 2, an area code (e.g. 89) is always at Level 1, and a local destination code (e.g. 722) is always at Level 0.

4) Modification conditions (the MODCON parameter in AMO KNMAT) must only be set for multi-level networks in levels 1 and 2.

- For the ISDN or PRIVATE numbering plans, format-dependent number modification should always be configured.
- For the UNKNOWN OpenScape 4000 numbering plan (i.e. the selection of tie line codes), source/destination modification must continue to be configured.
- If configured, the source/destination-controlled modification always has priority over format-dependent number modification during execution.

General rules, regardless of the selected method of number modification

Regardless of the selected method of number modification, there are a number of general rules stemming from the introduction of the new ISDN and PRIVATE numbering plans or from the expansion from the one-level to the three-level node number.

The most important of the general rules are as follows:

1) If numbering plans not equal to NPI=UNKNOWN are used in a node, each route element (AMO LDAT) is to be assigned the respective numbering plan (NPI) and the type belonging to the destination number (TON) in the corresponding outdial rule (AMO LODR).

2) Each node must be assigned a physical node number with AMO ZAND, parameter PNNO, and at least one virtual node number with AMO KNDEF. Each node number may be assigned only once in the network. Node number 0 is not valid.

3) All OpenScape 4000/HiPath 4000 networks can continue to be operated with one-level node numbers. If multiple levels are desired, however, the node number ranges should be adapted to those of the phone numbers!

4) When multi-level node numbers are used, all node numbers must be kept at the same level within the network! Even virtual and physical node numbers must have the same level.

Special rules for various connections

To connect multi-level subnets to one-level subnets and to connect OpenScape 4000 systems to external systems, a number of special rules must be observed:

1) If, by way of exception, a multi-level subnet is connected to a subnet that is not on the same level, the COT parameter LWNC (line without node number)

must be set in the respective set and a corresponding node number must be entered for this system in RICHT as the destination node. If the other system already has one-digit node numbers, LWNC must also be set there.

2) Systems that do not understand node numbers should always be assigned COT parameter LWNC in the trunks leading to them.
3) Lines that lead to external systems and that only transfer implicit phone numbers (for the definition, see Section 41.1.2.2, "Explicit and implicit phone numbers") must be provided with the COT parameter LINO. LINO may not be set for CO lines.
4) The COT parameter DFNN causes the fictive, virtual node number assigned to the set to be used for modification. It prevents a reconstruction of the source node number and should thus be set only in exceptional cases.

This brief overview is intended to provide a general idea. The following chapter, however, absolutely must be read and understood.

5.21.1.2 Phone numbers

5.21.1.2.1 Structure a phone number

The phone numbers transported in an ISDN network have further information in addition to the actual numbers. It thus provides information as to whether a number should be displayed (presentation indicator), how and whether a test takes or has taken place (screening indicator SCRE), to which numbering plan this number belongs (numbering plan identifier NPI), and which codes it contains (type of number TON). In an OpenScape 4000/HiPath 4000 network, the respective node numbers are also transferred together with the numbers ("calling numbers").

Three different numbering plans are supported:

1) ISDN CO numbering plan according to ETSI-E.164: NPI = ISDN
2) Private numbering plan (PNP) according to ETSI-E.189: NPI = PRIVATE
3) OpenScape 4000-specific numbering plan: NPI = UNKNOWN

Each node in the network can be set up parallel for all three plans. OpenScape 4000 phone numbers in a numbering plan NPI=ISDN or NPI=PRIVATE consist of the DID number, the various codes, the corresponding prefix and the exit code for the respective numbering plan:

Phone number:	Exit +	Prefix +	Code(s) +			Direct in dial
			CC	AC	LC	
e.g.	0	00	49	89	722	4711 (International STNO)
	0	0		89	722	4711 (National STNO)
	0				722	4711 (Subscriber STNO)

Abbreviations: CC=country code, AC=area code, LC=local destination code, STNO=phone number

The first zero in the example above signals the numbering plan. Traditionally, it means that the subscriber would like an exit to the central office. Since OpenScape 4000/HiPath 4000 networks can also be configured with CO

numbers (NPI=ISDN), however, only LCR decides whether a CO exit really takes place or whether a tie line is routed. The exit code (here, 0 for NPI=ISDN) is the only entry in which WABE must be set up (digit analysis result CO or TIE).

IMPORTANT: In corporate networks in which the numbering plan NPI=ISDN is also set up for network-internal calls, the exit code (e.g. 0) should be set up in WABE with a digit analysis result of TIE. The CO tone facility is then set up using the W field in the digit pattern plan (AMO LDPLN).

The prefix signal the level of a number. In Germany "00" must be dialed to reach international subscribers, for example, in England. The "0" says that a national subscriber, for example, in Dusseldorf, is required. If no prefix is dialed, the subscriber is in the caller's own local network, for example, in Munich. These levels are reflected in the type of number (TON) information. For NPI=ISDN, the values INTERNAT for international, NATIONAL for national, SUBSCR for subscriber-related, and UNKNOWN for DID numbers (e.g. 4711) can be assumed.

The addressing in the respective level takes place using the codes. For NPI=ISDN, the county code (CC) is thus used as the address of a country (e.g. 49 for Germany), the area code as the address of a city (e.g. 89 for Munich), and the local destination code (LC) as the address of the main station (e.g. 7007).

The structure of a phone number in the private numbering plan (NPI=PRIVATE) has the same structure as a number in the ISDN CO numbering plan. The only difference is in the naming of the parameters. The TON can thus assume the values LEVEL2, LEVEL1, and LOCAL and the codes are called Level 2 Code (L2C), Level 1 Code (L1C), and Local Code (LC). Both numbering plans, ISDN and PRIVATE, require that every point in the network is uniquely addressed and can be reached from every other point with precisely this address (e.g. if Germany can be reached with 49 from every point in the worldwide telephony network - only the exit and prefix may differ).

The structure of a phone number in the OpenScape 4000-specific numbering plan (NPI=UNKNOWN) behaves differently. Here, a certain node is addressed with open numbering with cross codes. Here, multiple addressing of a node may result, for example, if two networks are merged. The same node of Point A in the network may have another address - and thus another code - than that of Point B. This may lead to confusion and thus to errors in the execution of network-wide features.

Problems may also arise in the merging of existing networks. In such cases, the solution is to expand the hierarchy by one level so that the node numbers and assigned codes in the network are unique again. If a node in a subnet with the code 99 is connected to the node of another subnet that also has a code of 99, Level 1 is introduced. One node then receives the code 91-99 and the other the code 92-99. The only problem is that the area code 91 or 92 was dialed as well, which means that the numbers change. This has the disadvantage, however, that the numbers 91 and 92 must be unassigned in WABE. If Code 99 is unique in the network, however, it is not necessary to adapt the code when introducing a new level (for example, Node 1-2 would then have a code of 99).

All of these problems are avoided if the ISDN numbering plan is used for these networks. The following table shows the advantages and disadvantages of the numbering plans.

Table 10: Advantages/disadvantages of the various numbering plans

Numbering plan	Advantages	Disadvantages
ISDN	+ unique worldwide + hierarchical structure + simple generation + no getting used to internal numbers for the user	- somewhat long phone numbers - not always applicable for subscribers without CO DID numbers
PNP	+ hierarchical structure + simple generation	- somewhat long phone numbers - not guaranteed to be unique due to lack of coordination
OpenScape 4000 (UNKNOWN)	+ short phone numbers	- no hierarchical structure - somewhat high generation expenses - not unique

5.21.1.2.2 Explicit and implicit phone numbers

As described in Section , a phone number in ISDN networks has, in addition to the actual digits, additional information on NPI and TON. If this information is not included, for example, in the case of analog sets, or if the information has a value of UNKNOWN, only the digits must be meaningful; i.e., the address must be able to be reached solely by the dialing of the digits. This case is trivial since it appears during each dialing of a phone number by the user. Such a number that can be evaluated at any time by WABE has an implicit format according to the definition.

During the transport of the phone number, however, certain information contained in the digits can be extracted. Exit codes thus provide information on the selected numbering plan (NPI) and the prefix of the level of the number (TON). A dialed implicit phone number 0-0-89-722-4711 can thus also be transferred as 89-722-4711 with the additional information NPI=ISDN (since 0 is considered to be the exit in the CO numbering plan in this case) and TON=NATIONAL (since 0 is the prefix of a national number). These numbers, which contain no exit codes and no prefixes, but which are labeled by NPI and TON, are called explicit phone numbers. They cannot be analyzed by WABE and must thus be converted into an implicit format before evaluation.

According to definition, an explicit number must have an NPI not equal to UNKNOWN and a TON not equal to UNKNOWN. It may thus not contain exit codes or prefixes. The other way round an implicit number must always have TON = UNKNOWN and all required digits must possibly contain the exit code an prefixes. Table 1 shows the NPI/TON combinations defined in the ETSI standard. The designations on the AMO interface are marked with capital letters.

Table 11: ETSI NPI/TON combinations

NPI = E164 (ISDN)	NPI = PNP (PRIVATE)	NPI = UNKNOWN NPI = LANDMOB NPI = DATA NPI = MARITMOB NPI = NATIONAL NPI = TELEX
TON = International (INTERNAT)	TON = Level2-Regional (LEVEL2)	TON = UNKNOWN
TON = NATIONAL	TON = Level1-Regional (LEVEL1)	
TON = Subscriber (SUBSCR)	TON = LOCAL	
TON = UNKNOWN	TON = UNKNOWN	

The advantage of an explicit number lies in its independence from exit codes or prefixes, which, as previously mentioned, often differ in different networks and countries and, on the other hand, in the possibility of performing a source-independent number modification at any time, for example, if a call that was originally a national call is routed via an international network. In the standard case for explicit numbers, a source/destination-dependent modification thus becomes completely unnecessary with AMO KNMAT.

AMO KNPRE regulates the relationship between the explicit and implicit numbers. This defines which exit code belongs to which prefix for a certain NPI/TON combination. In the example above, the exit "0" thus belongs to the combination NPI=ISDN and TON=NATIONAL. The actual codes (e.g. CC, AC, LC) are saved in AMO KNDEF in the case of explicit numbers.

Since external nodes that understand only implicit numbers possibly supply the NPI/TON information incorrectly (e.g. station with NPI=ISDN, TON=SUBSCR), which leads to errors in the number modification, the COT parameter LINO was introduced.

RULE:

The COT parameter LINO (line with implicit numbers) causes the format of all numbers to be overwritten with UNKNOWN by default whether incoming or outgoing. If an explicitly signaled, external node (e.g. central office) can be reached by means of a set with this number, an entry for this node must exist with AMO KNFOR.

5.21.1.3 US EPNP

One special case of a numbering plan is the plan formerly used in U.S. systems (R6.6), EPNP (Enhanced Private Numbering Plan). In the process, a PNP numbering plan that works without an exit code and without prefixes is configured. The number thus complies with the following scheme:

Phone number:	Exit +	Prefix +	Code(s) +			Direct in dial
			L2 Code	L1 Code	Loc Code	
e.g.			99	88	777	4711 (Level 2 STNO)
				88	777	4711 (Level 1 STNO)
					777	4711 (Local STNO)

Abbreviations: STNO=Station, i.e. phone number

In special cases, exit codes may also exist.

A normal PNP for comparison:

Phone number:	Exit +	Prefix +	Code(s) +			Direct in dial
			L2 Code	L1 Code	Loc Code	
e.g.	9	11	99	88	777	4711 (Level 2 STNO)
	9	1		88	777	4711 (Level 1 STNO)
	9				777	4711 (Local STNO)

A typical EPNP, however, only consists of a three-digit local code (no L1 and L2 codes) and a six-digit internal number. The signaling takes place in explicit format with NPI= PRIVATE and TON=LOCAL.

Since the number that can be dialed (i.e. the implicit number) has no exit and no prefixes, it is thus more similar to a number of the OpenScape 4000-implicit numbering plan. The consequence is that no unique, explicit number can be extracted from the implicit number. The configuration is thus a mixed form of the explicit numbering plan and cross codes (for an example, see below).

5.21.1.3.1 The (multi-level) node numbers

Dependency of the (multi-level) node numbers on the phone numbers

A general definition of the node numbers can be found in the "Networking Terms" chapter. Here, the role of the node numbers during number modification is described.

Since an individual number is not assigned to every node in an OpenScape 4000/HiPath 4000 network (e.g. several nodes are hidden behind the main station 089 7007), physical node numbers are used in a network as the unique address of a node. These node numbers are entered in various AMOs (ZAND, RICHT, etc.) and transported according to the number in the network protocol.

Based on the ISDN or PRIVATE numbering plan, a node number also has a hierarchical structure. It has Levels 0, 1, and 2. Just like the numbers, the individual levels of the node number define the respective number ranges. All nodes of a company in Munich, for example, may differ in Level 0, all cities

of the company in Germany in Level 1, and all company countries in Level 2. It must be observed here that the node number is uniquely assigned to a node only in Level 0. The other levels describe ranges of subordinate nodes or levels. The ranges described in this manner must always be coordinated with the number ranges (e.g. the number area 89 for Munich should be precisely assigned an area number in Level X).

Rules

RULE:

A physical node number must be assigned to each node with AMO ZAND, parameter PNNO, which may be assigned only once within the network.

Node number 0 is not valid.

RULE:

All OpenScape 4000/HiPath 4000 networks can continue to be operated with one-level node numbers. If multiple levels are desired, however, the node number ranges should be adapted to those of the phone numbers!

RULE:

When multi-level node numbers are used, all node numbers must be kept at the same level within the network! If this is not possible, for example, since external nodes do not understand node numbers the COT parameter LWNC (line without node number) must be set in the respective set and a corresponding multi-level node number entered as destination node for this system in RICHT. If the other system already has one-digit node numbers, LWNC must also be set there.

RULE:

Systems that do not understand node numbers should always be assigned COT parameter LWNC in the trunks leading to them. LWNC always functions in an outgoing direction.

RULE:

The COT parameter DFNN should be used only in exceptional cases. The effect of DFNN is that the TDCSU node number is used for the modification when incoming and the reconstruction of the node number from the number is prevented. The disadvantage here is that a node-specific modification is prevented. A certain advantage results from an improvement in performance through the prevention of the reconstruction. You should use DFNN only for lines to external systems or if a node number reconstruction is not necessary due to the simplicity of the network. DFNN must always be used in combination with the TDCSU parameter NNO.

5.21.1.4 Number signaling

5.21.1.4.1 Destination and information numbers: The general modification method

The numerous numbers in a network can basically be divided into two categories:

1) The numbers which describe the destination (e.g. the B subscriber of the "called number")

2) The numbers provided as additional information (e.g. information on the A subscriber of the "calling number" or the forwarding subscriber in the "redirecting number" o. "last rerouting number")

Numbers of the first category are handled by WABE and LCR and modified accordingly. Here, they should generally be called "destination numbers." By contrast, numbers of the second category are modified using AMO KNMAT, AMO KNPRE, AMO KNFOR, and AMO KNDEF. The "information numbers" modified in this manner are called "calling numbers" in this document. The modification method itself is designated by the term "INS" (Info Number Signaling). For many features, the number previously specified as additional information is used as the destination number in a later procedure (e.g. stored number redial, callback, etc.). For this reason, it is the objective of the INS to treat the number in such a way the point it is addressing can be called at any time and place in the network.

RULE:

The information numbers must always be modified in such away that the point they are addressing can be reached from any transmitting location in the network and at any time!

5.21.1.4.2 The influence of LCR on Info Number Signaling (INS)

The NPI and TON parameters in the LCR outdial rules

Both methods of number modification - LCR and INS - are basically different, but cannot be observed separately from each other. LCR thus ultimately decides on the route of a call and thus on the numbering plan to be used (AMO LODR with the NPI command). Since the numbering plan demanded by the destination number for a certain route also corresponds to that of the information numbers by default (e.g. in case of a CO exit, all numbers must be from the NPI=ISDN numbering plan), the numbering plan of the destination numbers from LCR is also used for the information numbers. The other information such as TON and screening indicator is either derived from the node format table (set with AMO KNFOR) or set by default and thus determined independent of LCR.

RULE:

If numbering plans not equal to NPI=UNKNOWN are used in a node, each route element (AMO LDAT) is to be assigned the respective numbering plan (NPI) and the type belonging to the destination number (TON) in the corresponding outdial rule (AMO LODR).

The destination node number in AMO RICHT

In AMO RICHT, a virtual destination node number and a physical destination node number must be defined. The virtual destination node number is used for number modification and, for example, also displayed in charge tickets. The physical destination node number is mainly used for the closed numbering of the assignment of subscribers with destination numbers to destination node number.

If a node has a partner node that hides several virtual nodes, a route must be defined for every virtual node. In the dial plan (AMO LDPLN), entries must be made in such a way that the right virtual destination node can be addressed. In extreme cases, complete numbers including the extension must be configured to guarantee the assignment of subscribers to various virtual nodes (NNO).

Example: In PABX 1, Subscriber 4711 is administered in VKN 1 and thus available with tie line code 777. Subscriber 4712 is also in VKN 1, but administered in PABX 2. This situation may have arisen due to a move of Subscriber 2 from PABX 1 to PABX 2 while keeping the numbers. VKN 1 thus extends to two physical nodes. In the partner node PABX 3, the dial plan entry must take place as follows: The digit pattern "777 4711" is assigned to Route 1 with DNNO = VKN1, while the digit pattern "777 4712" is assigned to Route 2 with DNNO = VKN2.

The destination node number in AMO LDAT

The virtual destination node number entered in AMO RICHT always describes the remote destination, i.e. the end point of a call. Since no differentiation dependent on the distance is possible here, however, a destination node number that is valid for a certain route is entered in AMO LDAT. The LDAT and not the RICHT destination node number is thus used for the modification. This could be the case, for example, if rerouting takes place via the central office for an originally network-internal call. In the rerouting node, the central office or a fictive node number that deviates from AMO RICHT can be entered as the destination node - dependent on route - thus resulting in an accordingly different reaction.

IMPORTANT: Normally, you do not have to enter a virtual destination node number in AM LDAT.

The LATTR=SUPPCPN attribute in AMO LDAT

If a number is to be transferred from one numbering plan to another, this is a case of "Transit Interworking." This transfer takes place by placing the codes of the new numbering plan before the original number (implicit format). An explicit number of 89-722-99-4711 with NPI=ISDN and TON=NATIONAL, for example, thus arises from number 99-4711 with NPI=UNKNOWN and TON=UNKNOWN (OpenScape 4000 specific numbering plan) for a transfer to the ISDN CO numbering plan. Since various problems can arise with this method (e.g. a central office does not accept the number since 99-4711 does not come from the assigned group of numbers), the signaling of the information numbers can be entirely prevented in such a linkage case by setting LATTR=SUPPCPN (no display of A subscribers) in LDAT for certain routes. Instead, a permanent, substitute number set by AMO KNMAT (e.g. attendant console number) can be sent instead.

IMPORTANT: The SUPPCPN parameter may not be used in connection with confidential numbers or the suppression of A numbers since a suppression takes place only in case of transit interworking!

5.21.1.4.3 Info Number Signaling (INS)

The INS has the objective of modifying a number specified as information ("calling number") in such a way that this number reaches the point that it addresses again and again as a destination number from any place in the network and at any time. For this purpose, the number, which was originally available as a DID number (e.g. 4711) must be replaced with the corresponding codes.

This modification can basically take place in two ways:

1) On the one hand, it can take place using AMO KNMAT and AMO KNFOR depending on source and destination.
2) On the other hand, a modification can take place only on the basis of the actual and set numbering formats with AMO KNPRE, AMO KNFOR, and AMO KNDEF (format-dependent modification) through the use of explicit numbers. The second method has the decisive advantage that the network administration usually does not have to have detailed knowledge of the network topology.

The selection of one of the two methods depends on the entries in the AMO KNMAT of the corresponding numbering plan for the current source/destination relationship. If AMO KNMAT has an entry with a valid modification condition, the AMO KNMAT modification will always be performed. If no entry exists, the format-dependent modification is taken into account.

Source/destination-dependent modification with AMO KNMAT

1) When is AMO KNMAT used for modification?

   A source/destination-dependent modification with AMO KNMAT and AMO KNFOR should take place whenever the numbers are implicit and cannot be converted into an explicit format due to their structure or whenever a destination node requires an implicit format. Since the OpenScape 4000 specific numbering plan always contains implicit numbers, all modifications regarding tie line codes must be settled using AMO KNMAT. For the NPI=ISDN and NPI=PRIVATE numbering plans, modification using AMO KNMAT makes sense only in exceptional cases.
2) What is the structure of the node connection matrix?

   The node connection matrix managed using AMO KNMAT is set up separately for each node number level and numbering plan. There are nine (3 levels x 3 numbering plans) KNMAT tables that are independent of each other. The selection of tables to be processed is oriented on the NPI and node number levels listed there for incoming numbers. In the case of outgoing numbers, the numbering plan to be selected depends on the destination number, i.e. on the LCR (AMO LODR), and the levels to be processed depend on the levels of the node numbers. Figure 51 shows the principle structure of the node connection matrices.

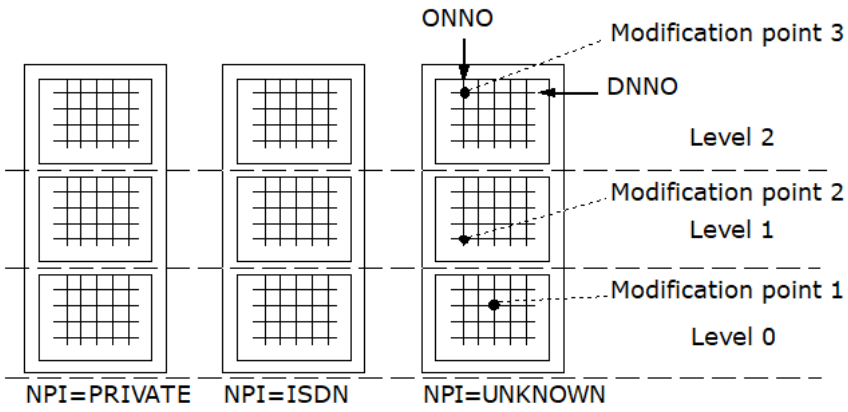


Figure 49: Modification matrices and modification points in a three-level network

3) How is the matrix processed?

In regard to the specific numbering plan, the KNMAT tables are always run through from the highest to lowest level (modification point 3->2->1) and all minus entries (abbreviation of digits) are processed. The tables are then processed from the lowest to the highest level (modification point 1->2->3), whereby all plus entries (supplementing of digits) are processed. Minus entries are deducted only if the correspond with the first part of the numbers. Plus entries, on the other hand, are always supplemented unless the number exceeds the maximum length of 22 digits.

In the case of multi-level KNMAT modification, it is very important to clarify that the node numbers are assigned to precisely one node only on Level 0 and that Levels 1 and 2 describe larger areas of nodes. A node with a physical node number of 1-2-5 in ZAND is clear within the network only with a three-digit node numbers (e.g. "1" for all nodes in Germany, "2" for all nodes in Munich, and "5" for precisely this node in Munich). In the KNMAT modification of this node for Node 1-2-6, however, the virtual node must always be observed, which means that Germany is modified to Germany (1 to 1) in Level 2, Munich to Munich (2 to 2) in Level 1, and Node 5 to Node 6 in Level 0.

4) Why were the modification conditions introduced?

To prevent ambiguities in the higher levels, AMO KNMAT has a modification condition parameter (MODCON). With this parameter, the entered modification can be executed only under certain conditions. These conditions can be derived from the desired traffic type. A modification can thus be performed only in case of outgoing terminating traffic (ABG), incoming terminating traffic (ANKE), transit under observance of the numbering plan (TRANSH), transit with a change of the numbering plan (TRANSI), never (NONE), or always (ALL) or in case of a combination of these conditions. If the supplementing of digits on Level 2 can thus take place only if the call comes from the node for which AMO KNMAT has been set up and not in a transit node on Level 2, the modification condition MODCON=OUT should be entered.

In combination with the subscriber-individual authorization DIDBLK (direct inward dialing blocking), the REPEXT special modification condition effects a complete replacement of the "calling number" by a substitute number. REPEXT and DIDBLK are always set whenever station numbers are not known to the central office so that they are replaced by an attendant console number, for example. In case of REPEXT without DIDBLK, the substitute number is also used, but the lower digits with the calling number are overwritten. An example can be found in the Service Manual the "EURO-ISDN CO Interface" chapter.

5) What are "logical" node numbers?

In addition to the actual area and node numbers of a level, AMO KNMAT has so-called logical node numbers. They were introduced to simplify administration, i.e. to minimize the number of entries in the matrix. The following logical node numbers exist:

- OWN: All own node or area numbers.

  After entry, the logical OWN node is directly converted into all really own node numbers (according to AMO KNDEF) and should act only as a simplified aid for the administrator. In connection with the logical entry ##### for NUMEXT/NUMRED, the corresponding node code is extracted

from AMO KNDEF under consideration of the skip digits for each virtual node number.

- ROW: Stands for all nodes/areas in the respective level (including the own node).

  The logical node ROW represents a new line or column in AMO KNMAT. If no entry for the precise source/destination relationship exists in the corresponding level and numbering plan or if the MODCON is incorrect, the real source/destination node is replaced by the logical node ROW and an entry is sought there. In the process, only one node number not equal to the own node number is replaced by ROW. Both node numbers are never replaced by ROW at the same time.
- CDR as special node for call data recording The logical node number CDR is taken into consideration only as a destination node number (parameter DNNOL) in the numbering plan UNKNOWN (parameter NPI). Here, the special modifications for the call data recording can be entered independently of the source node (MODCON=ALL). How the modification should take place is described in the "Call Data Recording" chapter and not dealt with further here.

6) How is the logical node ROW handled?

Example for the handling of ROW:

The connection from Node 100 to Node 200 should be established. No entry exists for ONNO/DNNO = 100/200. The KNMAT table is as follows:

```
-------------------------------------------------------------
NODE MATRIX FOR NPI = UNKNOWN, LEVEL = 0, OWN NNO = 100
-------------------------------------------------------------
 ONNO |DNNO |CONN|MODCON| NUMEXT               | NUMRED
 / ONNOL|/ DNNOL |      |                      |
              |
------+------+----+------+----------------------
+-------------------
  100 |ROW   | A   |ALL     | 99                | -
------+------+----+------+----------------------
+-------------------
  ROW |   100 | A   |ALL     | 55                | -
```

Result:	"99" is supplemented since there is no entry in 100/200 and the own NNO 100 is not replaced by ROW.
Remark:	A "0" in one of the lower levels of a node number in AMO (e.g. RICHT) is interpreted as ROW in AMO KNMAT if a clear number is contained in one of the higher levels.

IMPORTANT: A targeted entry with ONNO/DNNO always has priority before ROW!

7) How is the OWN logical node handled in connection with the modification conditions?

A modification can generally take place in an incoming and outgoing manner. For outgoing terminating traffic (MODCON=OUT), modification only takes place in an "outgoing" manner and in an "incoming" manner for incoming

terminating traffic (MODCON=IN). In transit traffic, homogeneous transit (MODCON=TRANSH) and transit interworking (MODCON=TRANSI) must be differentiated. To keep the number in the node as short as possible, ONNO will be modified to DNNOL=OWN when incoming in both cases. In TRANSH, the possibly previously abbreviated number is supplemented by these numbers again and then modified with ONNO/DNNO when outgoing. In TRANSI, the possibly previously abbreviated number is kept and modified with ONNOL=OWN to DNNO when outgoing.

8) How is a substitute number set?

If the parameter SUPPCPN is set in the LATTR of AMO LDAT (see Section), a substitute number can be set using AMO KNMAT. The applies in case of MODCON=TRANSI and is read from AMO KNMAT with ONNO/DNNO when outgoing.

9) How can the KNMAT modification be configured for the ISDN and PRIVATE numbering plans as well in case of exceptions?

If, in special cases, explicit numbers also have to be handled with AMO KNMAT when incoming, a pretreatment of the calling number is performed before the KNMAT modification. Every previously explicit number (e.g. 89 722 4711, NPI=ISDN, TON=NATIONAL) is converted into the respectively highest possible format (TON=INTERNAT) using AMO KNDEF and AMO KNPRE. All codes, the respective exit codes, and the prefixes are added (e.g. 0 00 49 0 0 89 0 722 4711). Now, an abbreviation of the desired code can take place using AMO KNMAT (e.g. in the ROW/OWN entry): -00049). Invalid exit codes and prefixes remaining in the number are removed by the program after modification (e.g. 0 0 89 722 4711).

In the case of the outgoing modification of numbers from the NPI=ISDN and NPI=PRIVATE numbering plans, the codes entered in AMO KNMAT must always be coordinated with AMO KNFOR.

Rules for KNMAT modification

RULE:

By default, the AMO KNMAT should be used only for the UNKNOWN numbering plan (NPI parameter). The NPI=ISDN and NPI=PRIVATE numbering plans should be handled using format-dependent modification (see Section)!

RULE (Important !):

By default, only the logical node numbers OWN and ROW should be used in AMO KNMAT for the UNKNOWN numbering plan. The following rule applies: in ONNOL=ROW to DNNOL=OWN, the own node code is abbreviated when incoming and, in ONNOL=OWN to DNNOL=ROW, the own node code is supplemented when outgoing. The specification of the own node code can also be shown in logical format (#####).

The numbers in the source node are thus brought to the highest possible format and those in the destination node to the lowest possible format. This applies both for closed and open numbering (the area code applies in case of closed numbering). This requires that each node in the network can be reached with precisely one node code!

RULE:

The special rules for areas are suspended. The exceptions are areas in which the full subscriber number of the other nodes are not set up in WABE. Further,

an entry must be made on the 45 line in AMO KNMAT (ONNO = DNNO) for all nodes of the area in this case.

RULE:

When multi-level node numbers are used, the entry of the codes in AMO KNMAT must always take place at the corresponding level; that is, a country code (e.g. 49) is always at Level 2, an area code (e.g. 89) is always at Level 1, and a local destination code (e.g. 722) is always at Level 0.

RULE:

If an external mode cannot be modified itself and is number openly to the own node, the missing codes must be set using AMO KNMAT. In the process, the numbers in AMO KNMAT of the respective numbering plan must be supplemented from ONNO to DNNOL=OWN (MODCON=IN). If the node also sends no node number, the set for this node must refer to the COT parameter LWNC and the node number of the external node (parameter NNO) must be entered in TDCSU.

Format-dependent modification

1) What is format-dependent modification?

Format-dependent modification offers the opportunity to convert an incoming number (calling number) in any format automatically using the codes in AMO KNDEF to a certain destination format (AMO KNFOR).

This modification method is configured with AMO KNPRE, AMO KNFOR, and AMO KNDEF. It is possible only for the processing of explicit numbers. Since this is the case by default, however, at least in the NPI=ISDN and NPI=PRIVATE numbering plans, the use of format-dependent modification should always be preferred to source/destination-dependent modification in this case.

2) How is the format-dependent modification configured?

The modification takes place as follows:

- The entry of the corresponding code in AMO KNDEF.
- The setting of the node prefix table using AMO KNPRE. Here, you can set the prefixes belonging to the NPI/TON combination and the exit code. This enables a conversation from explicit to implicit numbers and vice versa.
- The setting of the node format table using AMO KNFOR. The TON entry in KNFOR decides on the format of the number. Since, in the case of overlapping nodes for a virtual node number, it is no longer clear whether the node in question is the part of the overlapping virtual node on the actual physical node or whether it is the part of the overlapping virtual node on another physical node, two TON parameters are introduced: TONIN and TONOUT:

  TONIN or rather, a KNFOR entry on the own node (DNNO=own node number), determines the display format of the number for all telephones on this node (e.g. displays). If no entry exists here, the number is always converted to the lowest possible format (e.g. only the DID number TON=UNKNOWN). An entry with TON=NATIONAL, for example, has the effect that the calling number is always displayed in the national format (e.g. 0 089 722 4711).

  TONOUT or, rather, a KNFOR entry with any number of destination nodes in the network, determines the number format, i.e. the TON, for

precisely these nodes. If no entry exists, the highest possible format (e.g. TON=INTERNAT) is taken as the default.

If TON=UNKNOWN is entered in KNFOR, the number for the corresponding destination node must be implicit. Here, no format-dependent modification is performed, but rather only the entries in AMO KNMAT are processed.

Rules for format-dependent modification

RULE:

The format-dependent modification is set up using AMO KNDEF. The entry of codes to trunks is no longer required.

RULE:

In each node that can be addressed with numbering plan NPI=ISDN or NPI=PRIVATE, all prefixes and exit code should be set up for the possible numbering plans using AMO KNPRE!

RULE:

The node format table (AMO KNFOR) should always be set up when external nodes require a certain format of the numbers or if the subscribers require a certain display format on their own node. If KNFOR is not set up, the calling number is brought to the highest format (e.g. TON=INTERNAT) when incoming and the lowest format (TON=UNKNOWN) when outgoing by default!

RULE:

For lines through which numbers with prefixes but without an exit are transferred (e.g. 089 722 4711), the ISDNIP and ISDNNP parameters must continue to be configured in AMO TDSCU. No prefixes may be set at tie lines through which OpenScape 4000 specific numbers are transferred as well. Prefixes for the conversion of normal, implicit numbers (e.g. 0 089 722 47110) into normal, explicit numbers are to be set in AMO KNPRE.

5.21.2 Examples for the configuration of the number modification

The following abbreviations are used in the following:

- PNNO: A physical node number
- NNO: A virtual node number
- PNODECD: A physical node code
- NODECD: A virtual node code
- FVNNO: A fictive virtual node number

5.21.2.1 One-level network (only Level 0)

5.21.2.1.1 Closed-numbered area with digital ISDN CO connection

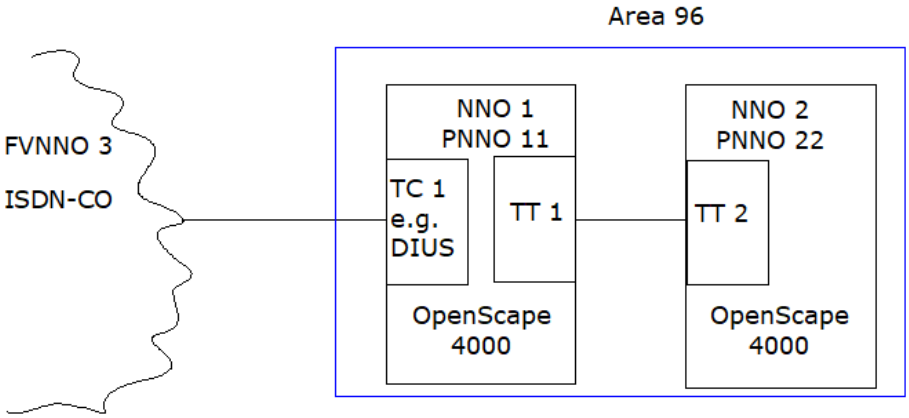


Figure 50: Example: Closed-numbered area with digital ISDN CO connection

A closed-numbered area consisting of Nodes 1 and 2 through which the digital trunk circuit TC1 is connected to an ISDN-CO is located in Figure 52. The fictive node number 3 was assigned to the central office. Both OpenScape 4000 nodes are connected via tie trunks QS1/QS2:

In the example, the format-dependent number modification configured with AMO TDCSU, AMO KNFOR, AMO KNDEF, and AMO KNPRE should be effective.

IMPORTANT: With AMO KNMAT, no modification should be set in this case.

Configuration in physical node 11

Configure the physical node with PNNO=11 as follows:

- Set the node table (define the virtual own NNO):

```
ADD-KNDEF:NNO=1,TYPE=OWN,ISDNCC=49,ISDNAC=89,
ISDNLC=722,ISDNSK=3,ISDNUL=EXT,NODECD=96;
```

- Set the node prefix table:

```
ADD-KNPRE:DPLN=0,NPI=ISDN,TON=INTERNAT,EXIT=0,PREFIX=00;

ADD-KNPRE:DPLN=0,NPI=ISDN,TON=NATIONAL,EXIT=0,PREFIX=0;

ADD-KNPRE:DPLN=0,NPI=ISDN,TON=SUBSCR,EXIT=0;
```

- Set the central system data:

```
CHANGE-ZAND:TYPE=ALLDATA,PNNO=11, PNODECD=888811;
```

- Set the digital trunk circuit:

```
ADD-BUEND:NO=30,TGRP:=44;

ADD-TDCSU:OPT=NEW,DEV=VCCOD,BCGR=1,COTNO=11,COPNO=2,
TGRP=44,LCOSV=1, LCOSD=1,PROTVAR=EDSGER,NNO=3,ISDNIP=00,
ISDNNP=0;
```

- LCR route configuration:

  With AMO RICHT, you can set up LCR routes for the central office and tie line according to the "LCR Description." Enter 3 as the destination node for the CO route and 2 as the destination node for the tie line route.

  ```
  ADD-RICHT:MODE=LRTENEW,LRTG=710,LSVC=ALL,TGRP=44,DNNO=3;
  ```

  With AMO LODR, you can configure the outdial rules for CO connections. In outdial rule 10 for the CO route, numbering plan NPI=ISDN and the TONs for the called numbers must be included (UNKNOWN in this example). The NPI numbering plan, which is always determined from the LCR, is important for the modification of the calling number.

  ```
  ADD-LODR:ODR=10,CMD=ECHO,FIELD=2;

  ADD-LODR:ODR=10,CMD=NPI,NPI=ISDN;

  ADD-LODR:ODR=10,CMD=TON,TON=UNKNOWN;

  ADD-LODR:ODR=10,CMD=END;
  ```

  The outdial rule is assigned to the route elements using AMO LDAT.

  ```
  ADD-
  LDAT:LROUTE=710,LSVC=ALL,LVAL=1,TGRP=44,ODR=10,LAUTH=1;
  ```

  With AMO WABE, enter the routing code into the dial pattern plan:

  ```
  ADD-WABE:CD=0,DAR=TIE;
  ```

  With AMO LDPLN, enter the route elements into the dial pattern plan:

  ```
  ADD-LDPLN:LDP=0-X,DPLN=0,LROUTE=710,LAUTH=1;
  ```

- Set the node format table:

  1) Normally, the node format table must not be set. In this case, the "calling number" is always sent to the central office in international format.
  If the central office wants a national number with the test attribute SCRE=NOTDEF, enter the following command:

  ```
  ADD-
  KNFOR:DNNO=3,NPI=ISDN;,TONOUT=NATIONAL,SCRE=NOTDEF;
  ```

  The NPI parameter in AMO KNFOR is the selection parameter. The NPI is determined from the LCR outdial rule (AMO LODR).

  2) Without setting the node format table with DNNO=1 (own node), the "shortest" possible number is displayed for the subscribers connected to Node 1 in case the subscriber is called from the central office. The extent of the shortening is determined by the codes set by AMO KNDEF (see above). If the calling number should always be displayed in a certain format (e.g. international) for the subscriber, enter the following command:

  ```
  ADD-KNFOR:DNNO=1,NPI=ISDN;,TONIN=INTERNAT;
  ```

  Please observe that, for this function, the own node should be entered as the destination node. In this example of the closed-numbered subsystem (NNO 2) without the CO connection, this number format also applies in Node 2.

Configuration in physical node 22

Configure the physical node with PNNO=22 as follows:

- Set the node table (define the virtual own NNO):

  ```
  ADD-KNDEF:NNO=2,TYPE=OWN,ISDNCC=49,ISDNAC=89,
  ISDNLC=722,ISDNSK=3,ISDNUL=EXT,NODECD=96;
  ```

- Set the central system data:

  ```
  CHANGE-ZAND:TYPE=ALLDATA,PNNO=22, PNODECD=888822;
  ```

  Since Node 22 has no CO connection and is addressed in a cross-closed-numbered manner, no number modification must be configured. For this reason, the specification of NIP in the LCR outdial rule is no longer necessary:

  ```
  ADD-LODR:ODR=10,CMD=ECHO,FIELD=1;

  ADD-LODR:ODR=10,CMD=ECHO,FIELD=2;

  ADD-LODR:ODR=10,CMD=END;
  ```

  The LCR route, route elements, and dial pattern plan are configured as in Node 1. The tie trunk group is assigned for CO lines as the trunk group.

- AMO KNPRE and AMO KNFOR are not called in Node 2.

5.21.2.1.2 Closed-numbered area with analog CO connection

The system configuration corresponds to that shown in Figure 52 with the exception that no digital or analog CO connection exists. Numbers can be transferred, e.g. in case of MFC (multi-frequency code) lines (see AMO TACSU, AMO MFCTA).\

In this case, no format-dependent modification can be configured (reason: NPI/TON are not transferred) so that you must set all modifications with AMO KNMAT or AMO MFCTA. In this case, the numbering plan is always UNKNOWN. In this example, no number modification is set in the MFC table.

Configuration in physical node 11

The node prefix and node format tables are not set.

- Set the analog trunk circuit:

  ```
  ADD-TDCSU:DEVTYPE=...,COTNO=11,COPNO=2,TGRP=44,
  LCOSV=1,LCOSD=1,NNO=3;
  ```

- Configure the LCR route:

  LCR is configured as shown in Section . The outdial rule defined using AMO LODR, however, must be different since NPI is always UNKNOWN.

  ```
  ADD-LODR:ODR=10,CMD=ECHO,FIELD=2;

  ADD-LODR:ODR=10,CMD=END;
  ```

- Set the node connection matrix:

  Incoming from the central office, the calling number is supplemented by the exit code 0 in Node 1. This happens if the connection for a subscriber

is established at Node 1, but also for connections to subscribers at other nodes.

Toward the central office, the number of the main connection is placed before the pure station number at exit node 1 of the calling number so that a correct CO number is provided to the central office.

```
CHANGE-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=OWN&ROW,
DNNO=3,NUMEXT=089722;

CHANGE-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNO=3,
DNNOL=OWN&ROW,NUMEXT=0;
```

The following setting results:

```
-------------------------------------------------------------------
NODE MATRIX FOR NPI = UNKNOWN, LEVEL = 0, OWN NNO = 1
-------------------------------------------------------------------
  ONNO  |DNNO  |CONN|MODCON| NUMEXT                        |
 NUMRED
      / ONNOL|/ DNNOL|    |      |                          |

------+------+----+------+-----------------------------
+----------
    1 |    3 | A  |ALL   | 089722                        |
 -
------+------+----+------+-----------------------------
+----------
    3 |    1 | A  |ALL   | 0                             |
 -
    3 |ROW   | A  |ALL   | 0                             |
 -
------+------+----+------+-----------------------------
+----------
  ROW |    3 | A  |ALL   | 089722                        |
 -
```

Configuration in physical node 2

In closed-numbered Node 2, no special setting is required for the number modification.

5.21.2.1.3 Closed-numbered area with CO connection and subsystems

There is no difference between Section 41.2.1.1, "Closed-numbered area with digital ISDN CO connection" and Section 41.2.1.2, "Closed-numbered area with analog CO connection" for the configuration of the number modification.

5.21.2.1.4 Mixed-numbered network with digital ISDN trunk access points

In this example (Figure 53), the network consists of a closed-numbered area in Berlin and an open-numbered node in Munich with digital trunk access points.

In the ISDN numbering plan, the format-dependent number modification that can be configured using AMO KNDEF, AMO KNFOR, and AMO KNPRE is selected. For the open numbering in the OpenScape 4000 internal numbering plan UNKNOWN, the number modification must be set with AMO KNMAT.

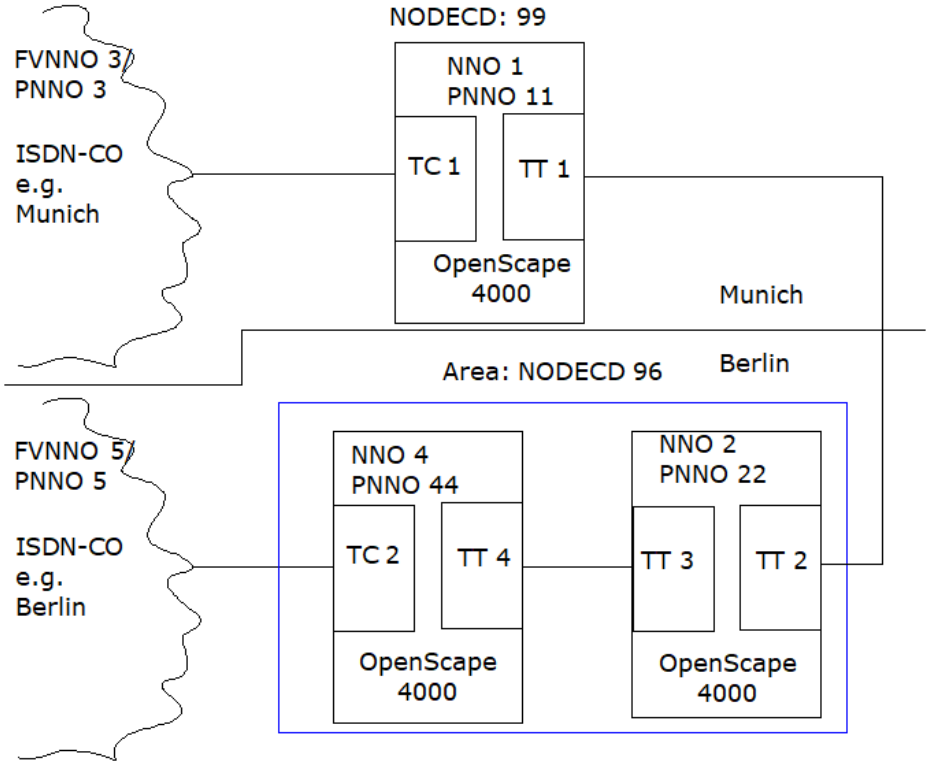


Figure 51: Example: Mixed-numbered network with digital ISDN trunk access points

Configuration in physical node 11

Trunk calls to Berlin should not already be routed to the central office in Munich, but rather via the tie line to Berlin.

Since ISDN connections can also come in via the tie trunk during transit, you must make the ISDN-specific settings here as well.

You can configure the node with PNNO=11 as follows:

- Set the node table:

```
ADD-KNDEF:NNO=1,TYPE=OWN,ISDNCC=49,ISDNAC=89,
ISDNLC=722,ISDNSK=3,ISDNUL=EXT,NODECD=99;

CHANGE-KNDEF:NNO=1,DFLT=Y;
```

- Set the own node code in the WABE:
  `ADD-WABE:CD=99,DAR=OWNNODE;`
- Set the node prefix table:

```
ADD-KNPRE:DPLN=0,NPI=ISDN,TON=INTERNAT,EXIT=0,PREFIX=00;

ADD-KNPRE:DPLN=0,NPI=ISDN,TON=NATIONAL,EXIT=0,PREFIX=0;

ADD-KNPRE:DPLN=0,NPI=ISDN,TON=SUBSCR,EXIT=0;
```

- Set the central system data:

```
CHANGE-ZAND:TYPE=ALLDATA,PNNO=11, PNODECD=888811;
```

- Set the digital trunk circuit TC1 (important parameter):

```
ADD-BUEND:NO=30,TGRP:=44;

ADD-TDCSU:OPT=NEW,DEV=VCCOD,BCGR=1,COTNO=11,COPNO=2,
TGRP=44,LCOSV=1, LCOSD=1,PROTVAR=EDSGER,NNO=3,ISDNIP=00,
ISDNNP=0;
```

- Set the digital tie trunk TT1 (important parameter):

  The node number does not have to be specified since it is transferred in this protocol.

```
ADD-BUEND:NO=30,TGRP=55;

ADD-TDCSU:OPT=NEW,DEV=S2CONN,BCGR=1,COTNO=11,COPNO=2,
TGRP=55,LCOSV=1, LCOSD=1,PROTVAR=ECMA1;
```

- LCR route configuration:

  With AMO RICHT, you can set up LCR routes for the central office and tie line according to the LCR description.

```
ADD-
RICHT:MODE=LRTENEW,LRTE=700,LSVC=ALL,TGRP=44,DNNO=3; /*
CO */

ADD-
RICHT:MODE=LRTENEW,LRTE=701,LSVC=ALL,TGRP=55,DNNO=5; /*
Central office over tie line */

ADD-
RICHT:MODE=LRTENEW,LRTE=702,LSVC=ALL,TGRP=55,DNNO=5; /*
Central office over tie line */

ADD-
RICHT:MODE=LRTENEW,LRTE=711,LSVC=ALL,TGRP=55,DNNO=2; /*
TIE */
```

  With AMO LODR, you can configure outdial rules for CO and tie line connections. Outdial rule 10 is applied to international numbers in tie line traffic, outdial rule 11 to national numbers in tie line traffic, and outdial rule 12 to direct CO traffic. Outdial rule 13 is intended for pure tie line traffic. The NPI numbering plan, which is always determined from the LCR, is important for the modification of the calling number. The TON is used only for the called number.

```
ADD-LODR:ODR=10,INFO="CO OVER TIE LINE INTERNAT.";

ADD-LODR:ODR=10,CMD=ECHO,FIELD=3;

ADD-LODR:ODR=10,CMD=ECHO,FIELD=4;

ADD-LODR:ODR=10,CMD=NPI,NPI=ISDN;

ADD-LODR:ODR=10,CMD=TON,TON=INTERNAT;

ADD-LODR:ODR=10,CMD=END;

ADD-LODR:ODR=11,INFO="CO OVER TIE LINE NAT.";

ADD-LODR:ODR=11,CMD=ECHO,FIELD=3;
```

```
ADD-LODR:ODR=11,CMD=ECHO,FIELD=4;

ADD-LODR:ODR=11,CMD=NPI,NPI=ISDN;

ADD-LODR:ODR=11,CMD=TON,TON=NATIONAL;

ADD-LODR:ODR=11,CMD=END;

ADD-LODR:ODR=12,INFO="CO";

ADD-LODR:ODR=12,CMD=ECHO,FIELD=2;

ADD-LODR:ODR=12,CMD=NPI,NPI=ISDN;

ADD-LODR:ODR=12,CMD=TON,TON=UNKNOWN;

ADD-LODR:ODR=12,CMD=END;

ADD-LODR:ODR=13,INFO="TIE";

ADD-LODR:ODR=13,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=13,CMD=ECHO,FIELD=2;

ADD-LODR:ODR=13,CMD=END;
```

The outdial rules are assigned to the route elements with AMO LDAT.

```
ADD-
LDAT:LROUTE=700,LSVC=ALL,LVAL=1,TGRP=44,ODR=12,LAUTH=1;

ADD-
LDAT:LROUTE=701,LSVC=ALL,LVAL=1,TGRP=55,ODR=10,LAUTH=1;

ADD-
LDAT:LROUTE=702,LSVC=ALL,LVAL=1,TGRP=55,ODR=11,LAUTH=1;

ADD-
LDAT:LROUTE=711,LSVC=ALL,LVAL=1,TGRP=55,ODR=13,LAUTH=1;
```

With AMO LDPLN, enter the route elements into the dial pattern plan:

```
ADD-LDPLN:LDP=0-X,DPLN=0,LROUTE=700,LAUTH=1;/* Central
 office
*/

ADD-LDPLN:LDP=0-00-4930-X,DPLN=0,LRTE=701,LAUTH=1;/*
 Central
office over tie line internat. */

ADD-LDPLN:LDP=0-0-30-X,DPLN=0,LROUTE=702,LAUTH=1; /*
 Central
office over tie line national */

ADD-LDPLN:LDP=96-X,DPLN=0,LROUTE=711,LAUTH=1; /* TIE */
```

- Set the node format table:

  The node format table can be set as described in Section .

- Set the node connection matrix:

  For the ISDN numbering plan, format-dependent number modification was selected in this example. The node connection matrix can thus not be set for NPI=ISDN.

  For the UNKNOWN numbering plan (i.e. the OpenScape 4000 specific numbering plan), the modifications must be configured for open numbering. Using AMO KNMAT, you must thus set the matrix in such a way that the outgoing calling number is always supplemented with the own node code. In case of incoming connections that end at Node 1, the number is shortened by its own node code.

  ```
  CHANGE-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=OWN,DNNOL=ROW,
  NUMEXT=#####;

  CHANGE-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=ROW,DNNOL=OWN,
  NUMRED=#####;
  ```

  The following setting results:

  ```
  ------------------------------------------------------------
  NODE MATRIX FOR NPI = UNKNOWN, LEVEL = 0, OWN NNO = 1
  ------------------------------------------------------------
    ONNO  |DNNO  |CONN|MODCON| NUMEXT                 |
   NUMRED
  / ONNOL|/ DNNOL|   |      |                        |
  ------+------+----+------+------------------------
  +----------
      1 |ROW   | A  |ALL   | 99                     | -
  ------+------+----+------+------------------------
  +----------
    ROW |    1 | A  |ALL   | -                      | 99
  ```

Configuration in physical node 22

Trunk calls to Munich should not already be routed to the central office in Berlin, but rather via the tie line to Munich.

Since ISDN connections can also come in via the tie trunk during transit, you must make the ISDN-specific settings here as well.

Configure the virtual node with PNNO=2 as follows:

- Set the node table:
  ```
  ADD-KNDEF:NNO=2,TYPE=OWN,ISDNCC=49,ISDNAC=30,
  ISDNLC=611,ISDNSK=3,ISDNUL=EXT,NODECD=96;NODECDSK=2;

  CHANGE-KNDEF:NNO=2,DFLT=Y;
  ```
- Set the own area code in WABE:
  ```
  ADD-WABE:CD=96,DAR=OWNNODE;
  ```
- Set the node prefix table:
  ```
  ADD-KNPRE:DPLN=0,NPI=ISDN,TON=INTERNAT,EXIT=0,PREFIX=00;

  ADD-KNPRE:DPLN=0,NPI=ISDN,TON=NATIONAL,EXIT=0,PREFIX=0;

  ADD-KNPRE:DPLN=0,NPI=ISDN,TON=SUBSCR,EXIT=0;
  ```

- Set the central system data:
  ```
  CHANGE-ZAND:TYPE=ALLDATA,PNNO=22, PNODECD=888822;
  ```
- Set the digital tie trunk TT2 (TGRP=55), TT3 (TGRP=66):

  The node number does not have to be specified since it is transferred in this protocol.
  ```
  ADD-BUEND:NO=30,TGRP=55;

  ADD-BUEND:NO=30,TGRP=66;

  ADD-
  TDCSU:OPT=NEW,DEV=S2CONN,BCGR=1,COTNO=11,COPNO=2,TGRP=55,
  LCOSV=1, LCOSD=1,PROTVAR=ECMA1; /* most important
   parameter */

  ADD-
  TDCSU:OPT=NEW,DEV=S2CONN,BCGR=1,COTNO=11,COPNO=2,TGRP=66,
  LCOSV=1, LCOSD=1,PROTVAR=ECMA1; /* most important
   parameter */
  ```
- LCR route configuration:

  With AMO RICHT, you can set up LCR routes for the central office and tie line according to the LCR description.

  ```
  ADD-RICHT:MODE=LRTENEW,LRTE=700,LSVC=ALL,TGRP=66,DNNO=5;
  /* CO */

  ADD-RICHT:MODE=LRTENEW,LRTE=701,LSVC=ALL,TGRP=55,DNNO=3;
  /* CO OVER TIE*/

  ADD-RICHT:MODE=LRTENEW,LRTE=702,LSVC=ALL,TGRP=55,DNNO=3;
  /* CO OVER TIE*/

  ADD-RICHT:MODE=LRTENEW,LRTE=711,LSVC=ALL,TGRP=55,DNNO=1;
  /* TIE */
  ```

  With AMO LODR, you can configure outdial rules for CO and tie line connections. Configure the outdial rules with AMO LODR in the exact same manner as in Node 1 (outdial rules 10 to 13 in the example). Only the outdial rule for digit pattern 0-X changes:
  ```
  ADD-LODR:ODR=12,CMD=ECHO,FIELD=1;/* transfer 0 */

  ADD-LODR:ODR=12,CMD=ECHO,FIELD=2;

  ADD-LODR:ODR=12,CMD=NPI,NPI=ISDN;

  ADD-LODR:ODR=12,CMD=TON,TON=UNKNOWN;

  ADD-LODR:ODR=12,CMD=END;
  ```

  The outdial rule is assigned to the route elements using AMO LDAT.
  ```
  ADD-
  LDAT:LROUTE=700,LSVC=ALL,LVAL=1,TGRP=66,ODR=12,LAUTH=1;

  ADD-
  LDAT:LROUTE=701,LSVC=ALL,LVAL=1,TGRP=55,ODR=10,LAUTH=1;
  ```

```
ADD-
LDAT:LROUTE=702,LSVC=ALL,LVAL=1,TGRP=55,ODR=11,LAUTH=1;

ADD-
LDAT:LROUTE=711,LSVC=ALL,LVAL=1,TGRP=55,ODR=13,LAUTH=1;
```

With AMO LDPLN, enter the route elements into the dial pattern plan:

```
ADD-LDPLN:LDP=0-X,DPLN=0,LROUTE=700,LAUTH=1; /* CO */

ADD-LDPLN:LDP=0-00-4989-X,DPLN=0,LROUTE=701,LAUTH=1; /*
Central office over tie line internat. */

ADD-LDPLN:LDP=0-0-89-X,DPLN=0,LROUTE=702,LAUTH=1; /*
 Central
office over tie line national */

ADD-LDPLN:LDP=99-X,DPLN=0,LROUTE=711,LAUTH=1; /* TIE */
```

- Set the node format table:

  The node format table can be set as described in Section .

- Set the node connection matrix:

  Analogous to virtual node 1, you can configure virtual node 2 for open numbering in the OpenScape 4000 numbering plan. Instead of the node code, enter area code 96:

```
CHANGE-
KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=OWN,DNNOL=ROW,NUMEXT=#####;

CHANGE-
KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=ROW,DNNOL=OWN,NUMRED=#####;
```

  The following setting results:

```
-------------------------------------------------------------------
NODE MATRIX FOR NPI = UNKNOWN, LEVEL = 0, OWN NNO = 2
-------------------------------------------------------------------
  ONNO |DNNO |CONN|MODCON| NUMEXT                |
 NUMRED
/ ONNOL|/ DNNOL|   |      |                       |
------+------+----+------+-----------------------
+-----------------------
    2 |ROW    | A  |ALL   | 96                    | -
------+------+----+------+-----------------------
+-----------------------
  ROW | 2     | A  |ALL   | -                     | 96
```

Configuration in physical node 44

- Set the node table:

```
ADD-
KNDEF:NNO=4,TYPE=OWN,ISDNCC=49,ISDNAC=30,ISDNLC=611,ISDNSK=3,
ISDNUL=EXT,NODECD=96;NODECDSK=2;

CHANGE-KNDEF:NNO=4,DFLT=Y;
```

- Set the own area code in WABE:
  ADD-WABE:CD=96,DAR=OWNNODE;
- Set the node prefix table:

  ```
  ADD-KNPRE:DPLN=0,NPI=ISDN,TON=INTERNAT,EXIT=0,PREFIX=00;

  ADD-KNPRE:DPLN=0,NPI=ISDN,TON=NATIONAL,EXIT=0,PREFIX=0;

  ADD-KNPRE:DPLN=0,NPI=ISDN,TON=SUBSCR,EXIT=0;
  ```
- Set the central system data:
  CHANGE-ZAND:TYPE=ALLDATA,PNNO=44, PNODECD=888844;
- Set the digital trunk circuit TC2:

  ```
  ADD-BUEND:NO=30,TGRP=44;

  ADD-
  TDCSU:OPT=NEW,DEV=VCCOD,BCGR=1,COTNO=11,COPNO=2,TGRP=44,
  LCOSV=1,
   LCOSD=1,PROTVAR=EDSGER,NNO=5,ISDNIP=00,ISDNNP=0;
  ```
- Set the digital tie trunk TT4:

  Since ISDN connections can also come in via the tie trunk during transit, you must make the ISDN-specific settings here as well. The node number does not have to be specified since it is transferred in this protocol.

  ```
  ADD-BUEND:NO=30,TGRP=66;

  ADD-
  TDCSU:OPT=NEW,DEV=S2CONN,BCGR=1,COTNO=11,COPNO=2,TGRP=66,
  LCOSV=1,LCOSD=1,PROTVAR=ECMA1;
  ```
- LCR route configuration:

  With AMO RICHT, you can set the LCR routes according to the LCR description in the same manner as virtual node 2 for the central office and the tie line.

  With AMO LODR, you can configure outdial rules for CO and tie line connections. Configure the outdial rules with AMO LODR in the exact same manner as in Node 1 (outdial rules 10 to 13 in the example).

  Using AMO LDAT, you can assign the outdial rules to the route elements as shown in Node 1.

  With AMO LDPLN, enter the route elements into the dial pattern plan:

  ```
  ADD-LDPLN:LDP=0-X,DPLN=0,LROUTE=700,LAUTH=1; /* CO */

  ADD-LDPLN:LDP=0-00-4989-X,DPLN=0,LROUTE=701,LAUTH=1; /*

  Central office over tie line internat. */

  ADD-LDPLN:LDP=0-0-89-X,DPLN=0,LROUTE=702,LAUTH=1; /*
   Central
  office over tie line national */

  ADD-LDPLN:LDP=99-X,DPLN=0,LROUTE=711,LAUTH=1; /* TIE */
  ```
- Set the node format table:

  The node format table can be set as described in Section .

- Set the node connection matrix:

  Analogous to Node 1, you can configure Node 2 for open numbering in the OpenScape 4000 numbering plan. Instead of the node code, enter area code 96:

```
CHANGE-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=OWN,
DNNOL=ROW,NUMEXT=96;

CHANGE-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=ROW,
DNNOL=OWN,NUMRED=96;
```

  The following setting results:

```
---------------------------------------------------------------------
NODE MATRIX FOR NPI = UNKNOWN, LEVEL = 0, OWN NNO = 4
---------------------------------------------------------------------
  ONNO |DNNO    |CONN |MODCON| NUMEXT                  |
 NUMRED
/ ONNOL|/ DNNOL|     |      |                         |
-------+-------+-----+------+-------------------------
+------------------------
     4 |ROW     | A    |ALL    | 96                    |
 -
-------+-------+-----+------+-------------------------
+------------------------
   ROW | 4      | A    |ALL    | -                     |
 96
```

5.21.2.1.5 Source/destination-dependent number modification in the ISDN or PNP numbering plan

Normally, format-dependent number modification is configured for the ETSI-E.164 (ISDN) and PRIVATE (PNP) numbering plans using AMO KNPRE, AMO KNFOR, and AMO KNDEF. The reason for this is the simpler configuration, especially in case of later changes in the network.

In this example, the source/destination-dependent modification configured with AMO KNMAT should also be set for the ISDN and PNP numbering plans (in the example above, KNMAT was also used, but only for the UNKNOWN numbering plan, i.e. the open, OpenScape 4000 specific numbering).

For better understanding, the example refers to the ISDN numbering plan. For PNP, however, its numbering plan applies accordingly (with other exit codes, prefixes, and codes in AMO KNDEF and AMO KNPRE).

IMPORTANT: Source/destination number modification with AMO KNMAT should be applied for ISDN and PNP only in exceptional cases. Settings with KNMAT prevent format-dependent number modification.

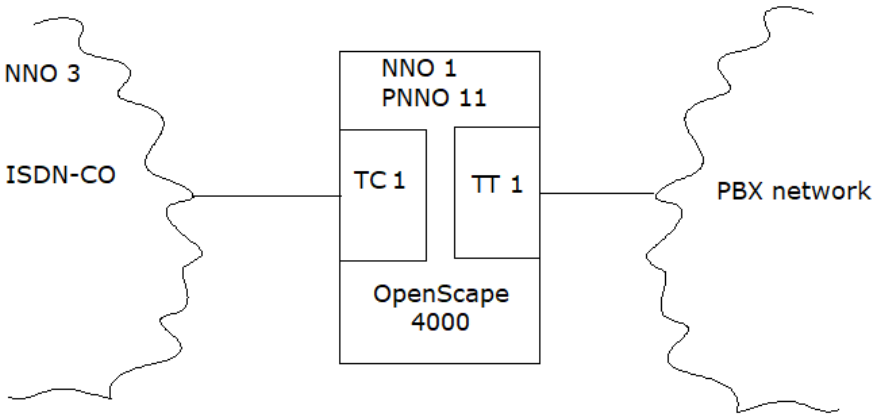


Figure 52: Example: Source/destination-dependent number modification in ISDN or PNP numbering plan

Configuration in physical node 11

- Set the node table:
  ```
  ADD-KNDEF:NNO=1,TYPE=OWN,ISDNCC=49,ISDNAC=30,
  ISDNLC=611,ISDNSK=3,ISDNUL=EXT,NODECD=96;NODECDSK=2;
  ```
- Set the node prefix table:

  Even though only the node connection matrix is used for the modification of the calling number in this example, you must set the exit codes and prefixes with AMO KNPRE due to the conversation from explicit to implicit numbers and vice versa:
  ```
  ADD-KNPRE:DPLN=0,NPI=ISDN,TON=INTERNAT,EXIT=0,PREFIX=00;

  ADD-KNPRE:DPLN=0,NPI=ISDN,TON=NATIONAL,EXIT=0,PREFIX=0;

  ADD-KNPRE:DPLN=0,NPI=ISDN,TON=SUBSCR,EXIT=0;
  ```
- Set the central system data:
  ```
  CHANGE-ZAND:TYPE=ALLDATA,PNNO=1;
  ```
- Set of the digital trunk circuit TC:
  ```
  ADD-BUEND:NO=30,TGRP=44;

  ADD-TDCSU:OPT=NEW,DEV=VCCOD,BCGR=1,COTNO=11,COPNO=2,
  TGRP=44,LCOSV=1,  LCOSD=1,PROTVAR=EDSGER,NNO=3,ISDNIP=00,
  ISDNNP=0;
  ```
- Set of the digital tie trunk TT1:

  The node number does not have to be specified if it is transferred in this protocol.
  ```
  ADD-BUEND:NO=30,TGRP=55;

  ADD-
  TDCSU:OPT=NEW,DEV=S2CONN,BCGR=1,COTNO=11,COPNO=2,TGRP=55,
  LCOSV=1,LCOSD=1,PROTVAR=ECMA1;
  ```

- LCR route configuration:

  With AMO RICHT, you can set up LCR routes as shown in the examples above.

  With AMO LODR, you can configure the outdial rule for CO connections:

```
ADD-LODR:ODR=12,CMD=ECHO,FIELD=2; /* CO */

ADD-LODR:ODR=12,CMD=NPI,NPI=ISDN;

ADD-LODR:ODR=12,CMD=TON,TON=UNKNOWN;

ADD-LODR:ODR=12,CMD=END;
```

  The outdial rule for tie line connections depends on whether the numbering is open or closed (see Chapter 36, "LCR (Least Cost Routing)").

  The outdial rules are assigned to the route elements with AMO LDAT.

  With AMO LDPLN, enter the route elements into the dial pattern plan:

```
ADD-LDPLN:LDP=0-X,DPLN=0,LROUTE=...,LAUTH=1; /* CO */
```

- Set the node format table:

  In this example, the central office should always demand a national number for the calling number. With AMO KNFOR, you thus make the following settings:

```
ADD-KNFOR:DNNO=3,NPI=ISDN;,TONOUT=NATIONAL,SCRE=NOTDEF;
```

- Set the node connection matrix:

  To be able to modify ISDN or PNP numbers using KNMAT, you must know which format the number had before it was subjected to modification when both incoming and outgoing:

  – The number of the incoming calling number contains exit codes and prefixes of the own node (Munich in the example; also see AMO KNPRE and AMO TDCSU). It always has an international, implicit format (e.g. 00049008907224711 for connections from Munich, 0004900303864711 for connections from Berlin, and 00041318184711 for connections from Zurich). With KNMAT, you can shorten the calling number by the superfluous part so that a dialable number remains (e.g. 07224711, 00303864711, 00041318184711).
  – The number of the outgoing calling number for connections from the own node have the format entered in WABE (e.g. 4711). It is converted to an explicit format via the modification. In this example, the central office in Munich demands a national number so that the number is supplemented with 89722.

IMPORTANT: If a certain format for a destination node is set using AMO KNFOR, you must convert the number to this format using the modification in AMO KNMAT.

IMPORTANT: In case of multi-level node numbers in a hierarchical network, enter the modification in the

corresponding levels of the KNMAT (e.g. shortening of 00049 to Level 2, 0089 to Level 1, 0722 to Level 0).

Commands:

```
CHANGE-
KNMAT:NPI=ISDN,LEVEL=0,ONNOL=OWN,DNNO=3,NUMEXT=89722;

CHANGE-KNMAT:NPI=ISDN,LEVEL=0,ONNOL=OWN,DNNOL=ROW,
NUMEXT=4989722;

CHANGE-KNMAT:NPI=ISDN,LEVEL=0,ONNO=3,DNNOL=OWN,
NUMRED=000490089;

CHANGE-KNMAT:NPI=ISDN,LEVEL=0,ONNOL=ROW,DNNOL=OWN,
NUMRED=00049;
```

The following setting results:

```
-------------------------------------------------------------------
NODE MATRIX FOR NPI = ISDN, LEVEL = 0, OWN NNO = 1
-------------------------------------------------------------------
  ONNO |DNNO    |CONN|MODCON| NUMEXT                    |
 NUMRED
/ ONNOL|/ DNNOL|    |      |                           |
-------+-------+----+------+--------------------------
+-----------
     1 |    3  | A  |ALL   | 89722                     |
 -
     1 |ROW    | A  |ALL   | 4989722                   |
 -
-------+-------+----+------+--------------------------
+-----------
     3 |     1 | A  |ALL   |                           |
 000490089
-------+-------+----+------+--------------------------
+-----------
   ROW |     1 | A  |ALL   |                           |
 00049
```

5.21.2.2 Multi-level network

The homogeneous OpenScape 4000/HiPath 4000 network in this example has a three-level structure. It consists of four physical nodes (system) and three fictive virtual nodes (trunk access points). The subscribers of all nodes can be reached through all three numbering plans; i.e. they have individual numbers for each numbering plan. This configuration can be preset when the OpenScape 4000/HiPath 4000 network is to be set up as the central office. Figure 55 shows the network topology.

In this example, the setup of three numbering plans is shown parallel. In practice, ISDN and PRIVATE are usually not configured together. The commands belonging to the unconfigured numbering plan are simply omitted.

IMPORTANT: In a multi-level network, you must pay attention to the correct modification conditions (MODCON) in the case of the KNMAT entries in the ambiguous Levels 1 and 2!

ZAND **PNNO** should be configured in line with the KNDEF node (i.e. same domain levels, but a different node ID), this is needed because ZAND **PNNO** is used as a reference point for number modification under some circumstances.

For example:

Redirection numbers will be modified with AMO KNMAT for all levels when the number is equal to the DAR length e.g. PSE/PSM codes - here number modification assumes the call forward is made to a local service so all levels will be modified with AMO KNMAT using ZAND **PNNO** as a reference point, to ensure the correct full redirection number is returned. Redirection numbers that are un-equal to a DAR result e.g. TIE+CODE, will only be modified for levels where there is a KNMAT entry match, here number modification assumes the user has programmed the call forward to a correct number meaning not all levels need to be modified.

5.21.2.2.1 Three-level, open-numbered network/one-level OpenScape 4000 specific numbering plan

In this example shown in Figure 55, the ISDN and PRIVATE numbers are also three-level according to the rule following the three-level node numbers. In the OpenScape 4000 specific numbering plan with tie line codes, however, where the numbers should be as short as possible, numbering usually continues to be one-level (e.g. one-level node code) if the numbers are unique within the network.

The local subscriber 4711 in Node 1-1-100, for example, is reached via the numbers:

- 19-4711 in the UNKNOWN numbering plan, whereby:

  19 = node code
- 0-00-49-89-722-4711 in the ISDN numbering plan (E.164), whereby:

  0 = exit code in the ISDN numbering plan 00 = international prefix 49 = country code (CC) 89 = area code (AC) 722 = local destination code (LC)

- 15-11-39-719-6051-4711 in the PRIVATE (PNP) numbering plan, whereby:

  15 = exit code in the PRIVATE numbering plan 11 = Level 2 prefix 39 = Level 2 code (L2C) 719 = Level 1 code (L1C) 6051 = local destination code (LC)

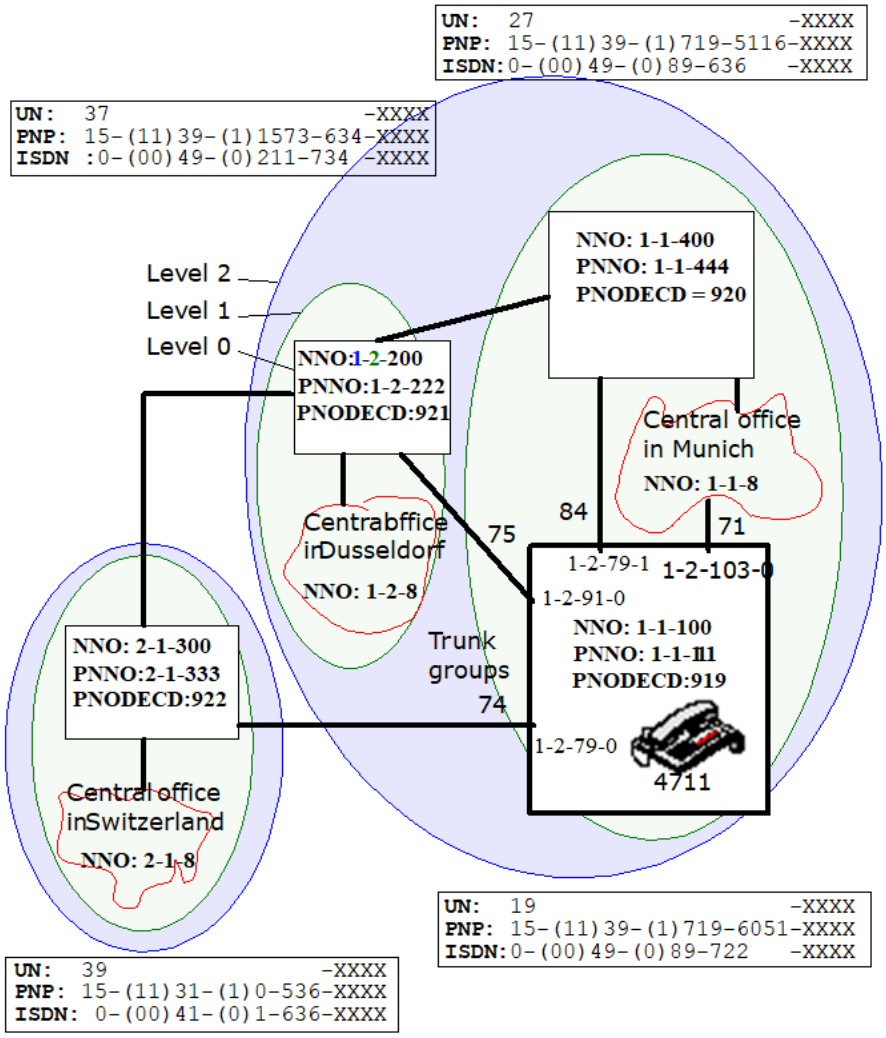


Figure 53: Example: Three-level network, node numbers, and numbers

Abbreviations: UN = UNKNOWN, PNP = PRIVATE (numbering plan), XXXX = Station number (1 - 6-digit, up to 8 digits in special configurations) Prefixes are specified in parentheses.

Configuration in physical node 1-1-111

> **IMPORTANT:** Normally, you must only perform modifications in the UNKNOWN numbering plan using KNMAT; the other numbers are controlled via format-dependent modification.

- Set the node table (with virtual node code):

```
ADD-
KNDEF:NNO=1-1-100,TYPE=OWN,ISDNCC=49,ISDNAC=89,ISDNLC=722,
```

```
ISDNSK=3,ISDNUL=EXT,PNPL2C=39,PNPL1C=719,PNPLC=6051,PNPSK=4,
PNPUL=EXT,NODECD=19,NODECDSK=2;

CHANGE-KNDEF:NNO=1-1-100,DFLT=Y;
```

- Set the node prefix table for both NPIs:

```
ADD-KNPRE:NPI=PRIVATE,TON=LEVEL2,EXIT=15,PREFIX=11;

ADD-KNPRE:NPI=PRIVATE,TON=LEVEL1,EXIT=15,PREFIX=1;

ADD-KNPRE:NPI=PRIVATE,TON=LOCAL,EXIT=15;

ADD-KNPRE:NPI=ISDN,TON=INTERNAT,EXIT=0,PREFIX=00;

ADD-KNPRE:NPI=ISDN,TON=NATIONAL,EXIT=0,PREFIX=0;

ADD-KNPRE:NPI=ISDN,TON=SUBSCR,EXIT=0;
```

- Enter the own node number in the ZAND data:

```
CHA-ZAND:TYPE=ALLDATA,PNNO:=1-1-111;
```

- Set the own physical code in WABE and in ZAND data:

```
ADD-WABE:CD=919,DAR=OWNNODE;

CHA-ZAND:TYPE=ALLDATA,PNODECD=919;
```

- Set the CO and PNP exit codes in WABE:

```
ADD-WABE:CD=0,DAR=TIE; /* CO */
 ADD-WABE:CD=15,DAR=TIE;
```

- Set tie line codes for NPI=UNKNOWN in WABE (for other nodes):

```
ADD-WABE:CD=27,DAR=TIE;
 ADD-WABE:CD=37,DAR=TIE;
 ADD-WABE:CD=39,DAR=TIE;
```

- Set trunk groups for direct CO connection:

```
ADD-BUEND:TGRP=71,NAME="AMT-DIU-S2 ",NO=60,RSV=NO;
```

- Set COT with LWNC for the central office:

```
ADD-
COT:COTNO=37,PAR=NLCR&ANS&COTN&NTON&IEVT&ICZL&IIDL&IVAC&INAU&
ITB&IDND&IFR&IDIS&LWNC,INFO="COT FOR CO";
```

- Set the trunk circuit:

```
ADD-
TDCSU:OPT=NEW,PEN=1-2-103-00,COTNO=37,COPNO=56,COS=1,
LCOSV=1,LCOSD=1,DESTNO=8,PROTVAR=EDSGER,BCNEG=Y,ISDNIP=00,
ISDNNP=0,PNPL2P=11,PNPL1P=1,NNO=1-1-8,DEV=S2COD,TGRP=71,
BCHAN=1&&30,BCGR=1,INS=Y,LWPAR=1;
```

- Set the tie trunks:

```
ADD-TDCSU:OPT=NEW,PEN=1-2-079-00,COTNO=20,COPNO=0,
 COS=1,
LCOSV=1,LCOSD=1,PROTVAR=ECMA1,DEV=S2CONN,TGRP=74,BCHAN=1&&30,
BCGR=1,ACT=Y,LWPAR=2,SEGMENT=2;

ADD-TDCSU:OPT=NEW,PEN=1-2-091-00,COTNO=20,COPNO=0,
 COS=1,
LCOSV=1,LCOSD=1,PROTVAR=ECMA1,DEV=S2CONN,TGRP=75,BCHAN=1&&30,
BCGR=1,ACT=Y,LWPAR=2,SEGMENT=2;
```

```
ADD-TDCSU:OPT=NEW,PEN=1-2-091-01,COTNO=20,COPNO=0,
 COS=1,
LCOSV=1,LCOSD=1,PROTVAR=ECMA1,DEV=S2CONN,TGRP=84,BCHAN=1&&30,
BCGR=1,ACT=Y,LWPAR=2,SEGMENT=2;
```

- You must set the node connection matrix only for the UNKNOWN numbering plan according to the rules in Section 41.2.1.5, "Source/destination-dependent number modification in the ISDN or PNP numbering plan".

  ```
  CHA-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=OWN,
  DNNOL=ROW,NUMEXT=#####;

  CHA-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=ROW,
  DNNOL=OWN,NUMRED=#####;
  ```

  The following setting results:

  ```
  ------------------------------------------------------------
  NODE MATRIX FOR NPI = UNKNOWN, LEVEL = 0, OWN NNO =
   1-1-100
  ------------------------------------------------------------
    ONNO |DNNO    |CONN|MODCON| NUMEXT                |
   NUMRED
  / ONNOL|/ DNNOL|    |      |                       |
  -------+------+----+------+-----------------------
  +----------
     100 |ROW    | A  |ALL   | 19                    | -
  -------+------+----+------+-----------------------
  +----------
     ROW |  100 | A  |ALL   | -                     | 19
  ```

- Set the node format table for CO node 1-1-8, which expects the calling number in international format and the screening indicator NETWPROV (network provided, i.e. the number is checked by the network):

  ```
  ADD-KNFOR:DNNO=1-1-8,NPI=ISDN,TONOUT=INTERNAT,
  SCRE=NETWPROV;
  ```

- Set the CO route with LCR:

  ```
  ADD-RICHT:MODE=LRTENEW,LRTE=20,LSVC=ALL,NAME="CO_S2",
  TGRP=71,DNNO=1-1-8,

  ADD-LODR:ODR=2,CMD=ECHO,FIELD=3;

  ADD-LODR:ODR=2,CMD=END;

  ADD-LDAT:LROUTE=20,LSVC=ALL,TGRP=71,ODR=2,LAUTH=1;

  ADD-LDPLN:LDP=0-W-X,LROUTE=20,LAUTH=1;
  ```

- Set the tie line routes, outdial rules, route elements, and dial pattern plan in LCR for the ISDN numbering plan:

  ```
  /* To Node 2-1-300 */

  ADD-RICHT:MODE=LRTENEW,LRTE=700,LSVC=ALL,NAME=ISDN,
  TGRP=74,DNNO=2-0-0;

  ADD-LODR:ODR=10,CMD=ECHO,FIELD=4;
  ```

```
ADD-LODR:ODR=10,CMD=ECHO,FIELD=5;

ADD-LODR:ODR=10,CMD=NPI,NPI=ISDN;

ADD-LODR:ODR=10,CMD=TON,TON=INTERNAT;

ADD-LODR:ODR=10,CMD=END;

ADD-
LDAT:LROUTE=700,LSVC=ALL,LVAL=1,TGRP=74,ODR=10,LAUTH=1;

ADD-LDPLN:LDP=0-W-00-41-X,LROUTE=700,LAUTH=1;
 /* To Node 1-2-200 */

ADD-RICHT:MODE=LRTENEW,LRTE=707,LSVC=ALL,NAME=ISDN,
TGRP=75,DNNO=1-2-0;

ADD-RICHT:MODE=LRTENEW,LRTE=708,LSVC=ALL,NAME=ISDN,
TGRP=75,DNNO=1-2-0;

ADD-LODR:ODR=11,CMD=ECHO,FIELD=4;

ADD-LODR:ODR=11,CMD=ECHO,FIELD=5;

ADD-LODR:ODR=11,CMD=NPI,NPI=ISDN;

ADD-LODR:ODR=11,CMD=TON,TON=NATIONAL;

ADD-LODR:ODR=11,CMD=END;

ADD-
LDAT:LROUTE=707,LSVC=ALL,LVAL=1,TGRP=75,ODR=10,LAUTH=1;

ADD-
LDAT:LROUTE=708,LSVC=ALL,LVAL=1,TGRP=75,ODR=11,LAUTH=1;

ADD-LDPLN:LDP=0-W-00-49211-X,LROUTE=707,LAUTH=1;

ADD-LDPLN:LDP=0-W-0-211-X,LROUTE=708,LAUTH=1;
 /* To Node 1-1-400 */

ADD-RICHT:MODE=LRTENEW,LRTE=710,LSVC=ALL,NAME=ISDN,
TGRP=84,DNNO=1-1-400;

ADD-RICHT:MODE=LRTENEW,LRTE=711,LSVC=ALL,NAME=ISDN,
TGRP=84,DNNO=1-1-400;

ADD-RICHT:MODE=LRTENEW,LRTE=712,LSVC=ALL,NAME=ISDN,
TGRP=84,DNNO=1-1-400;

ADD-LODR:ODR=16,CMD=OUTPULSE,DGTS=89;

ADD-LODR:ODR=16,CMD=ECHO,FIELD=3;

ADD-LODR:ODR=16,CMD=ECHO,FIELD=4;
```

```
ADD-LODR:ODR=16,CMD=NPI,NPI=ISDN;

ADD-LODR:ODR=16,CMD=TON,TON=SUBSCR;

ADD-LODR:ODR=16,CMD=END;

ADD-
LDAT:LROUTE=710,LSVC=ALL,LVAL=1,TGRP=84,ODR=10,LAUTH=1;

ADD-
LDAT:LROUTE=711,LSVC=ALL,LVAL=1,TGRP=84,ODR=11,LAUTH=1;

ADD-
LDAT:LROUTE=712,LSVC=ALL,LVAL=1,TGRP=84,ODR=16,LAUTH=1;

ADD-LDPLN:LDP=0-W-00-4989636-X,LROUTE=710,LAUTH=1;

ADD-LDPLN:LDP=0-W-0-89636-X,LROUTE=711,LAUTH=1;

ADD-LDPLN:LDP=0-W-636-X,LROUTE=712,LAUTH=1;

/* On the own node, LCR recognizes own node, TGRP
 ignored */
```

- The configuration for a route on the own node has changed due to the virtual node concept. As before, one route must be configured, but the recognition of a (logical) loop no longer takes place using the node number, but rather using a route attribute RERTEINT = Reroute Internal.

```
ADD-RICHT:MODE=LRTENEW,LRTE=706,LSVC=ALL,NAME=OWN,
TGRP=84,DNNO=1-1-100;

ADD-LODR:ODR=13,CMD=ECHO,FIELD=4;

ADD-LODR:ODR=13,CMD=END;

ADD-LDAT:LROUTE=706,LSVC=ALL,LVAL=1,TGRP=84,ODR=13,
LAUTH=1;

LATTR=RERTEINT

ADD-LDPLN:LDP=0-W-004989722-X,LROUTE=706,LAUTH=1; /*
International */

ADD-LDPLN:LDP=0-W-089722-X,LROUTE=706,LAUTH=1;
/* National */

ADD-LDPLN:LDP=0-W-722-X,LROUTE=706,LAUTH=1;
/* Subscriber */
```

- Set the tie line routes, outdial rules, route elements, and dial pattern plan in LCR for the PRIVATE numbering plan:

```
/* To Node 2-1-300 */

ADD-
RICHT:MODE=LRTENEW,LRTE=600,LSVC=ALL,NAME=ISDN,TGRP=74,
```

```
DNNO=2-0-0;

ADD-LODR:ODR=20,CMD=ECHO,FIELD=3;

ADD-LODR:ODR=20,CMD=ECHO,FIELD=4;

ADD-LODR:ODR=20,CMD=NPI,NPI=PRIVATE;

ADD-LODR:ODR=20,CMD=TON,TON=LEVEL2;

ADD-LODR:ODR=20,CMD=END;

ADD-LDAT:LROUTE=600,LSVC=ALL,LVAL=1,TGRP=74,ODR=20,
LAUTH=1;

ADD-LDPLN:LDP=15-11-31-X,LROUTE=600,LAUTH=1;
/* To Node 1-2-200 */

ADD-RICHT:MODE=LRTENEW,LRTE=607,LSVC=ALL,NAME=ISDN,
TGRP=75,

DNNO=1-2-0;

ADD-RICHT:MODE=LRTENEW,LRTE=608,LSVC=ALL,NAME=ISDN,
TGRP=75,

DNNO=1-2-0;

ADD-LODR:ODR=21,CMD=ECHO,FIELD=3;

ADD-LODR:ODR=21,CMD=ECHO,FIELD=4;

ADD-LODR:ODR=21,CMD=NPI,NPI=PRIVATE;

ADD-LODR:ODR=21,CMD=TON,TON=LEVEL1;

ADD-LODR:ODR=21,CMD=END;

ADD-LDAT:LROUTE=607,LSVC=ALL,LVAL=1,TGRP=75,ODR=20,
LAUTH=1;

ADD-LDAT:LROUTE=608,LSVC=ALL,LVAL=1,TGRP=75,ODR=21,
LAUTH=1;

ADD-LDPLN:LDP=15-11-391573-X,LROUTE=607,LAUTH=1;

ADD-LDPLN:LDP=15-1-1573-X,LROUTE=608,LAUTH=1;
 /* To Node 1-1-400 */

ADD-
RICHT:MODE=LRTENEW,LRTE=610,LSVC=ALL,NAME=ISDN,TGRP=84,
DNNO=1-1-400;

ADD-RICHT:MODE=LRTENEW,LRTE=611,LSVC=ALL,NAME=ISDN,
TGRP=84,DNNO=1-1-400;
```

```
ADD-RICHT:MODE=LRTENEW,LRTE=612,LSVC=ALL,NAME=ISDN,
TGRP=84,DNNO=1-1-400;

ADD-LODR:ODR=26,CMD=ECHO,FIELD=2;

ADD-LODR:ODR=26,CMD=ECHO,FIELD=3;

ADD-LODR:ODR=26,CMD=NPI,NPI=PRIVATE;

ADD-LODR:ODR=26,CMD=TON,TON=LOCAL;

ADD-LODR:ODR=26,CMD=END;

ADD-LDAT:LROUTE=610,LSVC=ALL,LVAL=1,TGRP=84,ODR=20,
LAUTH=1;

ADD-LDAT:LROUTE=611,LSVC=ALL,LVAL=1,TGRP=84,ODR=21,
LAUTH=1;

ADD-LDAT:LROUTE=612,LSVC=ALL,LVAL=1,TGRP=84,ODR=26,
LAUTH=1;

ADD-LDPLN:LDP=15-11-397195116-X,LROUTE=610,LAUTH=1;

ADD-LDPLN:LDP=15-1-7195116-X,LROUTE=611,LAUTH=1;

ADD-LDPLN:LDP=15-5116-X,LROUTE=612,LAUTH=1;
 /* On the own node, LCR recognizes own node, TGRP
 ignored */

ADD-
RICHT:MODE=LRTENEW,LRTE=606,LSVC=ALL,NAME=OWN,TGRP=84,

DNNO=1-1-100;

ADD-LODR:ODR=23,CMD=ECHO,FIELD=3;

ADD-LODR:ODR=23,CMD=END;

ADD-LDAT:LROUTE=606,LSVC=ALL,LVAL=1,TGRP=84,ODR=23,
LAUTH=1;

ADD-LDPLN:LDP=15-11397196051-X,LROUTE=606,LAUTH=1;

ADD-LDPLN:LDP=15-17196051-X,LROUTE=606,LAUTH=1;

ADD-LDPLN:LDP=15-6051-X,LROUTE=606,LAUTH=1;
```

- Set the tie line routes, outdial rules, route elements, and dial pattern plan in LCR for the UNKNOWN numbering plan:

```
/* To Node 2-1-300 */

ADD-RICHT:MODE=LRTENEW,LRTE=101,LSVC=ALL,NAME=UNKNOWN,
TGRP=74,DNNO=2-0-0;

ADD-LODR:ODR=6,CMD=ECHO,FIELD=1;
```

```
ADD-LODR:ODR=6,CMD=ECHO,FIELD=2;

ADD-LODR:ODR=6,CMD=END;

ADD-LDAT:LROUTE=101,LSVC=ALL,LVAL=1,TGRP=74,ODR=6;

ADD-LDPLN:LDP=39-X,LROUTE=101,LAUTH=1;
 /* To Node 1-2-200 */

ADD-RICHT:MODE=LRTENEW,LRTE=102,LSVC=ALL,NAME=UNKNOWN,
TGRP=75,DNNO=1-2-0;

ADD-LDAT:LROUTE=102,LSVC=ALL,LVAL=1,TGRP=75,ODR=6;

ADD-LDPLN:LDP=37-X,LROUTE=102,LAUTH=1;
 /* To Node 1-1-400 */

ADD-RICHT:MODE=LRTENEW,LRTE=103,LSVC=ALL,NAME=UNKNOWN,
TGRP=84,DNNO=1--1-400;

ADD-LDAT:LROUTE=103,LSVC=ALL,LVAL=1,TGRP=84,ODR=6;

ADD-LDPLN:LDP=27-X,LROUTE=103,LAUTH=1;
```

Configuration in other nodes

The configuration of the other nodes is performed in the same manner as that for Node 1-1-100. If (in exceptional cases) you do not want to configure the format-dependent modification for the ISDN and PRIVATE numbering plans, set the node connection matrix following Section .

5.21.2.2.2 Closed numbering of network in OpenScape 4000 specific numbering plan

In the following example, the subscribers on Level 0 in Munich should be closed-numbered in the OpenScape 4000 specific numbering plan. According to definition, ISDN and PRIVATE are always open-numbered. For this reason, the configuration for ISDN and PRIVATE remains unchanged for Section . Again, it should be based in the network topology shown in Figure 55. The numbers are shown in the following table:

Node	Number UNKNOWN	Number ISDN	Number PRIVATE
1-1-100	[30]-XXXX 30=area code	0-(00)49-(0)89-722-XXXX	15-(11)39-(1)719-6051-XXXX
1-1-400	[30]-XXXX 30=area code	0-(00)49-(0)89-636-XXXX	15-(11)39-(1)719-5116-XXXX
1-2-200	37-XXXX	0-(00)49-(0)211-734-XXXX	15-(11)39-(1)1573-634-XXXX
2-1-300	39-XXXX	0-(00)41-(0)1-636-XXXX	15-(11)31-(1)0-536-XXXX

Configuration in physical node 1-1-111

Here, only the differences in comparison with Section 41.2.2.1, "Three-level, open-numbered network/one-level OpenScape 4000 specific numbering plan" are listed.

- Set the node table:

```
ADD-
KNDEF:NNO=1-1-100,TYPE=OWN,ISDNCC=49,ISDNAC=89,ISDNLC=722,
ISDNSK=3,ISDNUL=EXT,PNPL2C=39,PNPL1C=719,PNPLC=6051,PNPSK=4,
PNPUL=EXT,NODECD=30,NODECDSK=2;

CHANGE-KNDEF:NNO=1-1-100,DFLT=Y;
```

- Set the own area code for UNKNOWN in WABE:
  `ADD-WABE:CD=30,DAR=OWNNODE;`
- Set the tie line code for Switzerland (NPI=UNKNOWN) in WABE:
  `ADD-WABE:CD=39,DAR=TIE;`
- Set the tie line for Dusseldorf (NPI=UNKNOWN) in WABE:
  `ADD-WABE:CD=37,DAR=TIE;`
- Set closed-numbered subscribers in WABE:

```
ADD-WABE:CD=001,DAR=NETRTE,CHECK=NO;

ADD-WABE:CD=2400&&2499,DAR=STN,DESTNO=4,CHECK=NO;
/* Subscriber in 1-1-400 */

ADD-WABE:CD=4000&&4799,DAR=STN,DESTNO=0,CHECK=NO;
/* Subscriber in own node */
```

  IMPORTANT: The number within an area must always be set fully qualified in AMO WABE (e.g. 43xxx is not valid!).

- The node connection matrix is to be set for the UNKNOWN numbering plan. You can see that the area code is treated like a normal node code in AMO KNMAT.

```
CHA-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=OWN,DNNOL=ROW,
MODCON=OUT,NUMEXT=#####;

CHA-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=ROW,DNNOL=OWN,
MODCON=IN&TRANSI,NUMRED=#####;
```

- Set the tie line routes, outdial rules, route elements, and dial pattern plan in LCR for the UNKNOWN numbering plan:

```
/* Open for Node 2-1-300 */

ADD-RICHT:MODE=LRTENEW,LRTE=101,LSVC=ALL,NAME=UNKNOWN,
TGRP=74,DNNO=2-0-0;

ADD-LODR:ODR=6,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=6,CMD=ECHO,FIELD=2;

ADD-LODR:ODR=6,CMD=END;

ADD-LDAT:LROUTE=101,LSVC=ALL,LVAL=1,TGRP=74,ODR=6;
```

```
ADD-LDPLN:LDP=39-X,LROUTE=101,LAUTH=1;
 /* Open for Node 1-2-200 */

ADD-RICHT:MODE=LRTENEW,LRTE=102,LSVC=ALL,NAME=UNKNOWN,
TGRP=75,DNNO=1-2-0;

ADD-LDAT:LROUTE=102,LSVC=ALL,LVAL=1,TGRP=74,ODR=6;

ADD-LDPLN:LDP=37-X,LROUTE=102,LAUTH=1;
 /* Closed for Node 1-1-400 */

ADD-RICHT:MODE=CD,LRTE=103,CD=001,CPS=0,SVC=ALL,
NAME=LCR_VERDECKT,TGRP1=84,DESTNO=4,DNNO=1-1-400;

ADD-LODR:ODR=7,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=7,CMD=END;

ADD-
LDAT:LROUTE=103,LSVC=ALL,LVAL=1,TGRP=84,ODR=7,LAUTH=1;
```

Configuration in other nodes

The setting of the other nodes can be derived from Node 1-1-111.

5.21.2.2.3 Open-numbered network, three-level, OpenScape 4000 specific numbering plan

This configuration is based on Figure 55. The UNKNOWN numbering plan (i.e. dialing with tie line codes) has three levels in this example, in contrast to Section . For ISDN and PRIVATE, as well, not the format-dependent, but the KNMAT modification should be configured.

IMPORTANT: This example should only be used to show the special cases of number modification.

In the following example, the network topology correspond with the example in Section . The UNKNOWN numbers, however, have one level there:

Node	Number UNKNOWN	Number ISDN	Number PRIVATE
1-1-100	29-36-19-XXXX	0-(00)49-(0)89-722-XXXX	15-(11)39-(1)719-6051-XXXX
1-1-400	29-36-27-XXXX	0-(00)49-(0)89-636-XXXX	15-(11)39-(1)719-5116-XXXX
1-2-200	29-26-37-XXXX	0-(00)49-(0)211-734-XXXX	15-(11)39-(1)1573-634-XXXX
2-1-300	18-37-39-XXXX	0-(00)41-(0)1-636-XXXX	15-(11)31-(1)0-536-XXXX

Configuration in physical node 1-1-111

Here, only the differences in comparison with Section 41.2.2.1, "Three-level, open-numbered network/one-level OpenScape 4000 specific numbering plan" are listed.

- Set the node table:

  Please observe that, in the case of a multi-level UNKNOWN numbering plan, only the lowest level is in AMO KNDEF. The reason for the different AMO KNDEF administration between explicit numbering plans (all levels must be described in AMO KNMAT) and the UNKNOWN numbering plan (only the lowest level must be described) is as follows: For explicit numbering plans, the codes for the modification are taken from AMO KNDEF, but from AMO KNMAT for UNKNOWN. The number of skip digits is taken from AMO KNDEF for both numbering plans. The skip digits, on the other hand, are on the lowest level of every numbering plan. If a called part number is analyzed, the number of the skip digits is thus determine in which the code is sought in AMO KNDEF at the lowest level and the respective skip digits are read.

  ```
  ADD-
  KNDEF:NNO=1-1-100,TYPE=OWN,ISDNCC=49,ISDNAC=89,ISDNLC=722,
  ISDNSK=3,ISDNUL=EXT,PNPL2C=39,PNPL1C=719,PNPLC=6051,PNPSK=4,
  PNPUL=EXT,NODECD=19,NODECDSK=2;

  CHANGE-KNDEF:NNO=1-1-100,DFLT=Y;
  ```

- Set the own node code for UNKNOWN in WABE:

  ```
  ADD-WABE:CD=19,DAR=OWNNODE; /* Level 0 node code
  (Hofmannstraße)*/

  ADD-WABE:CD=36,DAR=OWNNODE; /* Level 1 area code
   (Munich)*/

  ADD-WABE:CD=29,DAR=OWNNODE; /* Level 2 area code
   (Germany)*/
  ```

- Set the own physical node code in WABE:

  ```
  ADD-WABE:CD=919,DAR=OWNNODE; /* Level 0 node code
  (Hofmannstraße)*/
  ```

- Set tie line codes for UNKNOWN in WABE:

  ```
  ADD-WABE:CD=18,DAR=TIE; /* To 2-1-300 */

  ADD-WABE:CD=26,DAR=TIE; /* to 1-2-200 */

  ADD-WABE:CD=27,DAR=TIE; /* to 1-1-400 */
  ```

- Configure the node connection matrix for the UNKNOWN, ISDN, and PRIVATE numbering plans (three levels for UNKNOWN here as well).

  In the process, observe that the new logical specification of the digits to be supplemented/shortened is only possible at Level 0. On higher levels, the own code must still be determined by hand. You may of course determine the own code on Level 0 by hand as shown here.

  ```
  CHA-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=OWN,DNNOL=ROW,
  MODCON=OUT,NUMEXT=19,;
  ```

```
CHA-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=ROW,DNNOL=OWN,
MODCON=IN&TRANSI,NUMRED=19;

CHA-KNMAT:NPI=UNKNOWN,LEVEL=1,ONNOL=OWN,DNNOL=ROW,
MODCON=OUT,NUMEXT=36;

CHA-KNMAT:NPI=UNKNOWN,LEVEL=1,ONNOL=ROW,DNNOL=OWN,
MODCON=IN&TRANSI,NUMRED=36;

CHA-KNMAT:NPI=UNKNOWN,LEVEL=2,ONNOL=OWN,DNNOL=ROW,
MODCON=OUT,NUMEXT=29;

CHA-KNMAT:NPI=UNKNOWN,LEVEL=2,ONNOL=ROW,DNNOL=OWN,
MODCON=IN&TRANSI,NUMRED=29;

CHA-KNMAT:NPI=ISDN,LEVEL=0,ONNOL=OWN,DNNOL=ROW,
MODCON=OUT,NUMEXT=722,;

CHA-KNMAT:NPI=ISDN,LEVEL=0,ONNOL=ROW,DNNOL=OWN,
MODCON=IN&TRANSI,NUMRED=0722;

CHA-KNMAT:NPI=ISDN,LEVEL=1,ONNOL=OWN,DNNOL=ROW,
MODCON=OUT,NUMEXT=89;

CHA-KNMAT:NPI=ISDN,LEVEL=1,ONNOL=ROW,DNNOL=OWN,
MODCON=IN&TRANSI,NUMRED=0089;

CHA-KNMAT:NPI=ISDN,LEVEL=2,ONNOL=OWN,DNNOL=ROW,
MODCON=OUT,NUMEXT=49;

CHA-KNMAT:NPI=ISDN,LEVEL=2,ONNOL=ROW,DNNOL=OWN,
MODCON=IN&TRANSI,NUMRED=00049;

CHA-KNMAT:NPI=PRIVATE,LEVEL=0,ONNOL=OWN,DNNOL=ROW,
MODCON=OUT,NUMEXT=6051,;

CHA-KNMAT:NPI=PRIVATE,LEVEL=0,ONNOL=ROW,DNNOL=OWN,
MODCON=IN&TRANSI,NUMRED=156051;

CHA-KNMAT:NPI=PRIVATE,LEVEL=1,ONNOL=OWN,DNNOL=ROW,
MODCON=OUT,NUMEXT=719;

CHA-KNMAT:NPI=PRIVATE,LEVEL=1,ONNOL=ROW,DNNOL=OWN,
MODCON=IN&TRANSI,NUMRED=151719;

CHA-KNMAT:NPI=PRIVATE,LEVEL=2,ONNOL=OWN,DNNOL=ROW,
MODCON=OUT,NUMEXT=39;

CHA-KNMAT:NPI=PRIVATE,LEVEL=2,ONNOL=ROW,DNNOL=OWN,
MODCON=IN&TRANSI,NUMRED=151139;
```

- Set the tie line routes, outdial rules, route elements, and dial pattern plan in LCR for the UNKNOWN numbering plan:

```
/* To Node 2-1-300 */

ADD-RICHT:MODE=LRTENEW,LRTE=101,LSVC=ALL,NAME=UNKNOWN,
```

```
TGRP=74,DNNO=2--0-0;

ADD-LODR:ODR=6,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=6,CMD=ECHO,FIELD=2;

ADD-LODR:ODR=6,CMD=END;

ADD-LDAT:LROUTE=101,LSVC=ALL,LVAL=1,TGRP=74,ODR=6;

ADD-LDPLN:LDP=18-X,LROUTE=101,LAUTH=1;
 /* To Node 1-2-200 */

ADD-RICHT:MODE=LRTENEW,LRTE=102,LSVC=ALL,NAME=UNKNOWN,
TGRP=75,DNNO=1--2-0;

ADD-LODR:ODR=7,CMD=OUTPULSE,DGTS=29;

ADD-LODR:ODR=7,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=7,CMD=ECHO,FIELD=2;

ADD-LODR:ODR=7,CMD=END;

ADD-LDAT:LROUTE=102,LSVC=ALL,LVAL=1,TGRP=75,ODR=7;

ADD-LDPLN:LDP=26-X,LROUTE=102,LAUTH=1;
 /* To Node 1-1-400 */

ADD-RICHT:MODE=LRTENEW,LRTE=103,LSVC=ALL,NAME=UNKNOWN,
TGRP=84,DNNO=1--1-400;

ADD-LODR:ODR=8,CMD=OUTPULSE,DGTS=2936;

ADD-LODR:ODR=8,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=8,CMD=ECHO,FIELD=2;

ADD-LODR:ODR=8,CMD=END;

ADD-LDAT:LROUTE=103,LSVC=ALL,LVAL=1,TGRP=84,ODR=8;

ADD-LDPLN:LDP=27-X,LROUTE=103,LAUTH=1;
```

Configuration in other nodes

The setting of the other nodes can be derived from Node 1-1-111.

5.21.2.3 Open-numbered heterogeneous network

A heterogeneous network is a mixed network made of OpenScape 4000 nodes and nodes or subnets from earlier versions or nodes of other manufacturers.

5.21.2.3.1 Heterogeneous network with nodes that know only one node number

If you network a system which doesn't differentiate between virtual and physical NNO with OpenScape 4000, you can use the own node number of the older partner as both virtual and physical destination nodes for the configuration of the OpenScape 4000 switch.

5.21.2.3.2 Heterogeneous network with nodes that already modify

In this case, an OpenScape 4000/HiPath 4000 network (surrounded by a dotted line in Figure 56) is networked with nodes of the older versions Hicom 300 E V2.0 or Hicom 300 V3.4.

For all trunks leading to systems of the versions Hicom 300 V3.4, the COT parameter LINO (line with implicit numbers, see Section 41.1.2.2, "Explicit and implicit phone numbers") must be set. You must set the COT parameter LWNC (line without node number) for tie trunks TT1/2 only if the Hicom 300 V3.3/ Hicom 300 V3.4 network has already used the same node number (in a one-level network) or always in a multi-level network.

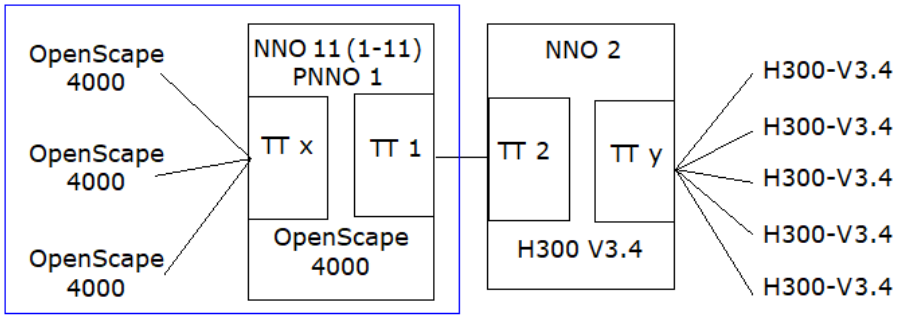


Figure 54: Example: Heterogeneous one-level or multi-level network with nodes that already modify

1) Multi-level OpenScape 4000 network or one-level network with ambiguous node numbers

a) Configuration in physical node PNNO=1 (or 1-1 for in case of two levels):

In OpenScape 4000 node PNNO=1 (1-1 for multi levels), define a COT:

```
ADD-COT:COTNO=12,PAR=LWNC&LINO&...;
```

Set up a route to Hicom 300 V3.4, e.g. in the multi-level network in this case. Node 2 must also be adapted to two levels in the same manner as Node 1-1, i.e. the fictive node number obtains a value of 2-0 (1-2 is also possible).

```
ADD-RICHT:MODE=LRTENEW,LRTE=101,LSVC=ALL,
NAME=UNKNOWN,TGRP=74,DNNO=2-0;
```

b) Configuration in physical node NNO=2:

In node NNO=2, you define a COT and a route. The fictive destination node 444 designates e.g. the "real" Node 1 in case, for example, Node 1 already exists in the Hicom 300 V3.4 subnet or, in case of multi levels, Node 1-1. Node number 444 may not exist in the Hicom 300 V3.4 subnet.

```
ADD-COT:COTNO=12,PAR=LWNC&...;
ADD-RICHT:MODE=LRTENEW,LRTE=233,LSVC=ALL,
NAME=UNKNOWN,TGRP=44,DNNO=444;
```

2) One-level network with unambiguous node numbers:

a) Configuration in physical node PNNO=1:

In OpenScape 4000 node NNO=11, you define a COT and a route:

```
ADD-COT:COTNO=12,PAR=LINO&...;

ADD-RICHT:MODE=LRTENEW,LRTE=101,LSVC=ALL,
NAME=UNKNOWN,TGRP=74,DNNO=2;
```

b) Configuration in physical node NNO=2:

In node NNO=2, no particular COT parameter is required. As usual, you set up a route to destination node 1 (via LCR here):

```
ADD-RICHT:MODE=LRTENEW,LRTE=233,LSVC=ALL,
NAME=UNKNOWN,TGRP=44,DNNO=1;
```

Setting the tie trunks:

The COT (class of trunk) number is to be set in TT1/2. You do not enter a fictive node number.

```
ADD-TDCSU:OPT=NEW,DEV=S2CONN,COTNO=12,...;
```

IMPORTANT: The COT parameter LWNC always functions in an outgoing direction. If the parameter is set, no node numbers are sent to the partner node. In this case, the source node number, however, can be reconstructed using the digit analysis. Reconstruction reduces the performance. For this reason, multi-level networks should be configured only if absolutely necessary.

5.21.2.3.3 Heterogeneous network with nodes that do not modify

In this case, an OpenScape 4000/HiPath 4000 network (surrounded by a dotted line in Figure 57) is networked with nodes of the older versions Hicom 300 V3.4 or systems of other manufacturers.

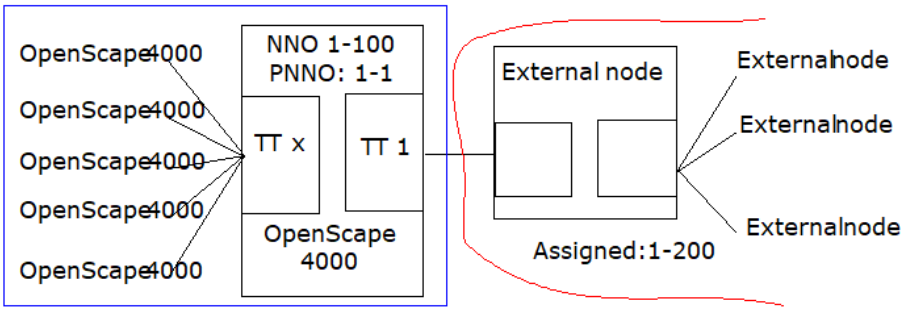


Figure 55: Example: Heterogeneous network with nodes that do not modify

The external network is assigned its own area or node number. In the example above, the external network is addressed from the OpenScape 4000 subnet with 1-200. Node number 1-200 is used for the configuration of the LCR routes and for number modification in AMO KNMAT.

Configuration of tie trunk TT1:

Define a COT with parameter LINO (line with implicit number) and LWNC (line without node number). The parameter DFNN (use preset node number in the

incoming direction) can be set if no reconstruction of the node numbers is desired using dial analysis. A single node number (that is set in AMO TDCSU, TACSU) is then assigned to the external network and the numbers can no longer be modified for each external node.

```
ADD-COT:COTNO=12,PAR=LINO&LWNC&DFNN&...;
```

Assign this COT to the tie trunk and set the fictive node number:

```
ADD-TDCSU:OPT=NEW,DEV=S2CONN,COTNO=12,
NNO=1-200,...;
```

Routes are also set up for this fictive destination node number:

```
ADD-RICHT:MODE=LRTENEW,LRTE=103,LSVC=ALL,
NAME=UNKNOWN,TGRP=84,DNNO=1-200;
```

Configuration of the node connection matrix:

If, for example, the external system reaches Code 77 from the viewpoint of the virtual node 1-100, set the following additional digits in Node 1-1:

```
CHANGE-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNO=200,DNNOL=OWN,
NUMEXT=77;
```

Code 77 is thus placed before the numbers coming from the external network at the entry node. In all other nodes, no modification is set for the external network.

5.21.2.3.4 Three-level, open-numbered network/one-level OpenScape 4000 specific numbering plan, overlapping virtual nodes

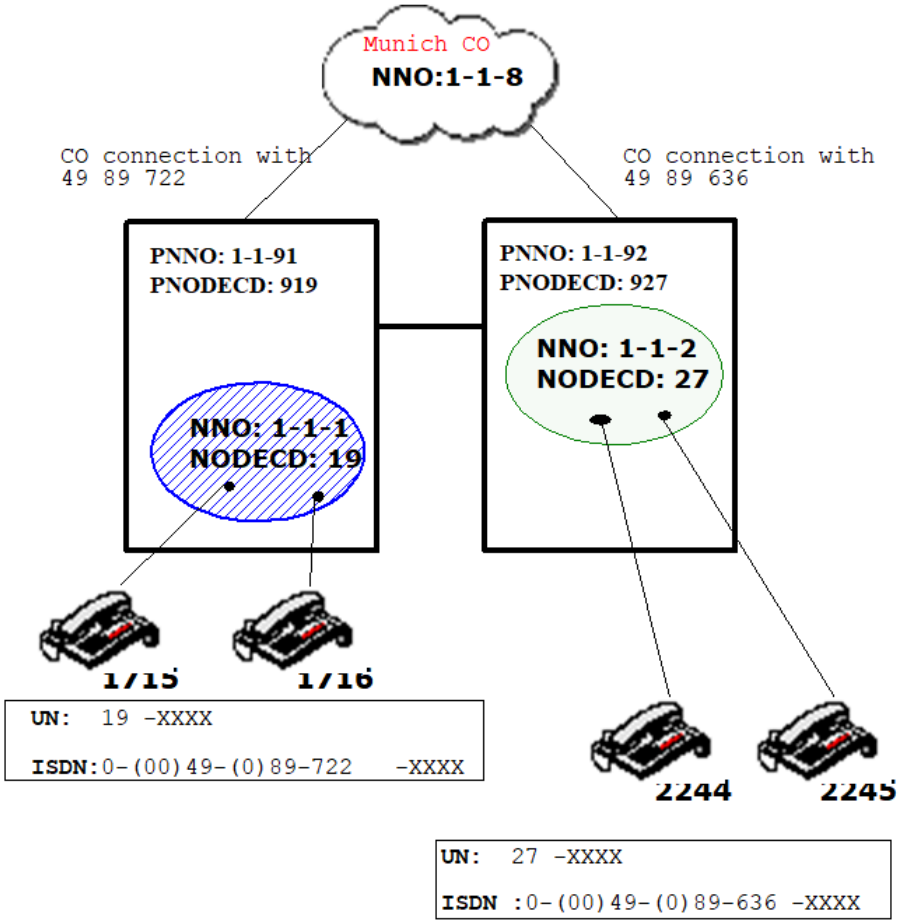


Figure 56: Before the move (non-overlapping virtual nodes)

What is new about this example is the feature of overlapping node. In Figure Figure 58, the initial state is shown. The normal configuration still exists with a 1:1 assignment from the physical to the virtual node.

In the next Figure 58, Subscriber 1716, which was originally configured in the system with PNNO 1-1-91, moved within the system with PNNO 1-1-92. The subscriber wanted to keep his or her fully qualified number (not just the extension). The same applies for Subscriber 2244, who was originally configured in 1-1-92 and then moved to 1-1-91.

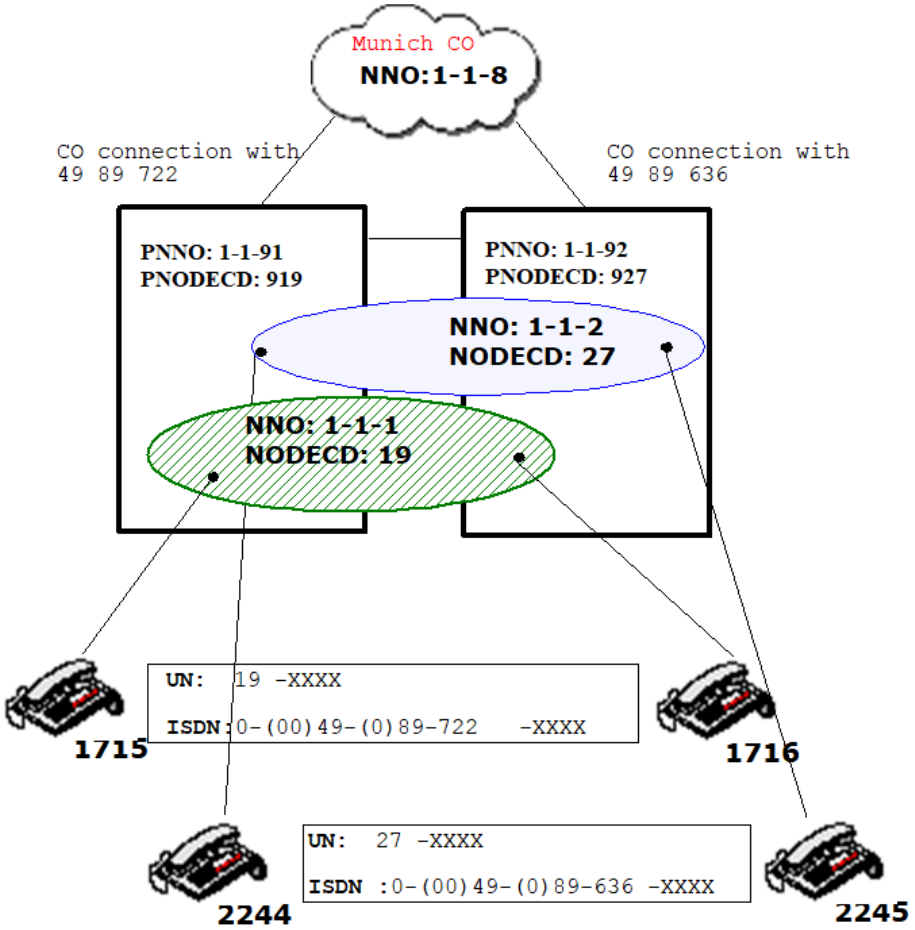


Figure 57: Overlapping Nodes

Abbreviations: UN = UNKNOWN, xxxx = station number (1 - 6 digits, 8 digits in special configurations). Prefixes are specified in parentheses.

In this example, the ISDN numbers are also three-level according to the rule following the three-level node numbers. In the OpenScape 4000 specific numbering plan with tie line codes, however, where the numbers should be as short as possible, numbering usually continues to be one-level (e.g. one-level node code).

In this example, physical nodes 1-1-91 and 1-1-92 form an overlapping area since there are overlapping virtual nodes between them. If the extensions in the overlapping area are unambiguous, a simplified configuration can be used that have performance advantages in comparison with the configuration shown in the next chapter. Such a (sub)net could also be closed-numbered and the configuration also works with a mixed format of closed and open numbering.

Configuration in physical node 1-1-91 before the move

Before the move, the following configuration was present:

Set the node table:

```
ADD-KNDEF:NNO=1-1-1,TYPE=OWN,ISDNCC=49,ISDNAC=89,
ISDNLC=722,ISDNSK=3,ISDNUL=EXT,NODECD=19,NODECDSK=2;
```

```
CHANGE-KNDEF:NNO=1-1-1,DFLT=Y;
```

All subsequently configured subscribers are assigned this virtual node by default (due to DFLT=Y). Here, however, is the command by means of which you can explicitly assign a subscriber a virtual NNO. Subscribers 1715 and 1716, however, are both still in the same virtual nodes:

```
CHANGE-SDAT:STNO=1715,TYPE=DATA1,NNO=1-1-1;

CHANGE-SDAT:STNO=1716,TYPE=DATA1,NNO=1-1-1;
```

Both subscribers are normally set up and configured in WABE.

Set the node prefix table for NPI=ISDN:

```
ADD-KNPRE:NPI=ISDN,TON=INTERNAT,EXIT=0,PREFIX=00;

ADD-KNPRE:NPI=ISDN,TON=NATIONAL,EXIT=0,PREFIX=0;

ADD-KNPRE:NPI=ISDN,TON=SUBSCR,EXIT=0;
```

Enter the own physical node number and code in the ZAND data:

```
CHANGE-ZAND:TYPE=ALLDATA,PNNO=1-1-91,PNODECD=919;
```

Set the own codes in WABE:

```
ADD-WABE:CD=919,DAR=OWNNODE;/*PNODECD*/

ADD-WABE:CD=19,DAR=OWNNODE;/*NODECD*/
```

Set CO exit codes in WABE:

```
ADD-WABE:CD=0,DAR=TIE;
```

Set tie line codes for UNKNOWN in WABE:

```
ADD-WABE:CD=27,DAR=TIE;
```

You can set up the trunk groups for direct CO connection, the trunk circuit, and the tie trunk as show in the previous examples.

You must set the node connection matrix only for the UNKNOWN numbering plan according to the rules in Section .

```
CHA-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=OWN,
DNNOL=ROW,NUMEXT=#####;

CHA-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=ROW,
DNNOL=OWN,NUMRED=#####;
```

The following setting results:

```
-------------------------------------------------------------------
NODE MATRIX FOR NPI = UNKNOWN, LEVEL = 0, OWN NNO = 1-1-100
-------------------------------------------------------------------
ONNO    |DNNO    |CONN|MODCON| NUMEXT                    |
 NUMRED
/ ONNOL|/ DNNOL|    |      |                           |
-------+-------+----+------+--------------------------
+-----------------------
```

```
  1    |ROW    | A  |ALL   | 19                        | -
------+------+----+------+-----------------------
+------------------------
ROW   | 1    | A    |ALL   | -                         | 19
```

Set the node format table for CO node 1-1-8, which expects the calling number in international format and the screening indicator NETWPROV (network provided, i.e. the number is checked by the network):

```
ADD-KNFOR:DNNO=1-1-8,NPI=ISDN,TONOUT=INTERNAT,
SCRE=NETWPROV;
```

Setting the CO route with LCR:

```
ADD-RICHT:MODE=LRTENEW,LRTE=20,LSVC=ALL,NAME="AMT_S2",
TGRP=71,DNNO=1-1-8;

ADD-LODR:ODR=20,CMD=ECHO,FIELD=3;

ADD-LODR:ODR=20,CMD=END;

ADD-LDAT:LROUTE=20,LSVC=ALL,LVAL=1,TGRP=71,ODR=20;

ADD-LDPLN:LDP=0-W-X,LROUTE=20,LAUTH=1;
```

Set the tie line routes, outdial rules, route elements, and dial pattern plan in LCR for the ISDN numbering plan. Here, only the AMOs and parameters important for this example are shown:

```
/* To remote Node 1-1-2 with three-level ISDN */

ADD-RICHT:MODE=LRTENEW,LRTE=203,...,DNNO=1-1-2;/* For
 dialing in
int. format */

ADD-RICHT:MODE=LRTENEW,LRTE=204,...,DNNO=1-1-2;/* For
 dialing in
nat. format */

ADD-RICHT:MODE=LRTENEW,LRTE=205,...,DNNO=1-1-2;/* For
 dialing in
sub. format*/
```

The outdial rule is to be formulated according to the desired format of the called party. In general, the international format is used in the ISDN numbering plan so that different outdial rules are required for the three dialing formats.

```
ADD-LODR:ODR=23,CMD=ECHO,FIELD=4;

ADD-LODR:ODR=23,CMD=ECHOALL;

ADD-LODR:ODR=23,NPI=ISDN,TON=INTERNAT;

ADD-LODR:ODR=23,CMD=END;

ADD-LODR:ODR=24,CMD=OUTPULSE,DGTS=49;

ADD-LODR:ODR=24,CMD=ECHO,FIELD=4;
```

```
ADD-LODR:ODR=24,CMD=ECHOALL;

ADD-LODR:ODR=24,NPI=ISDN,TON=INTERNAT;

ADD-LODR:ODR=24,CMD=END;

ADD-LODR:ODR=25,CMD=OUTPULSE,DGTS=4989;

ADD-LODR:ODR=25,CMD=ECHO,FIELD=3;

ADD-LODR:ODR=25,CMD=ECHOALL;

ADD-LODR:ODR=25,NPI=ISDN,TON=INTERNAT;

ADD-LODR:ODR=25,CMD=END;


 ADD-LDAT:LROUTE=203,.., ODR=23;

ADD-LDAT:LROUTE=204,.., ODR=24;

ADD-LDAT:LROUTE=205,.., ODR=25;


 ADD-LDPLN:LDP=0-W-00-4989636-X,LROUTE=203,LAUTH=1;
/* For dialing in international format*/

ADD-LDPLN:LDP=0-W-0-89636-X,LROUTE=204,LAUTH=1;
/* For dialing in nat. format*/

ADD-LDPLN:LDP=0-W-636-X,LROUTE=205,LAUTH=1;
/*For dialing in sub. format*/


/* To own node 1-1-1 with three-level ISDN */
```

Attention: As long as no subscriber has moved, these entries are optional! They make it possible for subscribers to reach other subscribers in their own node not just through their own extension, but also using an international, national, or subscriber number without using the public central office in the process.

```
ADD-RICHT:MODE=LRTENEW,LRTE=101,...,DNNO=1-1-1;
/* For dialing in ISDN format*/
```

With the RERTEINT attribute, you can mark a route element as a route element that leads to the own node from OpenScape 4000 and higher. No line is occupied (the trunk group specification is ignored), only the outdial rule is executed and the dial analysis is restarted. The outdial rule must be set up in such a way that only the extension is resent to the dial analysis.

```
ADD-LODR:ODR=26,CMD=ECHO,FIELD=5;

ADD-LODR:ODR=26,CMD=END;

ADD-LDAT:LROUTE=101,.., ODR=26,LATTR=RERTEINT;

ADD-LDPLN:LDP=0-W-00-4989722-X,LROUTE=101,LAUTH=1;
```

```
ADD-LDPLN:LDP=0-W-0-89722-X,LROUTE=101,LAUTH=1;

ADD-LDPLN:LDP=0-W-7-22-X,LROUTE=101,LAUTH=1;
```

Set the tie line routes, outdial rules, route elements, and dial pattern plan in LCR for the UNKNOWN numbering plan:

```
/* To remote Node 1-1-2 with one-level UNKNOWN */

ADD-RICHT:MODE=LRTENEW,LRTE=206,LSVC=ALL,NAME="UNKNOWN
 1-1-2",
TGRP=74,DNNO=1-1-2;

ADD-LODR:ODR=22,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=22,CMD=ECHO,FIELD=2;

ADD-LODR:ODR=22,CMD=END;

ADD-LDAT:LROUTE=206,LSVC=ALL,LVAL=1,TGRP=74,ODR=22;

ADD-LDPLN:LDP=27-X,LROUTE=206,LAUTH=1;
```

Configuration in physical node 1-1-92 before the move

Set the node table:

```
ADD-
KNDEF:NNO=1-1-2,TYPE=OWN,ISDNCC=49,ISDNAC=89,ISDNLC=636,
ISDNSK=3,ISDNUL=EXT,NODECD=27,NODECDSK=2;

CHANGE-KNDEF:NNO=1-1-2,DFLT=Y;
```

All subsequently configured subscribers are assigned this virtual node by default (due to DFLT=Y). Here, however, is the command by means of which you can explicitly assign a subscriber a virtual NNO. Subscribers 2244 and 2245, however, are both still in the same virtual nodes:

```
CHANGE-SDAT:STNO=2244,TYPE=DATA1,NNO=1-1-2;

CHANGE-SDAT:STNO=2245,TYPE=DATA1,NNO=1-1-2;
```

Set the node prefix table:

```
ADD-KNPRE:NPI=ISDN,TON=INTERNAT,EXIT=0,PREFIX=00;

ADD-KNPRE:NPI=ISDN,TON=NATIONAL,EXIT=0,PREFIX=0;

ADD-KNPRE:NPI=ISDN,TON=SUBSCR,EXIT=0;
```

Enter the own physical node number and code in the ZAND data:

```
AE-ZAND:TYPE=ALLDATA,PNNO=1-1-92,PNODECD=927;
```

Set the own codes in WABE:

```
ADD-WABE:CD=927,DAR=OWNNODE;/*PNODECD*/

ADD-WABE:CD=27,DAR=OWNNODE; /*NODECD*/
```

Set CO exit codes in WABE:

```
ADD-WABE:CD=0,DAR=TIE;
```

Set tie line codes for UNKNOWN in WABE:

```
ADD-WABE:CD=19,DAR=TIE;
```

You can set up the trunk groups for direct CO connection, the trunk circuit, and the tie trunk as show in the previous examples.

You must set the node connection matrix only for the UNKNOWN numbering plan according to the rules in Section 41.2.1.5, "Source/destination-dependent number modification in the ISDN or PNP numbering plan".

```
CHA-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=OWN,DNNOL=ROW,
NUMEXT=#####;

CHA-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=ROW,DNNOL=OWN,
NUMRED=#####;
```

The following setting results:

```
-------------------------------------------------------------------
NODE MATRIX FOR NPI = UNKNOWN, LEVEL = 0, OWN NNO = 1-1-100
-------------------------------------------------------------------
ONNO    |DNNO    |CONN|MODCON| NUMEXT                    |
 NUMRED
/ ONNOL|/ DNNOL|    |      |                           |
-------+-------+----+------+---------------------------
+------------------------
  1     |ROW     | A  |ALL   | 27                        | -
-------+-------+----+------+---------------------------
+------------------------
ROW     | 1      | A  |ALL   | -                         | 27
```

Set the node format table for CO node 1-1-8, which expects the calling number in international format and the screening indicator NETWPROV (network provided, d.h. the number is checked by the network):

```
ADD-KNFOR:DNNO=1-1-8,NPI=ISDN,TONOUT=INTERNAT,
SCRE=NETWPROV;
```

Setting the CO route with LCR:

```
ADD-RICHT:MODE=LRTENEW,LRTE=20,LSVC=ALL,NAME="AMT_S2",
TGRP=71,DNNO=1-1-8;

ADD-LDPLN:LDP=0-W-X,LROUTE=20,LAUTH=1;
```

Set the tie line routes, outdial rules, route elements, and dial pattern plan in LCR for the ISDN numbering plan. Here, only the AMOs and parameters important for this example are shown:

```
/* To remote Node 1-1-1 with three-level ISDN */

ADD-RICHT:MODE=LRTENEW,LRTE=103,...,DNNO=1-1-1;
/*für Wahl im int. Format*/

ADD-RICHT:MODE=LRTENEW,LRTE=104,...,DNNO=1-1-1;
/* For dialing in nat. format*/
```

```
ADD-RICHT:MODE=LRTENEW,LRTE=105,...,DNNO=1-1-1;
/*For dialing in sub. format*/

ADD-LODR:ODR=23,CMD=ECHO,FIELD=4;

ADD-LODR:ODR=23,CMD=ECHOALL;

ADD-LODR:ODR=23,NPI=ISDN,TON=INTERNAT;

ADD-LODR:ODR=23,CMD=END;

ADD-LODR:ODR=24,CMD=OUTPULSE,DGTS=49;

ADD-LODR:ODR=24,CMD=ECHO,FIELD=4;

ADD-LODR:ODR=24,CMD=ECHOALL;

ADD-LODR:ODR=24,NPI=ISDN,TON=INTERNAT;

ADD-LODR:ODR=24,CMD=END;

ADD-LODR:ODR=25,CMD=OUTPULSE,DGTS=4989;

ADD-LODR:ODR=25,CMD=ECHO,FIELD=3;

ADD-LODR:ODR=25,CMD=ECHOALL;

ADD-LODR:ODR=25,NPI=ISDN,TON=INTERNAT;

ADD-LODR:ODR=25,CMD=END;

ADD-LDAT:LROUTE=103,.., ODR=23;

ADD-LDAT:LROUTE=104,.., ODR=24;

ADD-LDAT:LROUTE=105,.., ODR=25;

ADD-LDPLN:LDP=0-W-00-4989722-X,LROUTE=103,LAUTH=1;
/* For dialing in int. format*/

ADD-LDPLN:LDP=0-W-0-89722-X,LROUTE=104,LAUTH=1;
/* For dialing in nat. format*/

ADD-LDPLN:LDP=0-W-722-X,LROUTE=105,LAUTH=1;
/*For dialing in sub. format*/

/* To own Node 1-1-2 with three-level ISDN */
```

Attention: As long as no subscriber has moved, these entries are optional!

You thus make it possible for subscribers to reach other subscribers in their own node not just through their own extension, but also using an international, national, or subscriber number without using the public central office in the process.

```
ADD-RICHT:MODE=LRTENEW,LRTE=201,...NAME="REROUTE 1-1-1",
DNNO=1-1-2;
```

With the RERTEINT attribute, you can mark a route element as a route element that leads to the own node from OpenScape 4000 and higher. No line is occupied (the trunk group specification is ignored), only the outdial rule is executed and the dial analysis is restarted:

```
ADD-LODR:ODR=26,CMD=ECHO,FIELD=5;

ADD-LODR:ODR=26,CMD=END;

ADD-LDAT:LROUTE=201,.., ODR=26,LATTR=RERTEINT;

ADD-LDPLN:LDP=0-W-00-4989636-X,LROUTE=201,LAUTH=1;

ADD-LDPLN:LDP=0-W-0-89636-X,LROUTE=201,LAUTH=1;

ADD-LDPLN:LDP=0-W-6-36-X,LROUTE=201,LAUTH=1;
```

Set the tie line routes, outdial rules, route elements, and dial pattern plan in LCR for the UNKNOWN numbering plan:

```
/* To remote Node 1-1-1 with one-level UNKNOWN */
ADD-RICHT:MODE=LRTENEW,LRTE=106,LSVC=ALL,NAME=UNKNOWN,
TGRP=74,DNNO=1-1-1,PDNNO=1-1-92;

ADD-LODR:ODR=22,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=22,CMD=ECHO,FIELD=2;

ADD-LODR:ODR=22,CMD=END;

ADD-LDAT:LROUTE=106,LSVC=ALL,LVAL=1,TGRP=74,ODR=22;

ADD-LDPLN:LDP=19-X,LROUTE=106,LAUTH=1;
```

Changes in the Configuration after the Move

For the move from 1716 to physical node 1-1-92, you must make the following changes:

- In physical node 1-1-91:

  The WABE entry for 1716 as a subscriber in the own system must be changed on the external system after the subscriber configuration was deleted. The setup takes place using destination numbers as in the case of closed numbering.

  Routes that have a destination node number of 1-1-1 must be redefined, whereby the newly arising node portion on physical node 1-1-92 is meant. These routes must be assigned to route elements that occupy the tie line route.

  – If you would like to give internal subscribers the choice of ISDN numbers in international, national, or subscriber format, the existing dial plan must be expanded for the own ISDN codes. Subscriber 1716 should be removed from the reroute internal configuration and a subscriber-specific entry that leads to the partner node should be made for 1716. Without this entry, a reroute internal run with renewed dial analysis would also lead to this result, but this loop can be prevented and thus a higher performance can be achieved.

```
ADD-
RICHT:MODE=LRTENEW,LRTE=103,...,DNNO=1-1-1;PDNNO=1-1-92;


ADD-LDAT:LROUTE=103,LSVC=ALL,LVAL=1,TGRP=74,ODR=26;

ADD-LDPLN:LDP=0-W-00-4989722-1716,LROUTE=103,LAUTH=1;

ADD-LDPLN:LDP=0-W-0-89722-1716,LROUTE=103,LAUTH=1;

ADD-LDPLN:LDP=0-W-722-1716,LROUTE=103,LAUTH=1;
```

The specification of the fields of the dial pattern is oriented on the requirements of the outdial rule and thus on the desired format of the called party. In the following, a closed numbering is set up in the physical node 1-1-91 for the stations that moved (all subscribers within the virtual node 1-1-1 can thus reach each other by dialing the number).

```
ADD-RICHT:MODE=CD,LRTE=207,CD=0101,SVC=ALL, NAME="NODE
 1-1-1",
DESTNO=1,DNNO=1-1-1,PDNNO=1-1-92;

ADD-LODR:ODR=10,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=10,CMD=END;

ADD-LDAT:LROUTE=207,LSVC=ALL,LVAL=1,TGRP=74,ODR=10;

CHANGE-WABE:CD=1716,DESTNO=1;
```

- In physical node 1-1-92:
  - The virtual node 1-1-1 extends to this physical node and must be made known. The same configuration of NNO 1-1-1 as in physical node 1-1-91 is to be used. This node is added to 1-1-2, but remains 1-1-2.

    ```
    ADD-KNDEF:NNO=1-1-1,TYPE=OWN,
     ISDNCC=49,ISDNAC=89,ISDNLC=722,
    ISDNSK=3,ISDNUL=EXT, NODECD=19,NODECDSK=2;
    ```
  - Subscriber 1716 must be set up with a subscriber AMO as usual, but the node to which he or she belongs must then be changed so that the modification can be properly performed for this subscriber:
    `CHANGE-SDAT:STNO=1716,TYPE=DATA1,NNO=1-1-1;`
  - If Subscriber 1716 should also be reached with his or her ISDN number in international, national, or subscriber format without a CO connection being established, reroute internal should be used:

    ```
    ADD-LDAT:LROUTE=101,.., ODR=26,LATTR=RERTEINT;
    /* already set up */

    ADD-LDPLN:LDP=0-W-00-4989722-1716,LROUTE=101,LAUTH=1;

    ADD-LDPLN:LDP=0-W-0-89722-1716,LROUTE=101,LAUTH=1;

    ADD-LDPLN:LDP=0-W-7-22-1716,LROUTE=101,LAUTH=1;
    ```
  - The same applies to the one-level OpenScape 4000 numbering plan:

```
ADD-RICHT:MODE=LRTENEW,LRTE=102,LSVC=ALL,NAME="REROUTE
 1-1-1",
TGRP=74, DNNO=1-1-1,PDNNO=1-1-92;

ADD-LODR:ODR=10,CMD=ECHO,FIELD=2;

ADD-LODR:ODR=10,CMD=END;

ADD-LDAT:LROUTE=102,LSVC=ALL,LVAL=1,TGRP=74,
ODR=10,LATTR=RERTEINT;

ADD-LDPLN:LDP=19-1716,LROUTE=102,LAUTH=1;
```

Adapting the outdial rule for the existing digit pattern 19-X:

```
CHANGE-LDAT:LROUTE=106,LSVC=ALL,LRTEL=1,ODR=10;
```

You can configure the move of Subscriber 2244 to the other system analogously.

You must now set the node connection matrix for the UNKNOWN numbering plan again according to the rules in Section 41.2.1.5, "Source/destination-dependent number modification in the ISDN or PNP numbering plan" as follows:

```
CHA-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=OWN,DNNOL=ROW,
NUMEXT=#####;

CHA-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=ROW,DNNOL=OWN,
NUMRED=#####;
```

IMPORTANT: The moved subscriber now uses the LCR and, usually, the CO route located in the new system. (For the carrier/central office, it is possible to request the ""No Screening Options" feature to specify the appropriate "calling party number" in the outgoing direction as well.)

5.21.2.3.5 Three-level, open-numbered network/one-level OpenScape 4000 specific numbering plan, overlapping virtual nodes with ambiguous extensions

This example should show that a network with overlapping nodes can also only be configured with open numbering. This has the advantage that the extensions do not have to be unique3 throughout the network.

IMPORTANT: **Rule**: Extensions, however, have to be unique for each physical node and each virtual node!

- The following configuration is thus valid (with Station: 4711):

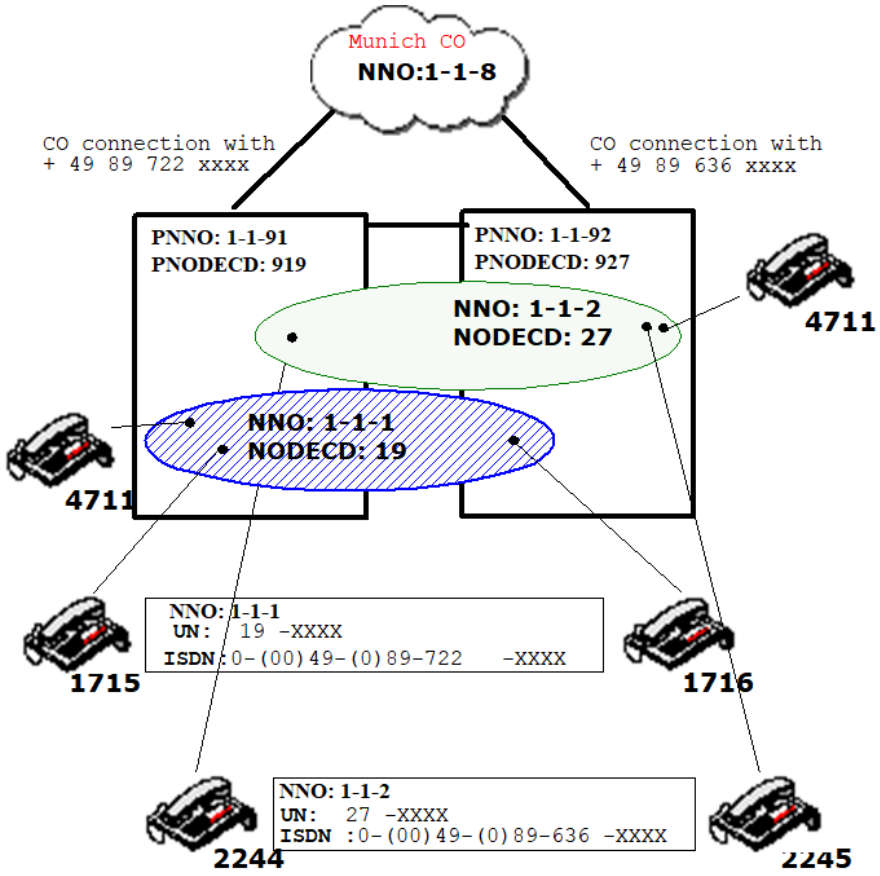


Figure 58: Non-unique extensions in the network

- The configuration of 4711 to VNNO 1-1-2 and PNNO: 1-1-91 or of 4711 to VNNO 1-1-1 and PNNO 1-1-92, on the other hand, is not valid.

Both subscribers 4711 (in NNO 1-1-1 and PNNO 1-1-91 and in NNO 1-1-2 and PNNO 1-1-92) are permissible, but not unique throughout the network! Uniqueness is achieved only with their ISDN L0 codes. This leads us to the concept of the lowest unique level. The lowest unique level of the ISDN number is the subscriber level. This effects calls from other networks, for example. Let's assume that there is a further network, e.g. with nodes in other areas, only via Node 1-1-91 (1-1-92 can only be reached as a transit node via 1-1-91). The called party may not be shortened below the lowest unique level. The called party 49 89 636 4711 would otherwise be incorrectly identified, namely as a subscriber of the transit node.

The configuration is based on the basic principle that the digit analysis can provide no general statement as to whether a number that consists of more than one extension refers to an internal or external destination. For this reason, the first digit analysis procedure always refers to TIE to evaluate the dial plan. TIE can analyze the entire number and process the number and transfer a second digit analysis procedure in case of the recognition of an internal destination or determine an external destination. Losses in performance, however, occur due to this loop.

Configuration in physical node 1-1-91

Due to non-unique extensions, a change must be made in AMO KNDEF. The ISDN unique level must be raised from the station to the subscriber. From the point of view of the software, you thus prevent the called party from being shortened in the device handler under the subscriber level. At the same time, however, you must then set up the dial plan in such a way that called parties can be analyzed in subscriber format.

```
ADD-KNDEF:NNO=1-1-1,TYPE=OWN,ISDNCC=49,ISDNAC=89,
ISDNLC=722,ISDNSK=3,ISDNUL=EXT,NODECD=19,NODECDSK=2;

CHANGE-KNDEF:NNO=1-1-1,DFLT=Y;

ADD-KNDEF:NNO=1-1-2,TYPE=OWN,ISDNCC=49,ISDNAC=89,
ISDNLC=636,ISDNSK=3,ISDNUL=EXT,NODECD=27,NODECDSK=2;
```

The subscribers are assigned to the virtual node, whereby only the ones that are not in the default node must be explicitly configured.

```
CHANGE-SDAT:STNO=1715,TYPE=DATA1,NNO=1-1-1;

CHANGE-SDAT:STNO=2244,TYPE=DATA1,NNO=1-1-2;
/* Expl. conf. reqd.*/

CHANGE-SDAT:STNO=4711,TYPE=DATA1,NNO=1-1-1;
```

The subscribers are usually set up as a subscriber in WABE .

As usual, set the node prefix table using AMO KNPRE, and enter the own physical node number and code in the ZAND data and the own physical code in AMO WABE Enter DAR=OWNNODE.

Virtual codes 19 and 27 may not be entered as OWNNODE, but rather as TIE so that the dial plan analysis can be transferred. The reason for this is the same as for the determination of the lowest unique level for ISDN numbers: OWNNODE is used to shorten the called party. Since 4711 is only unambiguous due to his or her tie line code, however, it may not fit in a transit node. Of the entire called party, the dial plan can recognize whether a certain call is internal or external.

```
ADD-WABE:CD=19,DAR=TIE;/*NODECD*/

ADD-WABE:CD=27,DAR=TIE;/*NODECD*/
```

Set CO exit codes in WABE:
`ADD-WABE:CD=0,DAR=TIE;`

You can set up the trunk groups for direct CO connection, the trunk circuit, and the tie trunk as show in the previous examples.

Set up tie routes, outdial rules, and route elements for the ISDN numbering plan in the normal manner. Routes are required for each virtual destination node, however, as shown above. The dial plan is shown here. The specified entries are absolutely necessary. Entries for a selection of the internal or external subscribers in national or international format may continue to be necessary.

```
ADD-LDPLN:LDP=0-722-X,LROUTE=route to own node 1-1-1;
```

This route aims at the own "normal" subscriber of the default node. It may receive only one route element for which the RERTEINT attribute is set. The outdial rule may contain only the extension.

```
ADD-LDPLN:LDP=0-722-1716,LROUTE=route to partner node
 1-1-1;
```

These routes really lead to the outside and aim at the "exception subscriber," Subscriber 1716 who moved.

```
ADD-LDPLN:LDP=0-636-X,LROUTE=route to partner node 1-1-2
```

These routes are the configuration for the "normal" subscriber on the partner node and really lead to the outside.

```
ADD-LDPLN:LDP=0-636-2244,LROUTE=route to own node 1-1-2
```

This route only applies for the "exception subscriber" 2244, who has moved here. The route may receive only one route element for which the RERTEINT attribute is set. The outdial rule may contain only the extension.

Set the tie route, outdial rules, route elements for the UNKNOWN numbering plan as usual. Routes are required for each destination node, however, as shown above. The dial plan is shown here. The specified entries are absolutely required. Entries for a selection of the internal or external subscribers in national or international format may continue to be necessary.

```
ADD-LDPLN:LDP=19-X,LROUTE=route to own node 1-1-1;
```

This route aims at the own "normal" subscriber of the default node. It may receive only one route element for which the RERTEINT attribute is set. The outdial rule may contain only the extension.

```
ADD-LDPLN:LDP=19-1716,LROUTE=route to partner node 1-1-1;
```

These routes really lead to the outside and aim at the "exception subscriber," Subscriber 1716 who moved.

```
ADD-LDPLN:LDP=27-X,LROUTE=route to partner node 1-1-2
```

These routes are configuration for the "normal" subscriber on the partner node and really lead to the outside.

```
ADD-LDPLN:LDP=27-2244,LROUTE=route to own node 1-1-2
```

This route only applies for the "exception subscriber" 2244, who has moved here. The route may receive only one route element for which the RERTEINT attribute is set. The outdial rule may contain only the extension.

You must set the node connection matrix only for the UNKNOWN numbering plan according to the rules in Section 41.2.1.5, "Source/destination-dependent number modification in the ISDN or PNP numbering plan". The use of ##### for the specification of the digits to be supplemented or abbreviated in combination with the logical NNO OWN extracts all virtual nodes and their codes from AMO KNDEF:

```
CHA-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=OWN,DNNOL=ROW,
NUMEXT=#####;

CHA-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=ROW,DNNOL=OWN,
NUMRED=#####;
```

The following setting results:

```
------------------------------------------------------------
NODE MATRIX FOR NPI = UNKNOWN, LEVEL = 0
```

```
-------------------------------------------------------------------
ONNO    |DNNO    |CONN|MODCON| NUMEXT                    |
 NUMRED
/ ONNOL|/ DNNOL|    |      |                           |
-------+-------+----+------+-------------------------
+-----------
  1     |ROW     | A  |ALL   | 19                        | -
  2     |ROW     | A  |ALL   | 27                        | -
-------+-------+----+------+-------------------------
+-----------
  ROW   | 1      | A  |ALL   | -                         | 19
  ROW   | 2      | A  |ALL   | -                         | 27
```

Configuration in physical node 1-1-92

Analogously to 1-1-92

5.21.2.3.6 US EPNP network with overlapping L0 codes for extension, without exit or prefixes

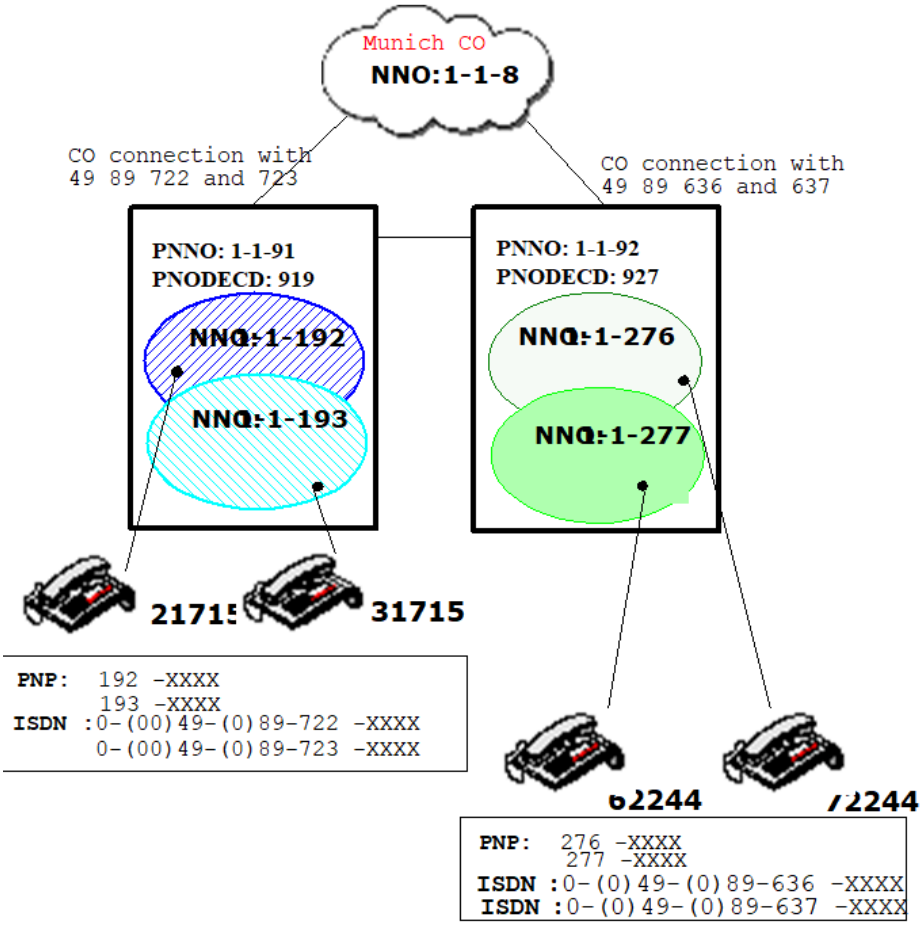


Figure 59: US EPNP with overlapping L0 code/extension

Here, a one-level PNP is used for internal network, as usual in the U.S. networks. No exit or prefixes are used for PNP. It looks like a OpenScape 4000 numbering plan and the configuration is a mixed form of open numbering and

PNP. Signaling takes place in PNP and both the called party and information numbers should be transferred in LOCAL format.

In addition, the overlapping feature is shown between extensions and L0 code. For PNNO 1-1-91, the customer has purchased two CO numbers with extension 0 to 9999, 722 and 723. To cover the customer's extension requirements of about 19,000, the customer has created an extension range of 20000 to 29999 and 30000 to 39999 through the overlapping of the last digit. The overlapping must thus also be transferred to the PNP.

Configuration in physical node 1-1-91

```
ADD-KNDEF:NNO=1-1-192,TYPE=OWN,

ISDNCC=49,ISDNAC=89,ISDNLC=722,ISDNSK=2,ISDNUL=EXT,

PNPLC=192,PNPSK=2,PNPUL=EXT;

CHANGE-KNDEF:NNO=1-1-192,DFLT=Y;
 ADD-KNDEF:NNO=1-1-193,TYPE=OWN,

ISDNCC=49,ISDNAC=89,ISDNLC=723,ISDNSK=2,ISDNUL=EXT,

PNPLC=193,PNPSK=2,PNPUL=EXT;
```

The subscribers are assigned to the virtual node, whereby only the ones that are not in the default node must be explicitly configured.

```
CHANGE-SDAT:STNO=21715,TYPE=DATA1,NNO=1-1-192;

CHANGE-SDAT:STNO=31715,TYPE=DATA1,NNO=1-1-193;
```

The subscribers are normally set up as subscribers in WABE, whereby the overlapping digit belongs to the extension, i.e. 21716 and 31715.

Set the node prefix table:

```
ADD-KNPRE:NPI=ISDN,TON=INTERNAT,EXIT=0,PREFIX=00;

ADD-KNPRE:NPI=ISDN,TON=NATIONAL,EXIT=0,PREFIX=0;

ADD-KNPRE:NPI=ISDN,TON=SUBSCR,EXIT=0;
```

For PNP, no entry may be made since no exit or prefixes are used for processing.

You can set the format of the outgoing information number in KNFOR.

```
ADD-KNFOR:DNNO=1-1-276,NPI=PRIVATE,TONOUT=LOCAL;

ADD-KNFOR:DNNO=1-1-277,NPI=PRIVATE,TONOUT=LOCAL;
```

If information numbers should also be displayed with L0 code in the own node, use this command: This only effects the number transferred in the network, however, not for internal calls:

```
ADD-KNFOR:DNNO=1-1-192,NPI=ISDN,TONIN= LOCAL;

ADD-KNFOR:DNNO=1-1-193,NPI=ISDN,TONIN= LOCAL;
```

In the digit analysis, forward the local code of the partner to the TIE digit analysis result. Normally, the PNP exit is referred to TIE here, but since there is

no exit, the local code is configured like a tie line code of the OpenScape 4000 UNKNOWN numbering plan.

```
ADD-WABE:CD=276,DAR=TIE;

ADD-WABE:CD=277,DAR=TIE;
```

When needed, you can set up the own local codes as OWNNODE. In contrast to open numbering, this entry is not required in the UNKNOWN station for incoming calls through the network since the called party is shortened via the AMO KNDEF table in case of network-wide calls. They cannot enable dialing with codes for subscribers, however, which is recommended for a constellation with two virtual nodes. Subscriber 21715 can thus reach Subscriber 31715 by dialing 31715 or 1931715. The skip digits are not specified in WABE; they are automatically determined from the entries in the AMO KNDEF table.

```
ADD-WABE:CD=192,DAR=OWNNODE;

ADD-WABE:CD=193,DAR=OWNNODE;
 ADD-LDPLN:LDP=276-X,LROUTE=1408,...;

ADD-LDPLN:LDP=277-X,LROUTE=1308,...;
```

For the transfer of the called party (and thus the information numbers) in PNP, you need a relevant outdial rule.

```
ADD-LODR:ODR=60,CMD=NPI,NPI=PRIVATE,TON=LOCAL;
 ADD-LODR:ODR=60,CMD=ECHO,FIELD=1;
 ADD-LODR:ODR=60,CMD=ECHOALL;
 ADD-LODR:ODR=60,CMD=END;
```

Define routes with the virtual node of the partner as the target node and assign the outdial rule.

```
ADD-RICHT:MODE=LRTENEW,LRTE=1408,...,DNNO=1-1-276;

ADD-RICHT:MODE=LRTENEW,LRTE=1308,...,DNNO=1-1-277;


 ADD-LDAT:LROUTE=1408,.., ODR=60;

ADD-LDAT:LROUTE=1308,.., ODR=60;
```

Comment: If you do not want to transfer the called party in local format, but rather as an extension in subsystem and if you also want to use the overlapping of the local code for an extension, observe the following: The outdial rule must divide the dial pattern into fields in such a way that the specification of a field for the extension is possible in the outdial rule. For this purpose, the check in AMO LDPLN was changed so that a splitting of the local code into skip digits and overlapping portion is now possible as well.

```
ADD-LDPLN:LDP=27-X,LROUTE=1408,...;

 /* The 6 of local code 276 is a part of Field 2 */
```

The corresponding outdial rule would be:

```
ADD-LODR:ODR=60,CMD=NPI,NPI=PRIVATE,TON=UNKNOWN;
 ADD-LODR:ODR=60,CMD=ECHO,FIELD=2;
 ADD-LODR:ODR=60,CMD=ECHOALL;
 ADD-LODR:ODR=60,CMD=END;
```

The number modification takes place with data from AMO KNDEF.

Service information

- No settings for KNMAT are required.
- In this example, the overlapping digits between NPI ISDN and PRIVATE must be identical.
- The digit pattern for the connection between the systems in PNP must possible be set up individually for the overlapping digits.

Configuration in physical node 1-1-92

The physical node 1-1-92 is configured analogously to 1-1-91.

5.21.2.3.7 US EPNP network with overlapping L0 codes for extension, with exit, without prefixes

It is also possible to configure PNP without prefixes, but with exit. For this purpose, an entry must be made in KNPRE:

```
ADD-KNPRE:NPI=PRIVATE,TON=LOCAL,EXIT=9;

ADD-KNPRE:NPI=PRIVATE,TON=LEVEL1,EXIT=9;

ADD-KNPRE:NPI=PRIVATE,TON=LEVEL2,EXIT=9;
```

The dial plan must be adapted accordingly.

Such a configuration may be required if ambiguities appear between extensions and local codes during the merging of networks. In Figure 61, for example, Subscriber 636 could exit in physical node 1-1-91. The dialing of 636 by a subscriber in 1-1-91 should then lead to internal subscriber 636, while the dialing of 9-636-xxxx should lead to the partner node.

The last configuration examples have shown different types of analysis for the dial pattern. Principally, the analysis of the dial pattern consists of the digit analysis (AMO WABE) and LCR dial plan (AMO LDPLN) steps. If required, a loop back to the digit analysis (AMO WABE) can be configured using the RERTEINT LDAT attribute.

IMPORTANT: Configure the analysis of the dial pattern in as few steps as possible.

5.21.2.4 NNO Determination

A call in OpenScape 4000 is assigned a source and a destination node number (NNO/DNNO). NNOs are used by number formatting AMOs such as KNFOR, KNMAT, KNDEF etc.

For outgoing calls, the destination NNO is taken from RICHT and also LDAT (should DNNO be entered).

For incoming calls, the source NNO is determined differently depending on device type:

- For Central Office TDCSU device types, the node number is taken from NNO in TDCSU. However if COT DCCO is set, reverse lookup is used.

  Central Office device type examples are S0COD, S1COD, S2COD, HG3550CO...

- For TIE devices, the node number is taken from NNO in TDCSU when COT DFNN is set.

  If COT DFNN is not set, reverse lookup is used unless a NNO is received in protocol messaging (e.g. when connected to another 4K).

  HINT: If partner 4K node has COT LWNC set, then no NNO is sent.

  TIE device type examples are S0CONN, S2CONN, HG3550IP...

To clarify, the behaviour is different (reversed) for CO and TIE trunks, but COT DFNN/DCCO can be used to toggle the default behaviour.

Reverse look-up uses the incoming Calling Party Number to derive the destination NNO by evaluating the WABE/LCR process and establishing if there is an outgoing route leading to this number. If a route is found, the node number (DNNO) will be taken from that outgoing LCR ROUTE (RICHT/LDAT). If no LDPLN match is found, then the node number is taken from TDCSU. To be explicit, this means the same NNO is assigned for an incoming call that would be used for an outgoing call dialling the same number. This behaviour is often needed by systems with multiple KNDEF entries.

HINT: Any DNNO configured in LDAT will be used instead of RICHT DNNO.

Application examples:

- To derive different Node values for multiple E164 numbers on an IP Trunk
- To differentiate number modification for systems with KNDEF entries across multiple country codes.
- Numbers from a foreign system that might use multiple different area codes.
- Open numbering to 3rd party network where partner system cannot insert TIE codes with calling number.
- UC deflect binding where the default KNDEF node is different to the E164 number needed

The flexibility of the 'reverse look-up' feature is also apparent when multiple systems are networked with open numbering to one trunk. If the calling numbers of each system can be evaluated, it is then possible to define different node numbers for each system. This then means KNMAT can be used to modify different prefixes to the calling parties i.e. system 1 with 123, system 2 with 134 etc i.e. KNMAT can make a modification for each node number that was derived from LCR, even though the calls arrived on the same physical trunk.

Example Processing for Reverse Look-Up:

(HINT, these number modification HISTA messages are produced according to DIAGS configuration. Check AMO descriptions for DIAGS (CP2) switches for how to activate).

- Explicit number, 22233344412888 -ISDN/inter, received in incoming Setup via TDCSU with NNO=1-1-699;
- Conversion to implicit follows: 00022233344412888
- A route for this digit pattern is not found, reverse look up fails and the node ID from TDCSU is used.

```
F4066 M8 N8675 NO ACT BPA CP ADVISORY 18-06-13 22:24:55
ALARM CLASS:CENTRAL:023
FORMAT:49
TEST: IN IN CPB, CALLING
ORIGIN: 1- 1- 699 DESTIN: 1- 1- 781
 BITS:0123456789012345678
```

```
22233344412888 ISDN inter 1- 1- 699 --012-----D--------
00022233344412888 ISDN unknown U-012-----DI-------
```

- Outgoing route is added, the incoming CLI will now be found in LCR

```
ADD-RICHT:MODE=LRTENEW,LRTE=222,NAME="REVERSELOOKUP2",
TGRP=69,DNNO=1-1-222;

ADD-
LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP="0"-"W"-"00"-"222"-"Z",
LROUTE=222,LAUTH=1;
```

- Source node (ORIGIN) becomes 1-1-222:

```
F4066 M8 N8678 NO ACT BPA CP ADVISORY 18-06-13 22:29:43
ALARM CLASS:CENTRAL:023
FORMAT:49
TEST: IN IN CPB, CALLING
ORIGIN: 1- 1- 222 DESTIN: 1- 1- 781
 BITS:0123456789012345678
22233344412888 ISDN inter 1- 1- 222 --012-----D--------
00022233344412888 ISDN unknown U-012-----DI-------
```

5.21.3 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
KNDEF	KNNR	d	virtuelle Knotennummer (0-0-0 = Rest der Welt)
	NNO	e	virtual node number (0-0-0 = rest of world)
	TYP	d	Typ des virtuellen Knotens (eigen oder fremd).
	TYPE	e	type of virtual node (own or foreign).
	ISDNCC	d	ISDN Landeskennzahl (country code). Standardwert: * (keine Landeskennzahl)
	ISDNCC	e	ISDN country code. Default value: * (no country code)
	ISDNAC	d	ISDN Ortskennzahl (area code). Standardwert:* (keine Ortskennzahl)
	ISDNAC	e	ISDN area code. Default value: * (no area code)
	ISDNLC	d	ISDN Hauptanschlussnummer (local destination code). Standardwert: * (keine Hauptanschlussnummer)

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	ISDNLC	e	ISDN local destination code. Default value: * (no local destination code)
	ISDNSK	d	ISDN Skip Digits.
	ISDNSK	e	ISDN skip digits.
	ISDNUL	d	ISDN lowest unique level
	ISDNUL	e	ISDN lowest unique level
	PNPL2C	d	PNP Level 2 Code. Standardwert: * (kein Level 2 Code)
	PNPL2C	e	PNP level 2 code. Default value: * (no level 2 code)
	PNPL1C	d	PNP Level 1 Code. Standardwert: * (kein Level 1 Code)
	PNPL1C	e	PNP level 1 code. Default value: * (no level 1 code)
	PNPLC	d	PNP Local Code (Level 0 Code). Standardwert: * (kein Local Code)
	PNPLC	e	PNP local code (level 0 code). Default value: * (no local code)
	PNPSK	d	PNP Skip Digits.
	PNPSK	e	PNP skip digits
	PNPUL	d	PNP lowest unique level
	PNPUL	e	PNP lowest unique level
	KNOTENKZ	d	Knotenkennzahl für Rufnummernplan unknown. Standardwert: ****** (keine Knotenkennzahl)
	NODECD	e	Node access code for numberingplan unknown. Default value: ****** (no node access code)
	KNOTKZSK	d	Skip Digits für Knotenkennzahl (Param. KNOTENKZ).
	NODECDSK	e	Skip digits for node access code (parameter NODECD).
	CACP	d	CAC-Präfix. Standardwert: * (keine CAC-Präfix)

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	CACP	e	CAC prefix. Default value: * (no CAC prefix)
KNFOR	ZKNNR	d	Zielknotennummer
	DNNO	e	destination node number
	NPI	d	numbering plan identifier
	NPI	e	numbering plan identifier
	TONIN	d	Type of number für ankommenden Endverkehr
	TONIN	e	Type of number for incoming traffic
	TONOUT	d	Type of number für abgehenden Verkehr
	TONOUT	e	Type of number for outgoing traffic
	SCRE	d	screening indicator
	SCRE	e	screening indicator
	FEHLOPT	d	Fehleroptionen für TONOUT Option
	ERROPT	e	error option for TONOUT handling
KNPRE	TON	d	Typ der Rufnummer
	TON	e	type of number
	NPI	d	numbering plan identifier, rufnummernplan
	NPI	e	numbering plan identifier
	AUSSTIEG	d	Ausstiegskennzahl
	EXIT	e	exit code
KNMAT	EBENE	d	ebene der Knotennummern
	LEVEL	e	level of nodenumbPKNOTKZPKNOTKZers
	NPI	d	numbering plan identifier, rufnummernplan
	NPI	e	numbering plan identifier
	UKNNR	d	Ursprungsknotennummer
	ONNR	e	origin node-number

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	ZKNNR	d	Zielknotennummer
	DNNO	e	destination node number
	ZERG	d	Ziffernergänzung,loe=*****,eigen=#####
	NUMEXT	e	number extension,delete=*****,own=#####
	ZKUE	d	Ziffernkuerzung,loe=*****,eigen=#####
	NUMRED	e	number reduction,delete=*****,own=#####
WABE	RNR	d	Rufnummer
	CD	e	access code / station number
	KZP	d	Kennzahlpunkt
	DAR	e	Digit analysis result
	WABE	d	Wabegruppe
	DPLN	e	feature access group / dial plan
ZAND	TYP	d	Auswahl des Datentyps
	TYPE	e	Desired system option
	PKNNR	d	Dreistufige Knotennummer zur eindeutigen Identifikation des Knotens im Netz.
	PNNO	e	Node number (until 3 levels) for unambiguous identifaction in network
	PKNOTKZ	d	Kennzahl eigener Knoten.
	PNODECD	e	Physical node number

(AMOs for LCR, see Chapter 36, "LCR (Least Cost Routing)")

5.22 PIN and Follow-Me Network-Wide

5.22.1 Feature Description

Users in local OpenScape 4000/HiPath 4000 networks (i.e. confined to one company building/location) are to be able to use the "network-wide PIN" feature similarly to the previous system-wide PIN function, for manual PINs and chip

cards. In corporate networks distributed over different sites/locations, some limitations must be expected.

IMPORTANT: : Setup of network-wide PIN and network-wide follow-me is described in the Chapter 132, "PIN (Personal Identification Number)".

The following data and functions of a user's "home" station are available and usable at "foreign" stations in a network:

1) Authorizations

- Individual authorizations for external calls (COS1 / LCRCOS)
- Internal traffic restrictions group no. (ITRGR)
- Dial plan group no. (DPLNGR)

2) Display data

If a user sets up a call after activating his/her PIN at a foreign station, called users will see the calling user's own display name and number instead of that of the "foreign user's" station. If the calling user has a secret station number, this will be taken into account accordingly. Depending on the COPIN assigned to the user (class-of-PIN), called users may alternatively still see the "foreign" station data instead of the calling user's home station data.

3) CDR data

For call data recording purposes, either the station number of the home station or the number of the foreign station is entered in the CDR data record, depending on the COPIN.

4) Mailbox LED (MB)

When a user activates his/her PIN at a foreign station, the MB-LED of the foreign station will indicate new messages in the VMS or TCS mailbox of the user's home station.

5) Follow-me

Call forwarding to a foreign station can be activated at the foreign station as follows (follow-me feature):

a) if PIN is activated: by pressing the FWD key for fixed call forwarding, or dialling the appropriate variable call forwarding code procedure.

b) if PIN is not activated: via the Service Menu

6) SMART

If the user's home station is configured as a virtual station (a.k.a. "fictitious user"), the call forwarding mode can be switched over from variable FWD (follow-me) to fixed FWD (e.g. to the user's voice mailbox) at the "foreign" station. This function can also be configured for "real" stations/users.

7) Project code (PCODE) verification

The "PCODE" feature is intended to allow project-specific call charges and feature authorizations to be assigned to a project code. The PCODE number is not assigned to a specific user or home station. This means that it is not possible to determine ad hoc which node the PCODE is administered in.
In order to be able to use PCODES throughout a network, it is necessary to install an administrable network-wide algorithm for PCODES, according to which the PCODE can be verified and identified ("modulo" verification). This means that the PCODES are no longer stored in individual nodes of the network.

8) Restart protection

The active PIN identifications and existing follow-me activations are not lost after soft or hard restarts, or after duplex switchover.

5.22.2 Functions / Restrictions when using a PIN network-wide / external

Feature	Network-wide / external PIN
Transfer authorizations	For outgoing calls only, not for incoming calls. Authorizations for trunk and tie traffic only.
PIN for call detail recording	Yes
Follow me / FWD transfer. Caution: Note the restrictions for FWD and FNA	Yes
Speed dialing facility	The speed dialing facility is not transferred. The speed dialing facility index from the physical station and numbers from the local system list are used.
Individual speed dialing	No. Individual speed dialing cannot be used.
WABE	Only numbers from the WABE group are transferred. The corresponding WABE group of the external system is then valid. In other words, WABE groups or the generation of systems in the network should be consistent.
IBM SMART, CF switch	Yes (for virtual and physical stations).
ITR group	Only numbers from the ITR group are transferred. The corresponding ITR group of the external system is then valid.
Repertory dialing keys	Repertory dialing keys are not transferred. The repertory dialing keys on the physical station are used.
DSS keys	DSS keys are not transferred. The DSS keys on the physical station are used.
Redial	Not transferred. The redial key on the physical station is used.
Enter timed reminder	No. The timed reminder is valid for the physical station.

Feature	Network-wide / external PIN
Mailbox	Signaling via LED only, no scroll function available. In other words, you must use the corresponding VMS code to dial into the VMS. Although the physical station's callbacks are signaled, it is not possible to scroll through or perform callbacks when the PIN is active.

5.22.3 Terminals

Functional terminals (e.g. set 600) cannot be used as "foreign" stations in the sense described above. A user's home station can be any standard voice terminal. PIN entry at non-voice terminals is not supported.

5.22.3.1 Activating and Deactivating a Network-Wide PIN

Users with network-wide PINs only enjoy a subset of the current features available with the standard, system-specific PIN feature. For example, "name" keys (programmable keys) and individual speed dialling destinations programmed at the home station cannot be accessed.

PINs can be enabled for network-wide use or limited to system-specific (node-specific) use by setting the appropriate bit flag in the system's feature bit string. It is not possible to activate both types of PIN usage for PINs within the same PABX.

Users have two possible options for identifying themselves via PIN within a OpenScape 4000/HiPath 4000 network:

- By entering the appropriate "APIN" code, i.e. entering the home station number followed by the assigned PIN (manual PIN)
- By inserting their chip card and entering their home station number
- from V2.0 by inserting the Smart Card

The code for deactivating the PIN (if necessary) is the same for all PIN types. Users simply enter the "DPIN" code or pull out the card.

5.22.3.2 Identification via "APIN" Code (Manual PIN)

The "APIN" code, i.e. the home station number followed by the assigned PIN, must be entered as follows:

CDAPIN + STNOhome stno + # + PIN + #

(Note: STNOhome stno = CDnode number + STNOhome station/extension number)

The delimiter between the station number and the actual PIN is the "#" character.

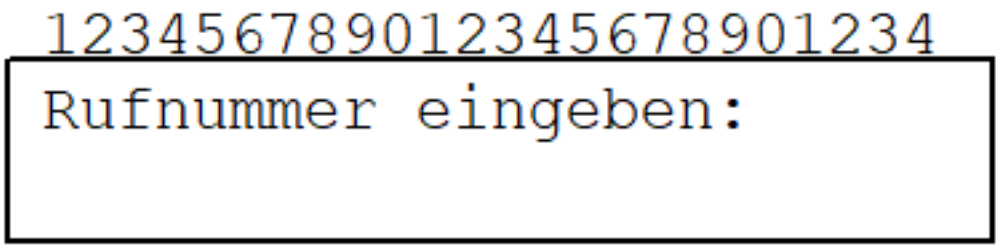
In networks with open numbering schemes, users must enter the node number assigned to their "home" node in front of their home station number. If entering

a PIN identification procedure within their own node, users can omit the node number.

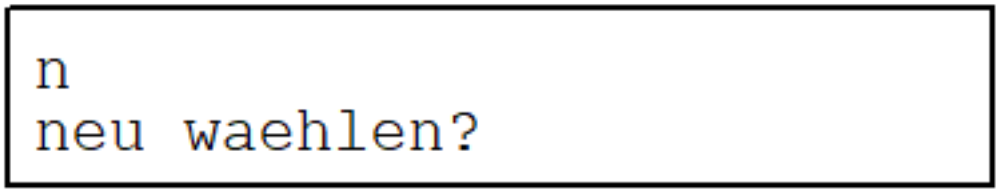
As a positive acknowledgement, the display will show "Identifikation STNOhome stno" ("Identification: STNOhome stno"). For wrong PIN or wrong home station number entries, "nicht erlaubt" ("not allowed") will be displayed as a negative acknowledgement. For other wrong entries, "nicht moeglich" ("not possible") will be displayed as a negative acknowledgement. For Digites without display units, the appropriate positive or negative acknowledgement tone or announcement will be heard instead.

Users receive the following display outputs when identifying themselves:

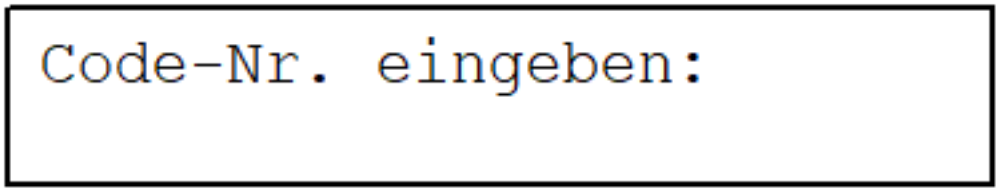
1. Input: CD APIN



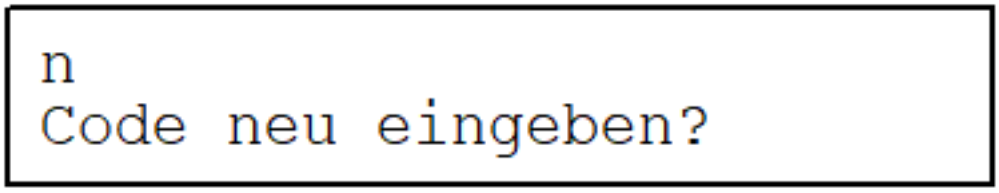
2. Input: 1st digit of STNO home stno



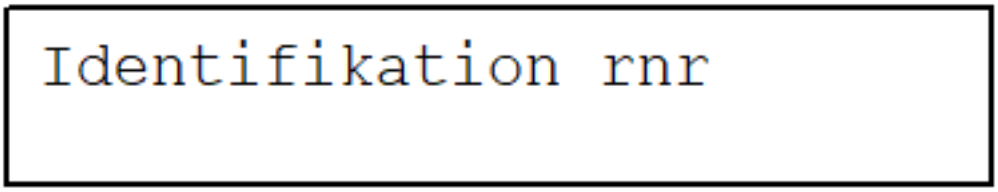
3. Input: remaining digits of STNO home stno + #



4. Input: 1st digit of PIN



5. Input: remaining digits of PIN + #



IMPORTANT: stno is normally the user's home station number, but may also be the number of the "foreign" station used, depending on the user's COPIN.

Users have the option of correcting their entries at each stage of the procedure, i.e. the home station number or PIN entry can be repeated if mistakes are made during input.

5.22.4 Identification via Chip Card

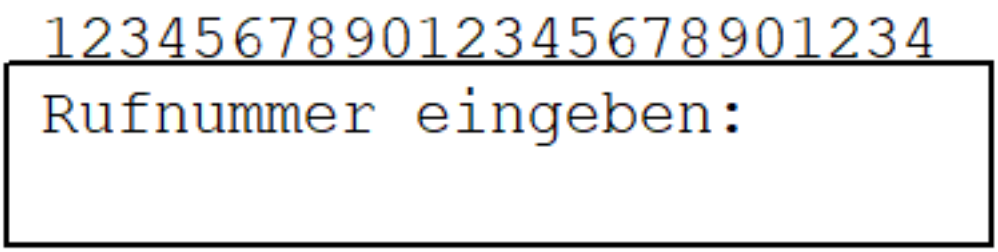
When the chip card is inserted, the telephone display will show "RUFNUMMER EINGEBEN:" ("PLEASE ENTER NUMBER") to prompt the user to enter his/her home station number. The delimiter (end character) between the station number and the actual PIN is the "#" character.

In networks with open numbering schemes, users must enter the node number assigned to their "home" node in front of their home station number. If entering a PIN identification procedure within their own node, users can omit the node number.

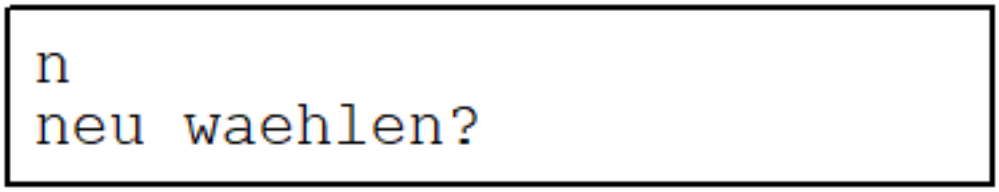
As a positive acknowledgement, the display will show "Ausweis STNOhome stno" ("ID card STNOhome stno"). For wrong PIN or wrong home station number entries, "nicht berechtigt" ("not authorized") will be displayed as a negative acknowledgement. For other wrong entries, "nicht moeglich" ("not possible") will be displayed as a negative acknowledgement. For Digites without display units, the appropriate positive or negative acknowledgement tone or announcement will be heard instead.

Users receive the following display outputs when identifying themselves:

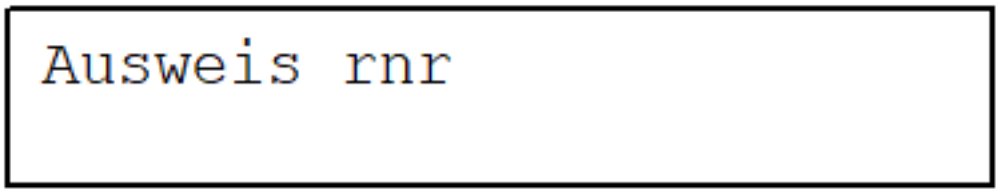
1. Input: Insert chip card



2. Input: 1st digit of STNO home stno



3. Input: remaining digits of STNO home stno + #



IMPORTANT: stno is normally the user's home station number, but may also be the number of the "foreign" station used, depending on the user's COPIN.

Users have the option of correcting their entries at each stage of the procedure, i.e. the home station number entry can be repeated if mistakes are made during input.'

From V2.0, you no longer need to use the 'SCAA' application for activation of the mobile station with chip card or smart card.

5.22.5 Input Procedure for Network-Wide Follow-Me

The "Follow-Me" feature allows variable call forwarding of calls to the user's home station to the foreign station currently in use (i.e. programming and activation). The network-wide follow-me feature is a subset of the feature "Remote CF by Station". The activation and deactivation of the follow-me feature via the FWD key, for the voice service, can only be carried out at foreign stations in idle state. If the foreign station is in any state not equal to "idle", the display will show "NICHT MOEGLICH" ("NOT POSSIBLE") as a negative acknowledgement. The activation or deactivation of the follow-me feature via the CHECK function is also possible during an ongoing call. The following options are available for activating/deactivating the follow-me feature:

- if PIN active or chip-card inserted: by pressing the FWD (call forwarding) key.
- if PIN active or chip-card inserted: by dialling the appropriate code for "Variable FWD on/off"
- if PIN active or chip-card inserted: via the idle telephone menu
- with or without active PIN: via Service Menu

The follow-me option is displayed on the foreign terminal if the home station user's PIN is active. If the user's PIN is not active, the display shows "Umleitung eingeschaltet" ("Call forwarding activated"). For wrong entries, "nicht moeglich" ("not possible") will be displayed as a negative acknowledgement. For Digites without display units, the appropriate positive or negative acknowledgement tone or announcement will be heard instead.

The call forwarding option is shown on the telephone displays of the home station and foreign station concerned, and indicated with the FWD LED, in the same way as for the "internal" follow-me feature. The active call forward status at the user's home station is additionally indicated at the foreign station with a special dial tone.

5.22.5.1 Follow-Me Activation/Deactivation with the FWD key (PIN/Chip Card Active)

If the home station user's PIN is active, simply pressing the FWD key on the foreign station will switch over the call forwarding function at the user's home station. This means: if call forwarding is already activated at the user's home station, it will be deactivated. If no call forwarding is activated at the user's home station, variable call forwarding to the foreign station in use will be activated (follow-me).

If the user's home station is a virtual station ("fictitious user"), an existing call forwarding activation is not only deactivated, but immediately re-activated to the fixed call forwarding destination programmed for the user's home station (if programmed). This function can also be used by users with "real" home stations (depends on COPIN).

5.22.5.2 Follow-Me Activation/Deactivation by Dialling the Codes for "Variable Call Forwarding On/Off" (PIN/Chip Card Active)

Provided the home station user's PIN is active, dialling the code for "Variable call forwarding on" will automatically program and activate the follow-me function. Dialling the code for "Variable call forwarding off" deactivates any call forwarding activated at the user's home station. The codes can be dialled at any digital terminal.

5.22.6 Follow-Me Activation/Deactivation via Service Menu:

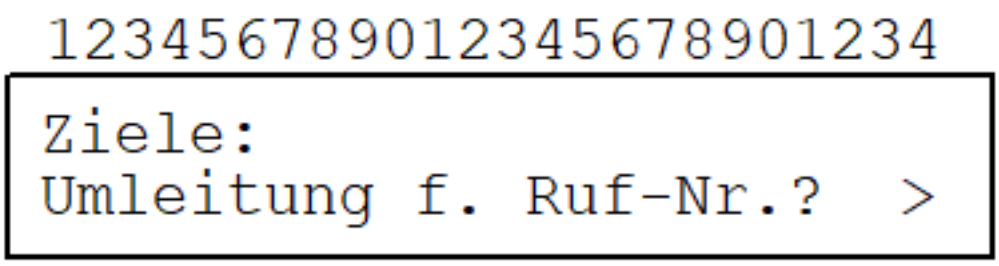
The follow-me function can be activated via the Service Menu function regardless of whether the home user's PIN is active or not.

5.22.6.1 Activating Follow-Me via the Service Menu

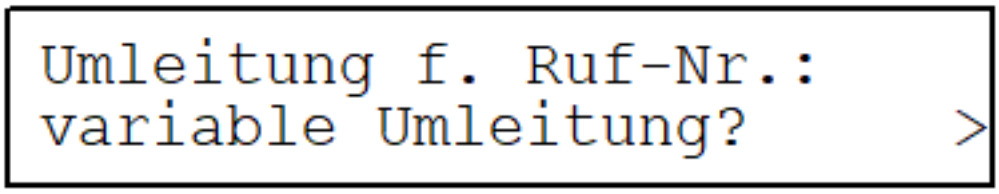
In the "Destinations" menu, a sub-menu option will be installed for activating the "Remote-CFU" feature.

Menu text for activating follow-me in the "Destinations" menu:

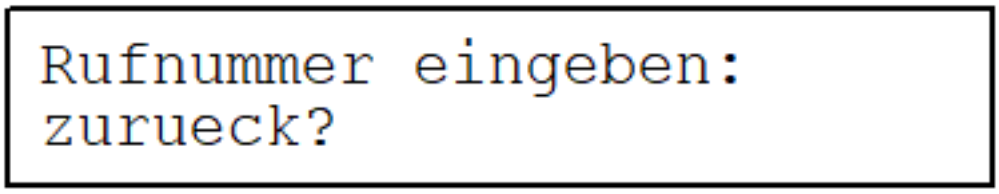
1. Input: press Service Menu key, browse to "Destinations" - press "Yes" key



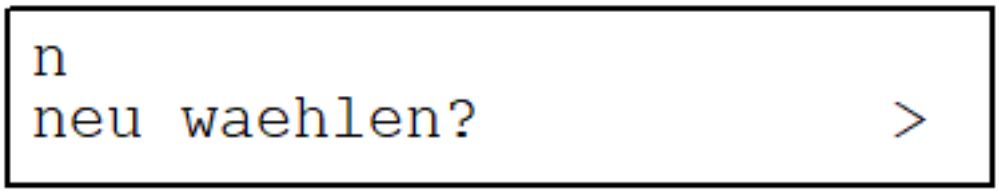
2. Input: "Yes" key



3. Input: "Yes" key

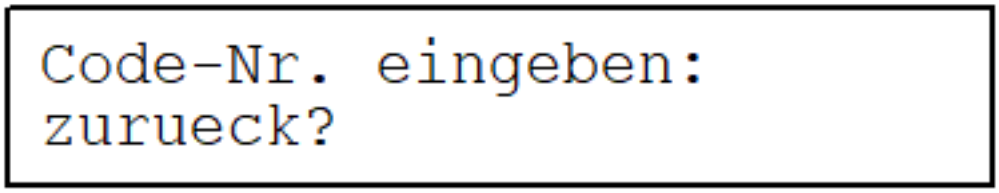


4. Input: 1st digit of STNO home stno

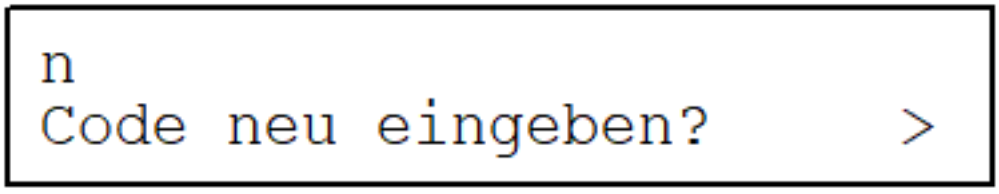


(scroll with "Next"/"Back" keys until: `zurueck? >`)

5. Input: remaining digits of STNO home stno + #

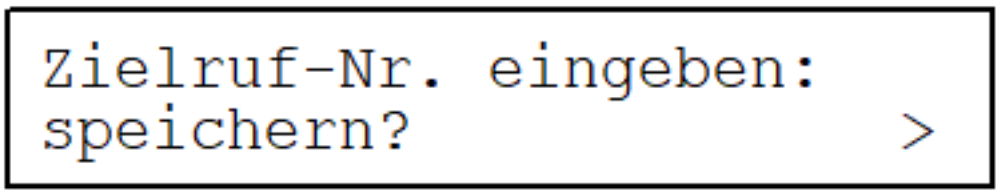


6. Input: 1st digit of PIN



(scroll with "Next"/"Back" keys until: zurueck? >)

7. Input: remaining digits of PIN + #



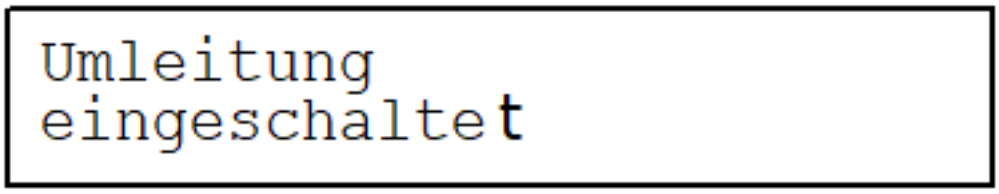
(scroll with "Next"/"Back" keys until: zurueck? >)

8. Input: (1st digit of STNO destination stno)

(scroll with "Next"/"Back" keys until: neu waehlen? >) (scroll with "Next"/"Back" keys until: zurueck? >)

9. Input: (remaining digits of STNO destination stno +) (#)

10. Input: "Yes" key



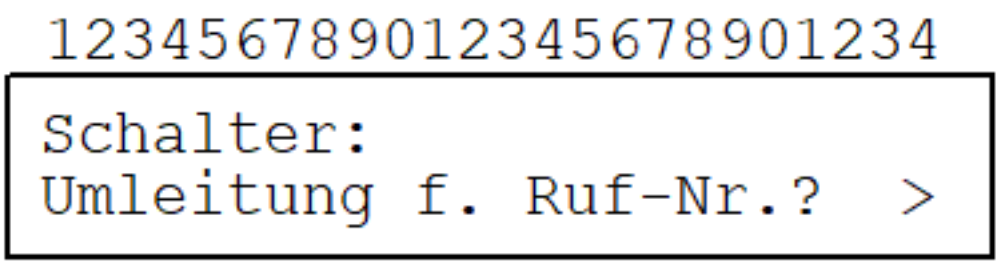
IMPORTANT: Input in brackets ( ) = optional For activating follow-me, it is not necessary to enter the destination number. If the home station user's PIN is active, users do not need to repeat the PIN and home station number entries, but must enter the delimiter "#". With "zurueck" ("back"), users are returned to the next highest menu level, e.g. back to the "Umleitung f. Ruf-Nr.? >" option of the "Destinations" menu.

5.22.6.2 Deactivating Follow-Me via the Service Menu

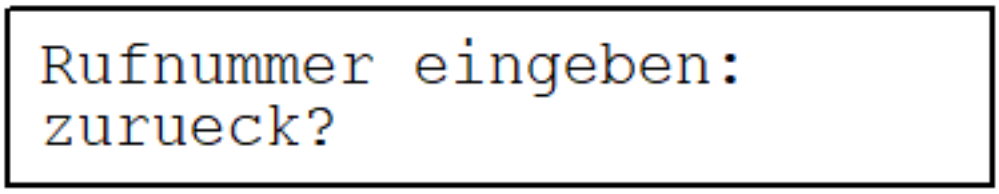
In the "Switches" menu, a sub-menu option will be installed for deactivating the "Remote-CFU" feature.

Menu text for deactivating follow-me in the "Switches" menu:

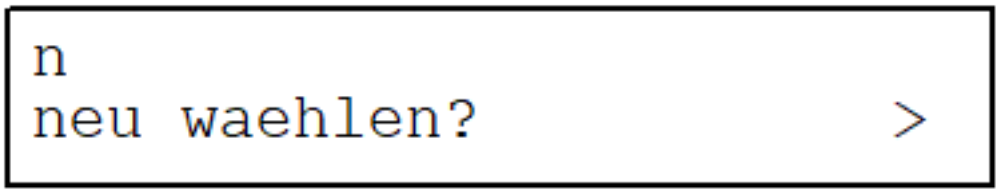
1. Input: press Service Menu key, browse to "Switches" - press "Yes" key



2. Input: "Yes" key

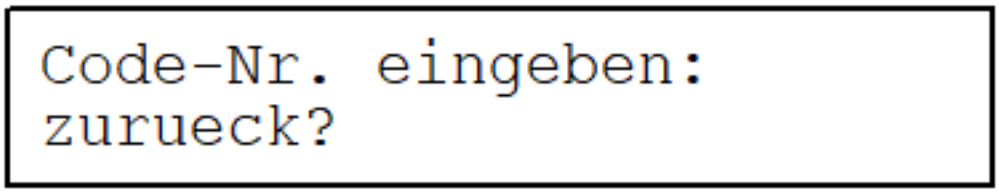


3. Input: 1st digit of STNO home stno

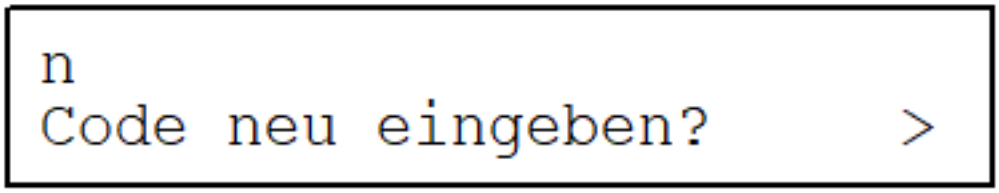


(scroll with "Next"/"Back" keys until: zurueck? >)

4. Input: remaining digits of STNO home stno + #

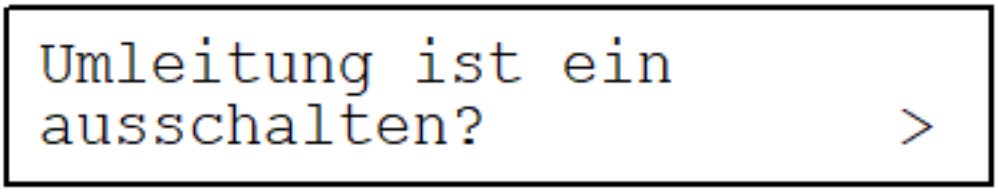


5. Input: 1st digit of PIN



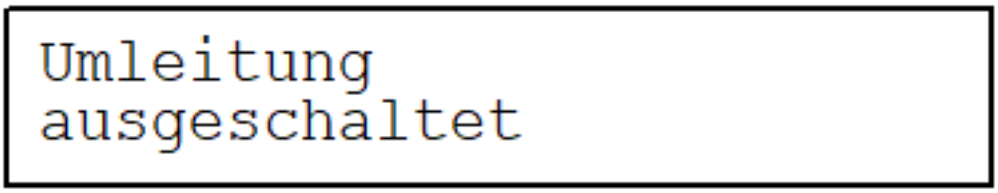
(scroll with "Next"/"Back" keys until: zurueck? >)

6. Input: remaining digits of PIN + #



(scroll with "Next"/"Back" keys until: Ziel anzeigen? >) (scroll with "Next"/"Back" keys until: naechster Schalter? >) (scroll with "Next"/"Back" keys until: zurueck? >)

7. Input: "Yes" key



IMPORTANT: If the home station user's PIN is active, users do not need to repeat the PIN and home station number entries, but must enter the delimiter "#". With "zurueck" ("back"), users are returned to the next highest menu level, e.g. back to the "Umleitung f. Ruf-Nr.? >" option of the "Switches" menu.

5.22.7 PIN Deactivation

The PIN can be deactivated as follows:

- with the PIN code
- in the service menu
- by removing the chip card/smart card (V2.0 and higher)

Message exchange for PIN deactivation

1) PIN deactivation at the third-party station

When you deactivate the PIN at the third-party station, the foreign node sends a PIN deactivation messages to the home node. This informs the home node that the PIN was deactivated and deletes the station number of the foreign station in your memory.

2) PIN deactivation from the home station to the foreign station

The mobile user should not be identified at multiple stations simultaneously because the status of the home station can only be updated at one foreign station. If the mobile user is identified at a second foreign station, an identification existing at another station should be automatically deleted. To do this, the home station sends a PIN-deactivation message to the first foreign station where PIN deactivation is performed. If the connection between the home and foreign system breaks down, the first identification remains intact because the deactivation message to the foreign station is not repeated. The PIN remains active at the foreign station. Consequently, the mobile user cannot be sure that the first identification was automatically deactivated when entering the PIN at another station. The home data can

only be updated at the station where the mobile user was last identified because only this station is known to the home station.

5.22.8 Network-Wide PIN and Follow-Me in 1 Step

When you activate a long PIN, the follow-me function can be automatically activated. This feature is automatically deactivated when you deactivate a PIN.

For information on configuring this function, see the PIN chapter.

5.23 Preventing Connections

5.23.1 Single Level Network

The node connection matrix can be set so that connections between certain network nodes are inhibited. AMO KNMAT is used for this.

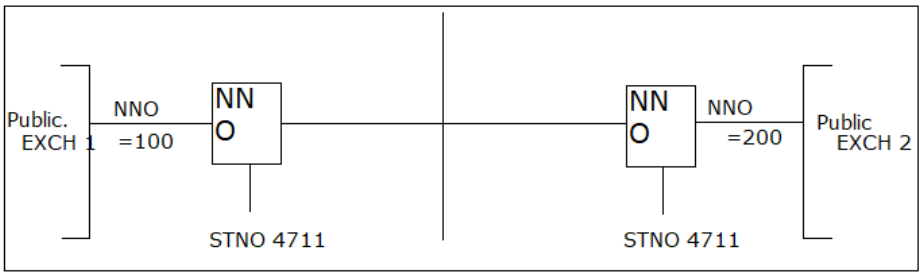


Figure 60: Preventing Connections

The two exchanges are assigned different node numbers. These are allocated with AMO TDCSU or TACSU, parameter NNO.

1) Calls from a public exchange are to be prevented from being switched via the PABX network to another public exchange. At the same time, the forwarding of stations in the PABX network to the public exchange at any point is not to be prevented, e.g. in order to utilize the cost benefits involved.
NNO 010: CHANGE-KNMAT:LEVEL=0,ONNO=200,DNNO=100,CONN=D;
NNO 020: CHANGE-KNMAT:LEVEL=0,ONNO=100,DNNO=200,CONN=D;

2) If, for example, it is not to be possible for subscribers in Exchange 1 to access subscriber 924711 by way of the tie trunk (e.g. because expensive private-network leased lines are used for such connections), the following must be configured: NNO 010: CHANGE-KNMAT:LEVEL=0,ONNO=100,DNNO=20,CONN=D;

3) If subscribers in Exchange 2 are likewise not to be permitted to use the tie trunk, the following must be configured: NNO 020: CHANGE-KNMAT:LEVEL=0,ONNO=200,DNNO=10,CONN=D;

IMPORTANT: Since the node numbers in the network are unambiguous, the commands can be entered in all network nodes.

Since all other connections are permissible, the default setting is retained for them.

5.23.2 Multi Level Network

It is possible to configure multi level networks. In all network nodes however, the node numbers must have the same graduation. You are able to deny connections level individual.

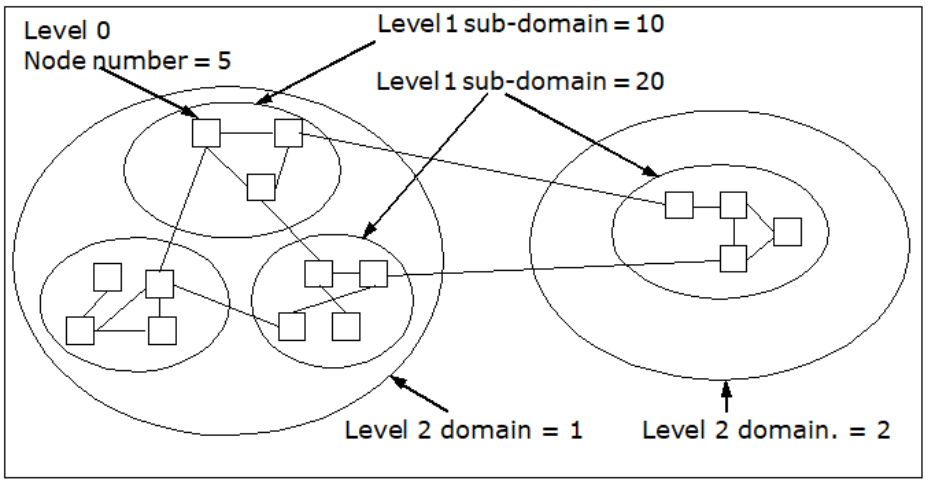


Figure 61: 3-Level Network

Example 1

You can configure in one or in all network nodes, that e.g. connections between Level 2 domain 1 and 2 are to be denied:
`CHANGE-KNMAT:LEVEL=2,ONNO=1,DNNO=2,CONN=D;`

IMPORTANT: Note that Node numbers / Sub-domains (Level 0 / 1) are not unique within the network. if the network numbering scheme comprises higher levels than the specified one.

Example 2

`CHANGE-KNMAT:LEVEL=1,ONNO=10,DNNO=20,CONN=D;`

Since the levels are handled seperately, this command prevents all connections between 1-10-xxx and 1-20-xxx, but also between 1-10-xxx and 2-20-xxx (xxx means any Level 0 node number).

The anolog handling will occur if you use level 0 node numbers in KNMAT which are defined within several sub-domains / domains, i.e. which are not unique.

For denying connections between node numbers in level 0, see Single Level Network.

5.24 Public PRI Networking

5.24.1 Feature description

This feature provides the capability for a OpenScape 4000 customer the ability to access a wide range of U.S. public network calling services and supplementary services via a PRI access interface. The US PRI protocols supported are:

- for LEC-access (Local Exchange Carrier): ATT4ESS and NI2
- for IEC-access (Inter Exchange Carrier): ATT4ESS, MCI-DMS250, MCI-DEX600, SPRINT-DMS250

5.24.1.1 Supplementary Services

The following table shows a list of supported Supplementary Services. (X = supported)

Table 12: Supplementary Services

Supplementary Service	ATT4ESS	MCI-DMS250	MCI-DEX600	SPIRNT-DMS250	NI2
Call-by-Call Service Selection	X	X	X	X	X
Dedicated Service Selection	X	X	X	X	X
Equal Access	X	-	-	-	X
Operator Access (using functional Signalling)	X	-	-	-	X
DNIS (Dialed Nr ID Service)	X	X	X	X	X
CLID (Calling Line ID))	X	X	X	X	X
COLI (Connected Line ID)	X	X	X	X	-
Redirecting Number	X	X	X	X	X
Network Name Display	-	-	-	-	-
Call Redirection	X	X	X		
Network Call Transfer - Network Call Transfer (MCI) - Two B-Channel Transfer (NI2)	-	X	X	-	X
User-to-User Signalling	X	X	X	-	-
B-Channel Management	X	X	X	X	X
PRI Span Initialization Restart Procedures	X	X	X	X	X
Additional Calling Part Number	X	X	X	X	X

Supplementary Service	ATT4ESS	MCI-DMS250	MCI-DEX600	SPIRNT-DMS250	NI2
CND (Calling Name Delivery)					X
ISDN-PRI (RN) Redirecting Number	X	X	X	X	X

5.24.1.1.1 ACPN (Additional Calling Party Number)

The ACPN is configured in SDAT. This is the public number to be sent out to the public network.

When the call is originated on the private NQ network, the LDAT LCR-Attribute PUBNUM must be set on the gateway switch to the public network. If LDAT LCR-Attribute PUBNUM is set the calling number is only replaced with a provided PUBNUM if the NPI (Numbering Plan Identifier) matches that of the called number. The received ACPN will replace the the calling number when the LDAT Attribute is set and is not subject to any modification from the usual KN-AMOs i.e. KNFOR, KNMAT.

If the LCR-Attribute PUBNUM is not set, then the subscriber extension number (modified by KN-AMOs) is sent out.

5.24.1.1.2 Network Call Transfer

This Supplementary Service is called Network Call Transfer for MCI and Two B-Channel Transfer by Bellcore (NI2). This service is invoked whenever a trombone connection on the same trunk to the public network exists (e.g. Transfer, Conference, ACD- off-sire routing,...). The COT NCT and the FEASU NCT must be set to enable this SS. The user has not indication of when the NCT takes place. CDR and Trafic Metering record successfull NCTs.

5.24.1.1.3 Calling Services

There are incoming, outgoing Calling Services which can be requested on Call-by-Call or Pre-Provisioned. Outgoing Call-by-Call Calling Services are configured in LDAT, Pre-Provisioned (Dedicated) Calling Services are configured in TDCSU.

Outgoing Call-by-Call Calling Services shall only be configured on the Gateway switch to the public network. Incoming Calling Services will be sent over the private NQ network for CDR purposes.

Table 13: Calling Service

Calling Service	AT&T	MCI	SPRINT	NI2
NONE	POTS	POTS	POTS	POTS
INWATS	Toll-Free Megacom	MCI 800/888/877	Ultra 800/888/877	In-WATS
INTLWATS	International Toll-Free	-	-	-
PPC900	MultiQuest	MCI 900	-	-

Calling Service	AT&T	MCI	SPRINT	NI2
LDS	Long Distance Service	-	-	-
OUTWATS	Megacom	Prism	Ultra WATS	Out-WATS
WB0-WB9	-	-	-	Multiband Out-WATS
VPN	SDN	Vnet	VPN	-
FX	-	-	-	Foreign Exchange
TTa	-	-	-	Tie Trunk Access
SDS	Accunet	-	-	-

5.24.1.1.4 Equal Access

Equal Access can be requested by LCR (AMO-LDAT) or by the user dialing a CIC (e.g. 9-101-0288-1-561-923-1446). This is an outgoing only feature and can be requested from the private CorNet-N/NQ network. Equal Access s only available for LECs where the DEDSCC parameter of AMO-TDCSU is set to NONE.

5.24.1.1.5 CND (Calling Name Delivery)

If a name server is connected to a switch the calling name information can be received in a delayed FACILITY message instead of the SETUP message. The delayed information is then shown on the user display.

The calling name delivery feature can be disabled by adding the COT BKNA to the trunk.

Traffic metering is expanded with three system wide peg counters:

- Calling name informations in SETUP message.
- Calling name informations in delayed FACILTY message.
- Calling name informations not available.

This feature is only supported with NI-2 or CorNet-NQ.

5.24.1.1.6 ISDN-PRI RN (ISDN-PRI Redirecting Number)

ISDN-PRI Redirecting Number provides support for sending of the ISDN-PRI Redirecting Number (RN) of the originally called party for e.g 0# transfers out of PhoneMail to PRI Software Defined Network (SDN).

This feature affects only calls that are transferred out of applications (e.g PhoneMail, Xpressions, or the new Multimedia Messaging Server (codenamed "Saturn") using the official transfer CorNet-NQ procedure SS-SSCT to ISDN-PRI trunk.

5.24.1.1.7 ACPNAME (Additional Calling Party Name)

The ACPNAME (PUBNAME) is configured in SDAT. This is the public name to be sent out to the public network.

Within one OpenScape 4000 system, the LATTR PUBNAME in LDAT is the trigger to send the PUBNAME instead of the PERSI name, for any type of trunk, not only for CO.

There is no transport of PUBNAME information element via Cornet, therefore the trigger to send the PUBNAME instead of the PERSI name is at the outgoing point, where the first trunk is seized and call leaves OpenScape 4000 where PUBNAME is configured, even if this is not the break out point (i.e. the last PBX before the public network). If PUBNAME is not set as LATTR in LDAT, the PERSI name is sent.

5.24.2 User Interface

5.24.2.1 CND (Calling Name Delivery)

When a calling name information is received the new name information is shown on the user display.

5.24.2.2 ISDN-PRI RN (ISDN-PRI Redirecting Number)

The only user interface impacted by this feature is that of the destination of the transfer out of SSCT. This user will receive indication of a redirecting number of the party that the caller who invoked SSCT originally attempted to call. The way the redirecting number is presented to that destination is outside the scope of this specification.

5.24.3 Service Information

The Public PRI Networking feature is intended for the North American marketplace.

The following features are also available:

- CND
- ISDN-PRI RN

5.24.4 Generation

- How to add the T1 board:

```
COPY-PRODE:TYPE=PVCD,PVCDNO=16;
/*loads the US protocols into memory

ADD-BCSU:MTYPE=TMD,LTG=1,LTU=1,SLOT=43,PARTNO="Q2192-
X",FCTID=2,
LWVAR="K", HWYBDL=A; /*configures T1 board

CHANGE-
LWPAR:TYPE=TMD,TMDTYPE=TMDMOS,BLNO=2,OPMODE=FRAMEESF&BISUB8ON&BDETO
```

```
CABLETYP=1,OESDISTH=30,OESREQTH=4,SESDISTH=10,SESREQTH=10,ACKTI
DLVTIM=600,OCTMAX=260,RETMAX=3,WINDOW=7; /
*loadware parameters for T1 board
```

- How to setup the trunk for NI2 without a dedicated calling service

```
ADD-
COT:COTNO=100,PAR=IIDL&IVAC&INAU&ITB&IDND&IFR&ANS&CEOC&
CEBC&COTN&IEVT&IDIS&LWNC&NLCR&ICZL&NCT&NTON;

ADD-COP:COPNO=100,PAR=SDL&BR64&RMSG&RRST&TIM1&IDP4;

ADD-
TDCSU:OPT=NEW,PEN=1-01-043-0,COTNO=100,COPNO=100,COS=1,LCOSV=9,
CCT="PRI",DESTNO=0,PROTVAR=NI2,SEGMENT=1,DGTPR=1,ISDNIP=561,ISD
PNPL2P=011,PNPL1P=1,NNO=1-1-99,TGRP=104,SRCHMODE=ASC,DEV=S1COD,
BCNEG=N,BCGR=1,IGN=1,IID=1,LWPAR=6,LWPP=2;
```

5.24.4.1 Calling Services

- How to setup the routing with the call-by-call service 'banded outwats - band 2'

```
ADD-RICHT:MODE=LRTENEW,LRTE=304,LSVC=ALL,NAME="E.164
 NAT.",
TGRP=104,DNNO=1-1-99,ROUTATT=YES,PDNNO=1-1-99;

ADD-LODR:ODR=304,CMD=ECHO,FIELD=3;

ADD-LODR:ODR=304,CMD=ECHOALL;

ADD-LODR:ODR=304,CMD=SENDCIC;

ADD-LODR:ODR=304,CMD=SENDOSA;

ADD-LODR:ODR=304,CMD=NPI,NPI=ISDN,TON=NATIONAL;

ADD-LODR:ODR=304,CMD=END;

ADD-
LDAT:LROUTE=309,LSVC=ALL,LVAL=1,TGRP=104,ODR=304,LAUTH=1,
CARRIER=1,
 ZONE=INTERN01,LATTR=PUBNUM&WCHREG,SCCID=0288,
FACILITY=2, SVCVCE=OUTWATS;

ADD-
LDPLN:LDP="9"-"1"-"561"-"923"-"XXXX",LROUTE=304,LAUTH=1;
```

5.24.4.2 B-Channel Management

- How to deactivate and activate B-Channels 1through 6:

```
DEA-DSSU:OFFTYPE=DI,TYPE=BCHAN,PEN1=1-1-43-0,BCHL=1&&6;
 ACT-DSSU:ONTYPE=AUL,TYPE=BCHAN,PEN1=1-1-43-0,BCHL=1&&6;
```

5.24.4.3 ACPN (Additional Calling Party Number)

- How to configure the ACPN of the originating station:

```
CHANGE-SDAT:STNO=3342,TYPE=DATA1,PUBNUM=915619233342,
TON=NATIONAL,NPI=ISDN;
```

5.24.4.4 CND (Calling Name Delivery)

- How to enable CND by COT (default)
  `CHANGE-COT:COTNO=120,COTTYPE=COTDEL,PAR=BKNA;`
- How to disable CND by COT
  `CHANGE-COT:COTNO=120,COTTYPE=COTADD,PAR=BKNA;`
- How to activate and reset the system counters
  `DISPLAY-ZAUSL:PROCID=BP,DEL=Y;`
- How to inquire the values of the system counters
  `DISPLAY-ZAUSL:PROCID=BP;`

5.24.4.5 ISDN-PRI RN (ISDN-PRI Redirecting Number)

- How to enable ISDN-PRI RN by COT (default)
  `CHANGE-COT:COTNO=120,COTTYPE=COTDEL,PAR=ORRN;`

5.24.5 Relevant AMOs

AMO	Parameter	Language	Description
PRODE	-	d	US PRI-spezifische Protokoll-Tabellen für die Länder USA & Kanada sind über die PVCD 16 verfügbar.
	-	e	US PRI protocols have been added. PVCD 16 is the new protocol variant for the counties US/Canada.
FEASU	-	d	NCT (Network Call Transfer) kann aktiviert/deaktiviert werden
	-	e	NCT (Network Call Transfer) can be activated/deactivated
BCSU	MTYP	d	MTYP=TMD für die T1-Board Konfiguration. (sehe T1 Adaption Leistungsmerkmal für mehr Details)
	MTYPE	e	MTYPE=TMD for configuration of T1 boards. (see T1 Adaption feature for more details)
COP	RRST/RMSG	d	RRST und RMSG müssen US PRI Protokolle gesetzt sein

AMO	Parameter	Language	Description
	RRST/RMSG	e	RRST and RMSG must be set for US PRI protocols.
COT	BKNA	d	Verhindert CND für den Trunk wenn gesetzt.
	BKNA	e	Disable CND for specific trunk if set.
	NCT	d	Erlaubt SS-NCT für angegebenen trunk
	NCT	e	Enable SS-NCT for specific trunk.
	ORRN	d	Aktivierung des Leistungsmerkmals ISDN-PRI RN für spezifische NW-Sätze.
	ORRN	e	Enable ISDN-PRI RN for specific trunk if set.
DSSU	TYP	d	TYP=BKANAL um einzelne B-Kanäle zu aktivieren/deaktivieren
	TYPE	e	TYPE=BCHAN to activate/deactivate single B-Channels
KNDEF	CACP	d	CAC Prefix (e.g. 101 for US)
	CACP	e	CAC Prefix (e.g. 101 for US)
LDAT	SOCC	d	Equal Access bei LCR
	SCCID	e	Equal Access using LCR
	DIENSTSP	d	Ruf-für-Ruf Calling Service für Sprache
	SVCVCE	e	Call-By-Call Calling Service for Voice
	DIENSTDT	d	Ruf-für-Ruf Calling Service für Nicht-Sprache
	SVCNVCE	e	Call-By-Call Calling Service for Non-Voice
	FACILITY	d	Ruf-für-Ruf Calling Service Parameter
	FACILITY	e	Call-By-Call Calling Service Parameter
	PUBNUM	d	Erlaubt ACPN (Additional Calling Party Number)
	PUBNUM	e	Enable ACPN (Additional Calling Party Number)

AMO	Parameter	Language	Description
LDPLN	LDP	d	Platzhalter 'J' zur Kennzeichnung von CIC digits
	LDP	e	Wildcard marker 'Y' to indicate CIC digits
LODR	SENDCIC	d	Das öffentlich Netz unterstützt Equal Access
	SENDCIC	e	Indicates Public Network supports Equal Access
	SENDOSA	d	Das öffentliche Netz unterstützt kommende Operator System Access über Fuctional Signalling
	SENDOSA	e	Indicates Public Network supports receiving Operator System Access using fuctional signalling
LWPAR	TYP/ TMDTYP	d	TYP=TMD und TMDTYP=MOS Zweige sind für T1-Board zugeführt. (sehe T1 Adaption Leistungsmerkmal für mehr Details)
	TYPE/ TMDTYPE	e	TYPE=TMD and TMDTYPE=MOS branch is added for T1 board. (see T1 Adaption feature for more details)
SDAT	PUBNUM, NPI, TON	d	Darstellung einer dem Teilnehmer zugeordneten öffentliche Number für US Provider
	PUBNUM, NPI, TON	e	Additional Calling Party Number (ACPN) to be sent to US Public Network
	PUBNAME	d	Darstellung einer dem Teilnehmer zugeordneten öffentliche Name für US Provider
	PUBNAME	e	Additional Calling Party Name (ACPNAME) to be sent to US Public Network
TDCSU	GER	d	Neuer Geräte Typ S1COD für US PRI Protokolle
	DEV	e	Device Type S1COD for US PRI protocols
	PROTVAR	d	Erweitert mit den 5 neuen US PRI Protokol Varianten
	PROTVAR	e	Enhanced with the 5 new US PRI protocol variants

AMO	Parameter	Language	Description
	DEDSCC	d	Festgelegter Carrier Identification Code für "IEC connected to" Anzeige(z.B. 0288 für AT&T)
	DEDSCC	e	Dedicated Carrier Identification Code indicating the IEC connected to (e.g. 0288 for AT&T).
	DEDSVC	d	Festgelegter (Voreingestelter) Calling Service
	DEDSVC	e	Dedicated (Pre-Provisioned) Calling Service
	FACILITY	d	Festgelegte Calling Service Parameter
	FACILITY	e	Dedicated Calling Service Parameter
	DITIDX	d	DIT Hotline Index zugewiesen in AMO-HOTLN
	DITIDX	e	DIT Hotline Index assigned in AMO-HOTLN
	TCCID	d	Telephone Company Circuit Indetification
	TCCID	e	Telephone Company Circuit Indetification
	IGN	d	Interface Group Number
	IGN	e	Interface Group Number
	IID	d	Interface Identifier
	IID	e	Interface Identifier
WABE	KZP	d	KZP=PRITEST für PRI Loopback Test Anrufem
	DAR	e	DAR=PRITEST for PRI Loopback Test calls
ZAUSL	NCT	d	Verkehrsmessung for erfolgreiche/ nicht erfolgreich NCT
	NCT	e	Traffic Metering for successfull/ unsuccessfull NCT
	N0056	d	Anzahl sofortiger CNAM deliveries (in Setup-Meldung)
	N0056	e	Number of immediate cnam deliveries (in Setup message)

AMO	Parameter	Language	Description
	N0057	d	Anzahl verspaeteter. CNAM deliveries (in Facility-Medlung)
	N0057	e	Number of delayed cnsm deliveries (in facility message)
	N0058	d	Anzahl erfolgloser call name deliveries (in Setup-Meldung)
	N0058	e	Number of failed call name deliveries

5.25 Public Network Exchange Signalling DTMF (Suffix Dialling)

This feature enables special functions which require DTMF suffix dialling, e.g. public services such as CITYCALL as well as Code-Calling with DISPLAY OPERATION, Voice Mail systems and dictation equipment in private telephone systems, to be used by all OpenScape 4000 voice terminals (ANATEs and DIGITEs) via the public network exchanges. This means converting suffix-dialled digits to DTMF signals on the exchange line, which is achieved by means of dial-up converters for lines without DTMF signalling, or simply by seizing a specific line with the necessary DTMF converter parameters by dialling the appropriate route code when setting up a connection. Callers switched via these routes by the attendant will not be able to use the converter functions. If a DTMF conversion route code is dialled, or a dial-up DTMF converter is called up during an established call (suffix-dialling), DIGITEs can receive a notification text on their displays. This text must be entered by means of an AMO. One SIU Type 2 module must be assigned for each LTG for receiving and transmitting the DTMF signals.

- Assign a SIU Type 2 (Q2031-X1) to each LTG:

  ```
  AD-
  BCSU:MTYPE=SIUP,LTU=number,SLOT=number,PARTNO=string;
  ```

  Please also refer to the BCSU AMO description "Assigning a SIU".

  In networked systems, the DTMF conversion is always carried out in the home node of the station.
- Assign the code for the dial-up DTMF converter in the DPLN:
  `AD-WABE:CD=key-num,DAR=DTMFCONV;`
- Assign the route code for the dial-up DTMF converter:

  ```
  AD-RICHT:TYPE=CD,CD=key-num,SVC=param,DTMFCNV=SUFDIAL
  ```

  or

  ```
  CHA-RICHT:TYPE=CD,CD=key-num,SVC=param,TYPE=DTMF,
  DTMFCNV=SUFDIAL;
  ```
- Assign the route code for the direct DTMF conversion route:

  ```
  AD-RICHT:TYPE=CD,CD=key-num,SVC=param,DTMFCNV=FIX;
  ```

- Enter display notification for DIGITEs with AMO RICHT and the following parameters:
  - DTMFDISP = Parameter for defining display output options, with the values:

WITHOUT	no display output
FTEXT	Displays text entered with RICHT AMO under parameter DTMFTEXT
DIGIT	Displays text entered with RICHT AMO under parameter DTMFTEXT plus last dialled digit
DIGIT	Displays text entered with RICHT AMO under parameter DTMFTEXT plus last six dialled digits

  - DTMFTEXT = Text for DIGITE display output, if parameter DTMFDISP has been declared with FTEXT, DIGIT or DIGITS. Possible values: alphanumeric string, up to 16 characters.

DTMF conversion is also possible for LCR routes.

The appropriate commands can be found in the AMO RICHT description.

5.26 REFTA Synchronization

The synchronization of TDM telecommunication networks has become very important with their digitalization. Voice, fax and modem signals are digitalized and transferred in real time. If the clock frequencies for digital coding of the A-side and for decoding on the B-side are not synchronous a bit slip occurs after a certain time, causing the loss or doubling of data. The resulting deterioration in quality varies on the basis of the service. Depending on the difference in frequency, the bit slip occurs after a certain time, i.e. at a certain bit slip rate and leads to total loss of service. Frequency synchronization can be achieved in various ways. The most cost-effective is master/slave synchronization, a procedure employed worldwide.

As transmission is asynchronous in Voice over Internet Protocol (VoIP), there is no need for synchronization plans here. However, the techniques specified here still apply to the remaining TDM connections with the result that multiple island networks often have to be considered. Each individual IPDA can have its own REFTA.

The following two tables are provided to aid understanding. The first shows the effect of a bit slip on the quality of the required service. The second shows the space of time with regard to the frequency difference.

Table 14: Effect of an individual bit slip

Service	Effect
Encrypted data	Without subsequent ARQ procedure no data can be decoded after the bit slip
Video	The picture is frozen for a few seconds, the sound produces a loud "crack"

Service	Effect
Digital data	Data is lost or doubled, the frame must be repeated, data throughput reduced
Fax	4 to 8 scan lines lost (strips) sometimes loss of connection
Modem data transfer within voice band	Transmission errors for a duration of 10 msec to 2 sec, sometimes loss of connection depending on the transfer rate
Speech compressed	Speech distorted, cracking sounds
Voice	Sometimes a "crack"

These tables show how quickly one small deviation in frequency can lead to considerable loss in quality and to the breakdown of the connection. It is possible to deduct the frequency difference and the most probable error cause from the interval between bit slips. Frequency differences of 10 to the power of minus nine and 10 to the power of minus eight are caused by free-running local exchanges or tracking oscillators. Frequency differences of 1 ppm have been noticed with smaller ISPBXs in hold over/free-run mode. Frequency differences greater than 5 ppm are caused by free-running transmission devices, i.e. it is likely that a synchronization chain is not thoroughly closed. Considerable frequency differences occur if regulation loops are caused. However, it can take several days for a regulation loop to result in an excessive frequency difference.

In the following table, E1 connections have a 125-Âµs buffer and 30 B channels.

T0 connections have a 24-Âµs buffer and 2 B channels here.

Table 15: Interval between two bit slips

Frequency departure delta f/f		Interval between two bit slips	
absolute	in Hz (at 2 MHz)	for E1	for T0
50 ppm	100	2.4 sec	0.48 sec
10 ppm	20	12.5 sec	2.4 sec
5 ppm	10	25 sec	4.8 sec
1 ppm	2	2 min	24 sec
1 x 10-7	0.2	20 min	4 min
1 x 10-8		3 1/2 h	40 min
1 x 10-9		1 day	7 h

Frequency departure delta f/f		Interval between two bit slips	
1 x 10-10		2 weeks	3 days
1 x 10-11		4 months	1 month
As long as the interface is synchronous and "jitter" and "drift" are within the standard range, **no** bit slip occurs.			

As VoIP transmissions are digital but asynchronous, every connection must incorporate a buffer to make up for minor clock deviations and larger delay fluctuations, known as jitter. The buffer size is no longer in the Âµsec range but the msec range.

5.26.1 Network Synchronization Plan

A network synchronization plan is required for the synchronization of telecommunication and data networks. The master/slave principle is generally used for network synchronization. Plesiochronous operation of systems or network elements is also possible. In digital island networks with analog environment or analog connection to other networks the network frequency does not have to be absolutely accurate. It is sufficient for all the systems interconnected in a network to operate synchronously in relation to one another. However, if networks are digitally connected, absolute accuracy is essential if the connection is to be operated in plesiochronous mode, since the bit slip rate must be limited. Networks can be operated here in pseudosynchronous mode, meaning that each has free-run accuracy of 1 x 10 exp – 11.

5.26.1.1 Clock Hierarchy Plan

The specific requirements of the network provider and the customers result in the best synchronization strategy which can, in turn, lead to certain decisions regarding the network synchronization plan.

Example

1) All systems are to be operated synchronously at the Telecom network = simple private network;
2) Private network with connection to one point and backup by GPS
3) = Larger network with large amounts of internal traffic;
4) Network with connections to various carriers and/or Telecom;
5) Network is to become a carrier network.

First, create a topological network plan. The clock hierarchy plan is derived from the network topology plan, which must contain all route information, e.g. distances, line types, transmission equipment. Then the network synchronization plan can be created.

Transmission equipment and multiplexers must be included into the network synchronization plan.

When creating a network synchronization plan the number of clock hierarchy levels is important since they must be limited for the network to remain synchronous in all operating and error situations.

5.26.2 Definition of Hierarchy Levels

The definition of hierarchy levels specifically refers to OpenScape 4000 in this case. However, it can also be used for other transmission networks (with necessary modifications). Division into levels is necessary so that a network can function with good enough quality in the event of errors.

The connections between systems are clock transparent. The number of repeaters is only limited by the jitter and drift values provided by the route and which must comply with the input requirements.

(--> Connections)

The route clocking source should be investigated or determined in the case of non-clock-transparent routes. For leased lines, this can be the master for both systems at the connection's endpoint. However, make sure that the connection always has an external clocking source. Avoid a return to clock-transparent operation during a failure without informing the network management centers involved, since this procedure results in a forbidden clock loop.

(--> Connections, AMO REFTA)

5.26.2.1 Synchronous Private Networks

(see Figure 64)

Metering begins in the local exchange (level=0) and commences at level=1 since most private networks are connected to the public switched network and receive their synchronous clock from it. All systems with a digital connection to the local exchange that they use for synchronization are assigned level = 1.

All systems which are connected to level = 1 systems that they used for synchronization are assigned to hierarchy level = 2.

All systems which are connected to level = 2 systems that they use for synchronization are in hierarchy level = 3.

All systems which are connected to level = 3 systems that they use for synchronization are in hierarchy level = 4.

This can continue up to level 4 if systems on the same level are to be interconnected. The number of levels can exceed four in systems that are simply "cascaded". The OpenScape 4000 standard clock generators allow about seven or eight levels without any loss of synchronism under the usual boundary conditions e.g. jitter, drift and phase hits. The configuration of more than five levels is not recommended, however, as propagation times in the network are excessive for connections to public switched networks.

Once all systems have been assigned to a level, the resulting number of levels must be determined: If there are more than two levels with tie trunks, networking clock generators should be used on the first level. If there are more than three levels with tie trunks, the network clock generators should be used on the first and second level. If the systems are only cascaded without tie trunks, a network

clock generator should be used from the fifth level in the first level and on the sixth level in the first and second level.

(--> Selection of clock generators)

5.26.2.2 Plesiochronous or Pseudosynchronous Private Networks

(see Figure 64)

Independent private networks which start with an internal clock master (an OpenScape 4000 system is designated as the network clock master) or private networks with their own standard clock (the OpenScape 4000 system with an external clocking source from a standard clock is designated master) are plesiochronous or pseudosynchronous with an exactness of 1 x 10 to the power of minus 11 with regard to other networks to which they are digitally connected.

(--> Special cases, SDH)

The system designated as clock master in the network or which is provided by the standard clock is referred to as level = 0. Then the same procedure used for synchronous networks is applied for the clock hierarchy levels. If the network comprises more than four systems, the master system should have a networking clock generator. This also applies to private networks synchronizing onto the public network using an SASE but change to an autonomous clocking state in the case of trunk errors (the SASE changes to hold over or free-run mode or synchronizes onto a backup clock normal).

(--> Selection of clock generators)

5.26.2.3 Limiting Level Numbers

The limit of four levels has been introduced so that double faults on the synchronization path can be sustained with no loss of synchronism. This limitation is justified by the fact that the drift must not become too great; the drift is not attenuated in the different stages, but can in fact even be increased.

There are other important (quality) criteria independent of network synchronization, which can lead to a limitation of levels.

The "round trip delay", for instance, must be taken into account without any special measures for echo suppression. Then a maximum of five levels is reasonable.

5.26.2.4 Reducing Level Numbers

It is easy to reduce the number of levels by wider networking. However, this is sometimes not possible for topological and/or economic reasons.

If necessary, the number of levels can be reduced by synchronizing the transmission equipment (the transmission network) from the system on level = 1 or = 0. In this way, all systems directly synchronized by the transmission equipment are assigned to level = 2 or = 1. Due to the fact that a connection can go from one system to a third bypassing the second, the actual route can become longer. This is only possible since the route length of the transmission can, theoretically, be up to 27,000 km according to the standards. However,

this shifts responsibility for network synchronism to the transmission system. It should also be noted that in the case of intelligent transmission networks - where automatic changeover includes synchronization - the transmission network must be included into the network synchronization plan and into network management. Therefore, the network must be treated as a separate hierarchical level as known from the OpenScape 4000 system. This treatment reduces the number of possible OpenScape 4000 levels; for the transmission equipment networking clock generators may become necessary.

(--> SDH, Special cases)

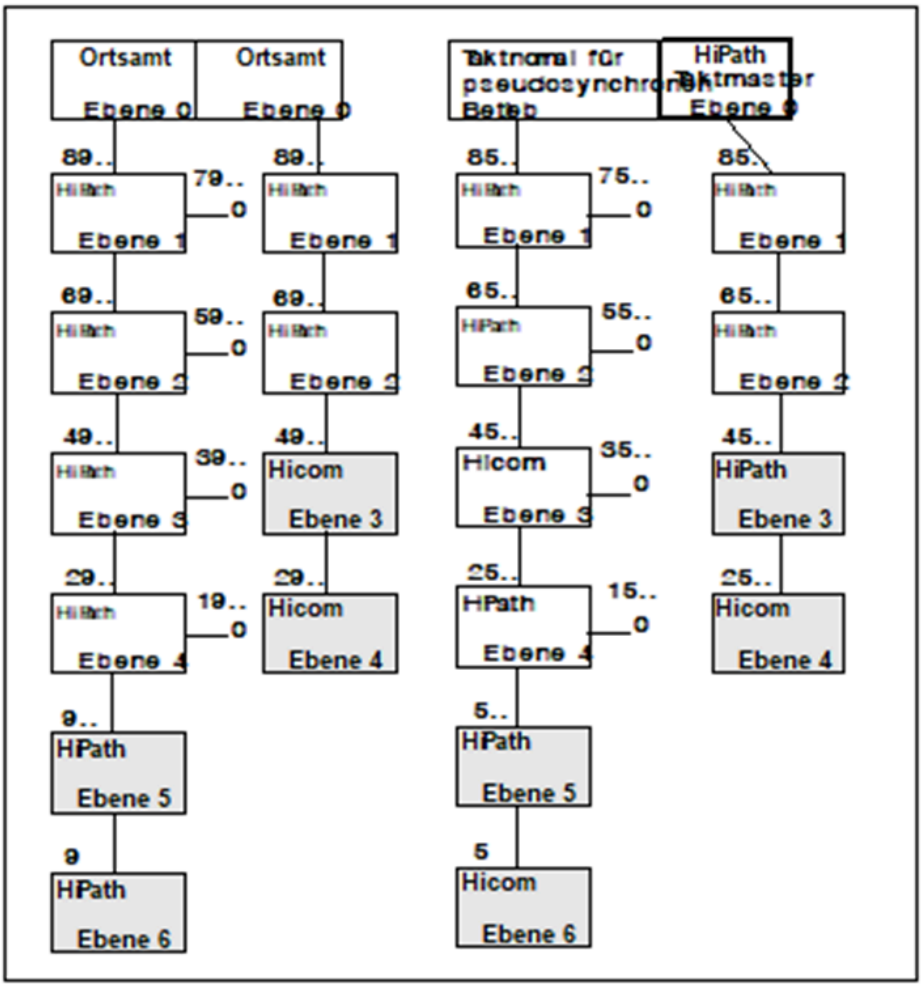


Figure 62: Hierarchy levels with OpenScape 4000/HiPath 4000 networks

Annotation 1: Networking clock generator in level **1 or 1 and 2** necessary

Annotation 2: Connecting lines _____ represent clock-transparent digital connections between the systems. Analog and VoIP connections must not be displayed as connecting lines in the clocking plan.

Annotation 3: The numbers at the connections between the systems are a suggestion for priority assignment in the reference clock table (REFTA)

5.26.3 Connections

The term "connections" refers to all digital connections between the systems, e.g. trunk connections and tie trunks, regardless of the transmission equipment. Although VoIP connections are digital, they do not transmit any clocking signals (asynchronous transmission). Time information that can later be used for synchronization (NTP, PTP) can only be transmitted with specific protocols - even over IP connections.

5.26.3.1 Synchronization Interfaces

All digital connections can be used for synchronization. The following interface types exist:

ATM: STM1 or OC3 (bit rate 155,52 Mbps);

PMA: E1 (S2M, S2M FV, PCM30) (bit rate 2,048 Mbps), T1, T1.5 Accunet (bit rate 1,544 Mbps);

BA: T0, S0, U-2B1Q (bit rate 160 Kbps) and data interfaces in accordance with ITU X.21 with bit rates between 1,200 bps and 64,000 bps.

Depending on the network topology not all interfaces on the different levels are allowed as tie trunk connections because the elastic buffers have different sizes:

Level	Admissible tie trunk connections
1	S1, T1, S2, PCM30, STM1, S0, X.21
2	S1, T1 *, S2, PCM30, STM1, S0
3	S1, T1 *, S2, PCM30, STM1
4	S1, T1 *, S2, PCM30, STM1

1) * : In the case of network connections routed exclusively via AT&T's T 1.5 Accunet service only one level with T1 tie trunk connections is allowed because the network jitter/drift may be up to 90 Âµsec high, but the T1 interface components have only +/- 125 Âµsec buffers.

In the OpenScape 4000 system, all available digital interfaces for synchronization can be set if the reference clock table size is matching. This makes it possible to deal with not only simple failures but also double and quadruple errors in a predefined manner. Always make sure that automatic changeover of reference clock routes in a network do not cause clock loops. Experience with many networks shows that leased lines used for tie trunks often cause problems because it is necessary to determine whether or not they are clocked. Also clock quality and availability of local exchange trunks is normally better than the quality and availability of leased lines.

5.26.3.2 Clock-Transparent Connections

All wire connections, repeater chains or radio relay connections with which the clock can be transmitted via the interface together with the data stream

are referred to as clock-transparent connections. Clock-transparency must be valid in both directions. PCM2 connections, for instance, are clock-transparent in one direction only. The number of repeaters is only limited by the jitter and drift values provided by the route and which must comply with the input requirements. This must always be researched and checked for leased lines. Unstructured leased lines (i.e. without frame) are normally transparent if PDH technology is used. The procedure in figure is based on the assumption that transparent connections are used for the assignment of the priority values.

5.26.3.3 Connections with External Clock

The route clocking source should be investigated or determined in the case of non-clock-transparent routes. For leased lines, this can be the master for both systems at the connection's endpoint. However, make sure that the connection always has an external clocking source. Avoid a return to clock-transparent operation during a failure without informing the network management centers involved, since this procedure results in a forbidden clock loop that goes unnoticed at first. Structured leased lines always have an external clocking source. Check the clocking source and routes to which the clock is distributed for every multiplexer in the network.

External clocking can generally be assumed when using SDH technology. The network synchronization plan is then drawn up in compliance with the switching and the transmission equipment. Check for SDH multiplexers if the interfaces are set to "retiming" and if the "retiming" is to be accepted by the OpenScape 4000 system. This function requires the connection of the SDH multiplexer's clocking port (T4) to the OpenScape 4000's front reference port using a special cable. For information on the advantages of transferring the "retiming" function to the PBX, see Section 46.5.7, "SDH".

5.26.4 AMO REFTA

The AMO REFTA is used to edit the reference clock table (REFTA). The system references this table which contains the interfaces used for synchronization with the corresponding priorities. The priorities define which interface and priority must be used for synchronization for every system. It also defines the sequence in the case of possible failures. Also the interfaces are defined which are never used or only for special error cases occurring in the network during a synchronization process.

The safety equipment processes the error counter according to a patented procedure. The error counters generally provide the network provider with important information about the layer-1 quality of the network connections. The reference clock table provides a complete overview of the synchronization state of the system. Comparing different reference clock tables with the network synchronization plan provides a quick overview of the network situation with regard to synchronization and layer-1 errors.

The points are weighted in the error counters according to their importance for the synchronization quality and increased for transmission if the errors occurred in layer 1. The error counters are reduced by 5% at hourly intervals as long as the system is synchronous. The error counters therefore always show quality differences for the interface and thus for the connected equipment and routes in relation to the last hours. Serious errors remain visible over a longer period

of time (1 to 2 days). As soon as the error counter for an interface is no longer 0, the "History error messages" file containing error messages for the relevant interfaces should be consulted. The OpenScape 4000 error messages can be used to find network errors - even in the transmission network and transmission equipment.

A bit slip, for example, is penalized with 150 points, a short interrupt < 1 sec with 1,500 points, a longer interrupt with 1,500 points x seconds, an excessive frequency departure during regulation start or an excessive jitter with 32,000 points. A record contains 16,000 points at startup. A record is not accepted - even if it has the highest priority - once the error counter exceeds 42,000 points. A record of this kind is accepted after a minimum of 30 minutes and "paroled" with error points below 42,000 if it has the highest priority.

If no records can be referenced (during tests) because of error counters, all error counters are halved.

In special cases, the barring column (= YES or = NO) provides a means of direct access for quick intervention in network synchronization. It is mainly used in rare network errors to turn the synchronization direction without the need to switch off the remaining interfaces. Setting the disable function to "YES" for a record with a certain priority has the same effect as setting the priority to 0. As priority changes from and to zero are possible by simply switching the record on and off, turning the synchronization direction in these rare network errors by switching on and off the interfaces would be unreasonable.

Clock supplier: The selected interface used for synchronization is marked "X" in the REFTA.

Only one clock supplier can be active for LTUs 1-15. As LTUs 17-99 (IPDAs) are connected asynchronously via LAN, synchronization is not possible with the system's central clock generator. Consequently, a separate IPDA can be selected in each interface and used for synchronization. This is also marked "X" in the REFTA.

IMPORTANT: If digital trunk or tie trunk circuits are operated in an access point, the AP's local clock generator must be synchronized with the network clock ("CO clock").

5.26.4.1 Value Range of Priorities

The value range for the priority is between 1 and 90, the higher value also means the higher priority. A priority of 0 prevents this interface from being used for synchronization. In the case of special errors, interfaces which may be used temporarily for synchronization must be assigned an appropriate priority and the barring must be set to YES. Thus the synchronization direction can be turned without the necessity to switch the route on and off as is the case with the change of priority =0. Before changing barring from YES to NO, make sure that it has been changed from NO to YES on the other side. This priority assignment is to prevent the fatal error of a synchronization loop with regard to all route failures.

5.26.4.2 Priority Assignment

It is advisable to start priority assignment with priority = 89 at the routes to the local exchange level (=0). To differentiate between local exchange routes and internal connections to the clock master start here with the value = 85

(see Figure 64). Interfaces of the same value must be assigned the same priority. Steps of 1 or 2 are recommended for interfaces with different values. Connections with the same priority are selected automatically according to their quality (REFTA error counter). In case of a failure the next connection is selected, but never the last one. If you want to return to a certain interface after it has been proven OK it must be assigned a priority value which is 1 higher than all others. A return to the interface is possible after a minimum of 45 minutes and if the error counter is lower than 42,000 points. Figure 1 shows the graduation of priorities as a suggestion for a network structure. The graduation of the values in the reference clock table according to the hierarchy levels simplifies the assignment of the individual REFTA printouts and therefore are processed for the Network Management Center. It is also helpful to enter the individual interface layers of the REFTA in the network synchronization plan for easier assignment.

With the same interface type priorities should be assigned in the order alternate routing, wire and radio and then, if necessary, graduated by distance and number of repeaters. Interfaces with different bit rates provide different quality. This fact should be taken into consideration when assigning priorities. The order is:

in ROW: STM1, E1, PCM30, BA (U-k0, S0, U-2B1Q), X.21;

in USA: OC3, T1, T1.5 Accunet, BA (U-2B1Q)

For the assignment of priorities for tie lines the systems of one clock hierarchy level are sorted. The system with the most paths to the higher level is designated System 1. For this system the disable function is set to YES at the tie trunk interfaces to System 2 and the system is assigned a lower priority than provided for in System 2 for this connection. The system with the lower values corresponds to the zero. This allows turning the synchronization direction for this important system in the network. For all other tie trunk connections the priority is set to 0. The procedure is the same for System 2 and all other systems.

However, all possible network errors must be considered. Particular attention should be paid to the fact that clock loops do not occur in the event of errors or automatic changes - not even in scenarios with three or four systems.

5.26.4.3 Networks with Several Masters

If a system is connected to different masters (of the same level) the quality of this system should be taken into consideration when allocating priorities. This can mean that higher priority is assigned for the exchange (system/carrier) with the most frequent or most important (data) traffic. Several masters may not always be synchronous or pseudosynchronous in relation to one another. There is, for instance, no error message reporting via the trunk that the local exchange switched to hold over mode. Up to now there is no carrier-wide network management. The effects in the private network only show as bit slips. It is helpful to mark the existing and possible plesiochronous interfaces in the network synchronization plan as such. This procedure helps quick and

precise error diagnostics if bit slip frequently occurs on these lines. In important networks or network elements these problems can only be solved using an SASE.

(--> Clock generator selection)

5.26.4.4 AMOs LWPAR & SYSPAR

The AMOs LWPAR and SYSPAR are used to set parameters effecting synchronization. The "Master" parameter, however, is not used for synchronization but for master/slave assignment for layer 2.

The "SMD" parameter, on the other hand, effects synchronization. If SMD = YES this record will never supply the reference clock, even though it has a certain priority in the REFTA and would have been selected by the safety equipment.

The "Qual" parameter switches the CRC safety for the 2 Mbps frame on. This enables monitoring of the bit error rate and allows switch-off after 10 SESs, for instance.

5.26.4.5 Clock Generator and Front Reference

The **CLOCK BOX** (see Section 46.5, "Selection of Clock Generators") and the "**front reference**" or "frontref" (external clocking source directly on the clock generator) are independent of each other and fully integrated into the security equipment.

The CLOCK BOX must be configured as **AECB** (also applies for AICB, SASE, etc.) with the AMO REFTA, i.e. the required clock generator class can be selected. The clock generator of the simple MTSCG is in standard class 38 by default. If a working AECB is connected, class 68 can be selected for the networking clock generator (like NCG-X). If a CLOCK BOX with high free-run exactness (better than 1 x 10 to the power of minus eight) over a longer period of time is used, class 78 can be set. This class always narrows the trimming range to 0,1 ppm absolute. Setting the class does not effect or require a reset of the MTSCG board. Therefore, no duplex switch is necessary. Changeover of the class during operation results in a brief switch-off of a configured (line) reference.

If a CLOCK BOX is used, the state of the clock cable to the CLOCK BOX and the status of the background reference (OCXO) are also monitored. All changes are reported to the security equipment and are available for the NMS.

The "frontref" is part of the reference clock table. Its priority can therefore be freely selected. The frontref status of a system is continuously monitored, regardless of whether it is used for synchronization. This applies for the A and B controllers independently of each other.

5.26.4.6 Changes with cPCI Control

The situation illustrated in Section 46.4.5, "Clock Generator and Front Reference" also applies to the OpenScape 4000 based on the cPCI controller with the following changes: The clock generators are now located on the RTM

modules and can be reached externally via the MCM module. Consequently, there is now only one connector for the "external clock box", which can also be used to connect the "frontref". The input clocks are distributed from here to both clock generators or the output clock originates in the active (master) clock generator. The "external clock box" interface on the MCM is mechanically and electrically identical to that of the MTSCG.

5.26.5 Selection of Clock Generators

Various different clock generators are available in different price categories. The two most important criteria when choosing a clock generator for OpenScape 4000 systems are:

1) Exactness of free-run mode
2) Performance for network operation

5.26.5.1 Exactness of Free-Run Mode

The accuracy of free-run mode in clock generators for normal ISDN PABX networks is important for systems which are to operate as the master of a digital island, i.e. for plesiochronous or pseudosynchronous private networks. As free-run accuracy does not have to be very high in the first case, the small clock generator with +/- 32 ppm is sufficient. The standard clock generator (class 38) offers +/- 10 ppm and the networking clock generator (class 68, 78: +/- 5 ppm with AICB or with an external clock box: 1 x 10 to the power of minus nine to 10 to the power of minus eleven). This accuracy is guaranteed for fifteen years under all operation conditions. Note the exact definition of free-run accuracy when comparing models.

5.26.5.2 Performance for Network Operation/Normal Clock Generators

Hierarchical levels are important when choosing clock generators because systems with multiple successive layers encounter a large amount of transit traffic. Therefore greater clock stability must be ensured to counteract the increased probability of malfunctions, see ISO standard 11 573 or ETSI or TIA standards. Clock generators for transit systems (e.g. MTSCG+RTM type + clock box in class 68 or 78), moreover, have a longer time constant than standard clock generators (e.g. MTSCG/RTM type in class 38) which in turn have a longer time constant than clock generators for smaller systems.

IPDA (HG3550) uses class-38 clock generators which can no longer have an external clock box but which can be configured with a "frontref" as of OpenScape 4000 V4 (R1). This is important in connection with Cordless and ISS (i.e. seamless handover) because the time information for ISS can also only be used in the case of precise clocking from the GPS.

For reasons of stability, the time constants in a network should be progressively shorter.

The "Networking clock generator" feature (class 68 or 78) provides a system with a more accurate frequency in free-run mode, a more stable hold over mode for a longer period of time, a longer time constant for the PI regulator, a more thorough check of the reference frequencies, faster recognition of reference

frequency changes and a trimming range smaller than with the standard clock generator (class 38). For the "Networking clock generator" feature to work, an AECB, an AICB or an SASE must be connected to the front panel of the MTSCG board or the MCM module in the cPCI controller. The clock generator can then be set to the corresponding class using the AMO REFTA. Class 38 corresponds to the standard clock generator. Classes 68 and 78 are networking clock generator classes, the class 68 corresponding to the previous NCG-X and class 78 providing a further limitation of the trimming range, thus making the system resemble an SASE, even replacing an SASE in some cases.

Table 16: Quality differences for clock generators

Values	Standard clock generator	Networking clock generator
Free-run, (delta f/f) for 15 years	10 x 10 -6	4,6 x 10 -6 .. 1 x 10 -10 1)
hold over mode (initial offset)	4 x 10 -9	2 x 10 -9
hold over mode (3 days)	1 x 10 -6	3 x 10 -9
hold over mode (10 days)	1 x 10 -6	8 x 10 -9
Time constant (I-part)	approx. 15 minutes	approx. 1 hour
Trimming range (absolute)	min. +/- 32 ppm	min. +/- 10 ppm
Trimming range for ATM	min. +/- 20 ppm	min. +/- 5 ppm
Trimming range for class 78	- -	min. +/- 0.1 ppm

1) depending on the external clock box used

5.26.5.3 Hold Over Mode

In hold over mode the clock generator remembers the frequency onto which it synchronized. In the event of a failure of all possible reference sources the clock generator can then operate with the last set frequency in synchronous mode.

The standards do not require this function for simple clock generators. In the event of failure of all reference sources, the clock generator can switch to its own average value which can be several ppm off.

A real hold over mode has been implemented for even the simplest, smallest OpenScape 4000 clock generators. With increasing quality this function works even more accurately with standard and networking clock generators. Not only the frequency at the moment of failure is considered (which can be off) but

an average value of the last 30 minutes and the last 24 hours is calculated which is then slowly passed by the system in a smooth changeover. With networking clock generators this hold over frequency is stored in a non-volatile memory to prevent its loss during power failure or change of boards. Also, the frequency accuracy during hold over mode relies especially on the temperature dependency of the quartz oscillator used. For standard clock generators, temperature compensated oscillators (TCVCXO) are used with a frequency deviation of only +/- 1 ppb over the entire temperature range. For the background reference of the networking clock generators, at least one temperature stabilized oscillator (OCXO) is used which a frequency deviation of only +/- 1 ppb over the entire temperature range.

5.26.5.4 ATM

The free-run accuracy must be considered in the case of ATM because the interface function is not higher (as is the case with PMA with +/- 50 ppm and BA with +/- 100 ppm) than the free-run accuracy standard of the clock generators with +/- 32 ppm for stratum 4 or +/- 50 ppm for ISO 11 573 class III.

The STM1 or OC3 interface has been designed for frequency deviations of +/- 15 or 20 ppm.

The OpenScape 4000 standard clock generators meet these requirements in free-run mode. The trimming range is also affected in that it is automatically limited by an ATM interface board. Synchronization on a (drifting) local exchange could be stopped with the error message "BAD CLOCK" to prevent a private ATM interface from failure.

5.26.5.5 External Clock Box (AECB, AICB, etc.) for OpenScape 4000

The MCM module on the cPCI controller features a port for an external clock box where an AICB, AECB or SASE can be connected. It should be noted that this interface corresponds mechanically and electrically to that of the MTSCG.

The external clock box must be configured as "AECB" using the AMO REFTA for inclusion in network management.

5.26.5.6 Network Clock Supply

The standard clock generator suffices for clock supply of a small private network in an analog environment. The default clock generator is sufficiently precise even for the clock requirements of cordless DECT. If better clock quality is required for the network, a networking clock generator must be installed in the master system. It already has the Stratum 3 clock quality, i.e. the quality of a USA CO, and the frequency stability and hold over function of an ITU local exchange, but not the same free-run accuracy. If free-run accuracy is important for the network or if independence from Telecom/the carriers is desired, an SASE must be installed in the master system and, in larger networks, also on the first level in front of the OpenScape 4000 clock generators. This provides clock quality of a local exchange or means Stratum 2 level.

As PDH networks are hardly ever used anymore and even SDH networks are slowly being replaced by MPLS networks and thus by VoIP technology,

the demand for networking clock generators in OpenScape 4000 systems is decreasing. Clock distribution has been shifted to the transmission network in SDH networks. Responding to these changes is simply done in OpenScape 4000 by using the external clock box less and the frontref more. It is easy to connect to each T4 output with the special cables for the cPCI or IPDA shelves. From the clock perspective, this means there is no longer an OpenScape 4000 master system in the network.61.6 SDH, Cordless - CMI (DECT) and ATM

5.26.5.7 SDH

For the combination of an OpenScape 4000 with SDH transmission equipment the following must be considered other than with PDH equipment:

Transmission within the SDH (Synchronous Digital Hierarchy) is synchronous with the SDH network clock on the levels STM - n. Data rates below 155.52 Mbps are mended but differently than with PDH (Plesiochronous Digital Hierarchy). Data streams from the SDH< 155.52 Mbps can or could be supplied with the SDH network clock. This is called "retiming". "Retiming" can be performed both in the SDH multiplexer or in the OpenScape 4000 system. For retiming in the OpenScape 4000 system, a clock connection from the SDH multiplexer (port T4) to the OpenScape 4000 front reference port must be established (special cable). The front reference is then set using the AMO REFTA and its priority adjusted correspondingly for the OpenScape 4000 system to synchronize onto this front reference. "Retiming" is then automatically executed in the OpenScape system. The advantage only exists as long as an overflow of the "retiming" buffer leads to a bit slip and not to a total loss of frame synchronization with a complete disconnection of all B channels as the SDH multiplexer has only 40 Âµsec buffer depth for retiming, while the OpenScape 4000 PMA interfaces have a buffer of +/- 125 Âµsec.

SDH equipment without "retiming" behave identically to PDH equipment in the case of 2-Mbps interfaces, i.e. the connections must be treated as clock-transparent (PDH). Priorities for the OpenScape 4000 reference clock table remain the same.

The fact that the SDH network should be operated synchronously to the Telecom/carrier clock at this point should be considered when planning the network. If an SASE (tracking oscillator) is connected, further T4 ports with 2.048 MHz for the T3 clock ports of the PABX equipment are used in addition to the clock for the front reference.

As soon as "retiming" is used, clock distribution in the network must be redesigned since the SDH network is important for clock distribution.

In case of "retiming", the SDH network must be able to receive the master clock (PTT or SASE) from two independent ports. Thus the SDH network has the same clock supply as an OpenScape 4000/HiPath 4000 network with clock-transparent (PDH) connections and minimum meshing. The clock is then distributed in the SDH with the STM-n level. Reconfigurations during interruptions etc. are automatically performed in the SDH network (comparable to the OpenScape 4000/HiPath 4000 network planning with the AMO REFTA). The 2-Mbps connections between the OpenScape 4000 systems in the network cease to be clock-transparent. All OpenScape 4000 systems connected to the SDH network are operated as clock slaves on the SDH network. OpenScape 4000 tie trunks on the same clock hierarchy level can no longer be used as substitute routes but are allocated a priority unequal zero on both sides. This

puts these ports on the OpenScape 4000 systems on one level with the direct clock paths.

Normal transmission jitter is not greater with SDH than with PDH. During reconfigurations in the network or with plesiochronous connections between various SDH islands the so-called "pointer adjustment" jitter with an amplitude of up to 5 Âµsec can appear in addition to the normal jitter. Both the OpenScape 4000 interfaces and the clock generator can handle and accept this additional jitter and drift caused by SDH.

Network synchronization and SDH equipment planning should be performed in conjunction with personnel representing the relevant transmission systems.

5.26.5.8 HiPath Cordless (CMI)

Free-run accuracy with Cordless DECT must be considered because the transmission equipment (DECT) requires an absolute accuracy of +/- 10 ppm for the entire temperature range and +/- 5 ppm for the limited temperature range. The small clock generator suffices as long as Telecom or any equivalent carrier supplies the system via digital interface. The standard clock generator should be used for "island" operation over a longer period of time. This is provided therefore for all OpenScape 4000 systems and the IPDAs.

5.26.5.9 Network-Wide Synchronization for Cordless (ISS)

The "network-wide seamless handover" function requires an exact phase relationship between the basic stations, especially in connection with data applications. The deviation of the DECT frame at the air interface must not be more than +/- 2 Âµsec between the basic stations for "seamless handover". Frequency economics also require this in-phase condition. Due to their synchronization over TDM connections, OpenScape 4000 systems are frequency- and phase-synchronous in relation to one another. However, every system has its own frame clock phase relationship because the different propagation times of the digital interfaces are compensated by frame adjustments on the receiver side. The PCM frame clock (8 kHz) of various OpenScape 4000 systems can therefore have any phase relationship of module 125 Âµsec in relation to one another and cannot be used for network-wide synchronization of the DECT basic stations. Instead, GPS receivers are used which deliver a 12-sec pulse from 1 or 2 measuring boards to the master SLMC board of each system. The pulse phase relationship must be absolutely exact with a deviation of +/- 500 ns. This exact phase time information is then evaluated and measured in relation to the system clock. The CMI basic stations receive setting information from the derived value so that they can keep their frame clock at the air interface in relation to one another with a deviation of +/- 2 Âµsec. This procedure provides the hardware for network-wide "seamless handover".

In the case of VoIP, please note that TDM connections are no longer needed to connect the systems, but that IP trunking can be used exclusively. It has been demonstrated that in the case of Cordless with ISS, direct external system clocking via the 2.048 MHz clock from the GPS receiver increases stability more than synchronization over tie trunks. It is therefore strongly recommended to always use the "frontref" supplied by the GPS receiver.

A Datum GPS receiver has been certified for ISS V1.0 for this. The GPS receiver also has a V.24 output to which a cable to a OpenScape 4000 input can be connected (thus making the OpenScape 4000 UTC compliant).

If a receiver of this kind or an SLCSM fails in 2008 or later and cannot be repaired or replaced, the relevant system will have to be upgraded to ISS V2.0. The network supports combinations of V1.0 and V2.0. When replacing a GPS receiver, the aerials must also be replaced but the aerial cable can continue to be used. When exchanging SLCSM for SLCSS, both master and standby have to be replaced. The cables can still be used.

A Meinberg GPS receiver (available from Unverdross-Technik) has been certified for ISS V2.0. The time output here is suitable for SLCSS measurement modules, the clock output is suitable for "frontref" (special cable). A suitable NTP time normal for this receiver can also be ordered so that time is supplied to the systems, servers and terminals via the LAN.

5.26.5.10 ATM Interface (STMA Board)

The STMA board provides the first ATM interface in a system. If an STMA board is configured, the security equipment narrows the trimming range of the clock generator during startup to approx. +/- 15 to 20 ppm. The clock generator ensures that any private ATM interface behind a PABX system always works. The OpenScape 4000 clock generator can therefore cancel synchronization onto the master (e.g. the local exchange) and issue the message "Trimming range exceeded" although the frequency departure is still within the ISDN standards. As with a lot of error messages from the OpenScape 4000 clock generator, the error does not lie within the OpenScape 4000 system but outside it.

Together with the ATM, many new systems currently enter the market which originated from the data world and do therefore disregard "clocking" as it is required by the ISDN/PCM world. In future there will be more and more ATM systems also suitable for the CBO. The present ATM systems must be checked to see if they can transmit clocking for a CBO or not. If the result is positive, the next question arises: whether the ATM systems have a priority list for various ports, i.e. can be regarded as an own hierarchy level like a OpenScape 4000 system. If the result is negative, connections via the ATM system must be treated like analog connections, i.e. they are not mentioned in the network synchronization plan. This must lead to appropriate conclusions since there are fewer substitute routes, for instance, for synchronization. In future, however, there will be no differences between transmissions via PDH, SDH and/or ATM.

5.26.5.11 Special Cases

For larger synchronous networks with one master system (with SASE) and peripheral systems connected to local exchanges by BA, check if the small buffer of the BA suffices for the jitter and drift of all possible networking situations. If in doubt, system synchronization from the local exchange is preferable. In this case, the connection, which in the event of error can show bit slip, drifts from the perimeter into the private network. The BA, however, remains slip-free in normal operation because the buffers of the internal PMA interfaces are sufficient in size.

5.26.5.12 Front Reference

In the case of OpenScape 4000 with a cPCI controller, the front reference can continue to be connected to the MCM module and the "external clock box" connector with the special frontref cable (S30267 – Z319 – A150). It is distributed to both clock generators on the RTM module. Configuration with the AMO REFTA remains unchanged.

The front reference in every IPDA can also be used. If the cordless coverage areas of several nodes overlap, (e.g. of several IPDAs), these nodes must be synchronized with ISS in order to avoid dropped call in the overlapping area and to enable switching nodes during a call. All base stations in a continuous coverage area of a cordless system must be synchronized according to the DECT requirements to enable a seamless handover, regardless of whether they are connected to a IP access point (AP 3300 IP, AP 3700 IP) or a host system frame (AP 3300, AP 3700). To do this the IP access points must receive synchronization signals from a GPS receiver. The AP3x00 IP IP access points with the NCUI4 control board enable the handover between base stations connected to two IP access points.

To date the ISPA requires a TDM line as a base clock and the GPS clock for advanced settings for ISS. By using the front reference, the TDM line does not need to be used as a clock supplier. The clock is now provided solely from the GPS receiver. The GPS receiver clocks once via the NCUI front reference input and SLC24 clocks via the SLCSS board.

A cluster of several IPDAs at one site can be supplied to by the clock distributor via a GPS receiver.

The GPS signal ensures the GPS receivers are synchronized and therefore also that the IPDAs or the IPDA clusters are synchronized. If an IPDA cluster has no overlapping area to a cluster clocked by another GPS receiver or separate IPDA, this cluster can operate without a GPS signal. This means that the receiver generates a dummy signal to synchronize in a cluster but does not require a GPS antenna.

The AMO REFTA can be used to configure and prioritize the frontref separately for every IPDA.

The frontref that can be used to operate OpenScape 4000 satisfies the UTI G.703 § 13 recommendation with wave resistance of 120 ohms.

Administration

```
ADD-REFTA:TYPE=FRONT,PRI=89,LTU=17;

CHANGE-REFTA:TYPE=FRONT,PRI=90,LTU=17;

DELETE-REFTA:TYPE=FRONT,LTU=17;
```

(--> Section 46.4.5, "Clock Generator and Front Reference")

5.26.5.13 S0 Interface not Permanently Active

Layer 1 of a trunk connection must be permanently active for continuous synchronization of a PBX. With OpenScape 4000 systems, interfaces to the clock master are only started after the clock generator reports sufficient

synchronism. For instance, in France the S0 interface cannot be set to permanent activity. The timers on the trunk side, on the other hand, are set for insufficient intervals for the OpenScape 4000 system to respond in order to synchronize.

There may be cases in other networks where it is necessary for interfaces to the clock master to be immediately operable although synchronism is still insufficient. Therefore the AMO REFTA was prepared to assign the parameter "Ready despite asynchronous mode" to any interface if necessary. This parameter is not set by default. If it is set for an interface, this interface enters the "Ready" mode immediately, even after an HRST, without waiting for the "Synchronous" message from the clock generator.

If OpenScape 4000 systems are networked with S0 connections, the parameter SMD must be set to "NO" (despite priority = 0) in the AMO SYSPAR. This sets the layer 1 of this BA to permanent activity. Both sides of the connection must be set to "Trunk".

5.26.5.14 Setting the REFTA Error Counter to 16 000

An interface is only selected as reference clock source if

- it is set to TMD and is Ready,
- it has the highest priority and an error counter < 42 000,
- it has the lowest error counter for the same priority level.

During integration tests, startup and switchovers for error diagnostics the error counter can quickly rise to 65 535. Since it is only reduced by 5%/h in synchronous systems, the established procedure was to remove and re-install the peripheral board. This resets the error counter to the starting value of 16 000. A REFTA command has been implemented to set the error counter to 16 000 without affecting the peripheral board or having to handle it.

5.26.5.15 T4 Clock Output/Previously T3ab, APT3 Adapter

In the past, a T4 clock output based on TU G.703 § 13 with wave resistance of 120 ohms was frequently required for clocking transmission equipment. An adapter for a shelf used to exist for this and was followed by the AECB or AICB. The demand for this clock is very rare these days. This is why it no longer exists in the OpenScape 4000 with cPCI controller.

An SASE/SSU is often required for the networking clock generator function. The SASE then provides all T4 clocks for transmission equipment and for the OpenScape 4000 front reference. This output is therefore no longer required.

5.26.6 Notes/Experience

There are many ways in which a route providing the reference clock can fail. In the simplest case it is only interrupted and the clock immediately switched off. The clock generator then switches to hold over mode. Regulation commences automatically in the case of interruptions of under 1 sec. An appropriate message is entered in the REFTA error column. If the interruption is longer than 1 sec., the security equipment is switched on. A waiting period of 1 minute is observed for the line to return and then regulation is restarted. If the interruption

is longer than 1 minute, the next line with a suitable priority and error counter is selected from the REFTA and switched on.

Error cases with uninterrupted lines and deteriorating quality are more difficult. These could be caused by a repeater that is about to fail but is still delivering its own - internal inexact - clock or by external interruptions that result in higher jitter. A certain period of time can elapse before the clock generator detects the quality deterioration or the frequency departure. The "BAD CLOCK" error message provides valuable information.

If S2 or S0 lines are to supply the reference clock, SMD must be set to "NO" in the AMO SYSPAR. This sets the interface to TMD = Trunk Mode Digital.

If OpenScape 4000 systems are networked with S0 connections, the parameter SMD must be set to "NO" (despite priority = 0) in the AMO SYSPAR. This sets the layer 1 of this BA to permanent activity. Both sides of the connection must be set to "Trunk".

ATM interfaces will require that the interface is operated as a trunk with regard to the clock, although the board only addresses subscribers.

If a system has trunk connections to various carriers (Telecom, CMI, Viag, Telalliance, ...) it is more favorable to use different DIUS2, DIUN2 or DIUT2 records (or similar) than to put all (and different) carriers onto a single board. This not only provides better availability but also better synchronization: the reference clock to the clock generator has less jitter (cross-talk on a board) because the clocks of the different carriers can be only pseudosynchronous in the best case.

5.26.7 Abbreviations

Table 17: Abbreviations

AECB	=	Atlantic External Clock Box
AICB	=	Atlantic Internal Clock Box
AMO	=	Administration & Maintenance Order
APT3	=	Adaptor Plug T3 clock output (now T4)
ATM	=	Asynchronous Transfer Mode
BALUN	=	Balancing Unit/conversion from 120 ohms symm. to 50 ohms asymm.
CBO	=	Continuous Bitstream Operation, = voice, fax, multimedia
CGM, CGMC	=	Clock Generator Module (Q9606) corresponds to SCG
CMI	=	Cordless Multicell Integration
DECT	=	Digital Enhanced Cordless Telephony
DSC80	=	Dataprocessor Stream Control 80 CMX
DSCX	=	Dataprocessor Stream Control 80 ECX

DSCXL	=	Dataprocessor Stream Control
ETSI	=	European Telecommunication Standardization Institute
GPS	=	Global Positioning System
HG3575	=	Gateway HG 3575, IPDA controller, HW = NCUI4
HRST	=	Hard Restart
HW ID	=	Hardware code in H = hexadecimal representation
IP	=	Internet Protocol
IPDA	=	IP Distributed Architecture, H4k access point
ISS	=	Inter System Synchronization, cordless seamless handover network-wide
ITU	=	International Telecommunication Union
MTSCG	=	Memory Time Switch Clock Generator (Q2224)
MCM	=	Management and Control Module
NMS	=	Network Management System
NTP	=	Network Time Protocol
OCXO	=	Oven Controlled Xtal Oscillator, i.e. temperature stabilized
PDH	=	Plesiochronous Digital Hierarchy
P I	=	Proportional Integral (regulator)
PLL	=	Phase locked loop
REFTA	=	Referenz Takt (reference clock) Priority list, AMO REFTA
RTM	=	Real Time Module, part of the cCPI controller
SASE	=	Stand-Alone Synchronization Element (ETSI)
SCG	=	Small Clock Generator (on SCC board)
SDH	=	Synchronous Digital Hierarchy
SES	=	Severely Errored Second
SLCSS	=	Subscriber Line Cordless Synchronization Support (plug-in module)
SMD	=	Subscriber Module Digital (opposite of TMD = Trunk Module D).
SSU	=	Synchronization Supply Unit (synonym for SASE9
TCVCXO	=	Temperature-Compensated Voltage Controlled Xtal Oscillator

T3	=	2.048 MHz input clock according to ITU G.703/10, previously T3-an
T4	=	2.048 MHz output clock according to ITU G.703/10, previously T3-ab
VCXO	=	Voltage-Controlled Xtal Oscillator
VoIP	=	Voice transmission over the Internet protocol
Xtal	=	am. for quartz oscillator

5.27 Restricted Call Duration for Transit Calls

The duration of a transit call can be limited.

5.27.1 Feature Description

With the feature **Restricted Call Duration for Transit Calls** it is possible to limit the duration of a transit call.

The parties in the call will be warned by Override tone shortly before the maximum call duration is reached. The call will be automatically released after the warning period.

The activation of the feature is controlled by the AMO COT parameter **CDSV** (**C**all **D**uration **S**uper**v**ision).

The call duration time and the duration of the warning period are administrable on a per trunk basis. AMO TDCSU will be enhanced to configure the call duration timer and the warning period timer.The call duration timer range is 1 to 60 minutes in minute intervals. Default value is 60 minutes.

5.27.2 Service Information

The feature **Restricted Call Duration for Transit Calls** supports ISDN and IP trunks.

5.27.3 Generation (Example)

Feature Activation with Call Duration Supervision in AMO COT

```
ADD-COT:COTNO=<cot number>,PAR=CDSV;
```

Call duration timer and warning period timer

```
ADD-TDCSU:OPT=NEW,...,CALLTIM=<call duration timer in
minutes>,WARNTIM=<warning period timer in seconds>,...;
```

NOTICE: The default values for **CALLTIM** and **WARNTIM** is 60.

5.27.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COT	CDSV	d	Überwachung der Gesprächsdauer für kommende Transitverbindungen
	CDSV	e	Call duration supervision for incoming transit connections
TDCSU	CALLTIM	d	Timer für die Zeitdauer des Rufes (in Minuten) Default: 60 0: Verbindungsdauer auf 0 Minuten begrenzt. Die Transitverbindung wird sofort ausgelöst.
	CALLTIM	e	Call duration timer (in minutes) Default: 60 0: The call duration time is set to 0 minutes. The transit call is released immediately.
	WARNTIM	d	Timer für die Warnungsdauer Bereich: 0 bis 60 Sekunden Default: 60 0: Sofortiges auslösen sobald der Timer für die Zeitdauer des Rufes abgelaufen ist (ohne Aufschalteton).
	WARNTIM	e	Warning period timer Range: 0 to 60 seconds. Default: 0 0: Immediate release when the call duration timer expires.(without override tone).

5.28 Route Optimization

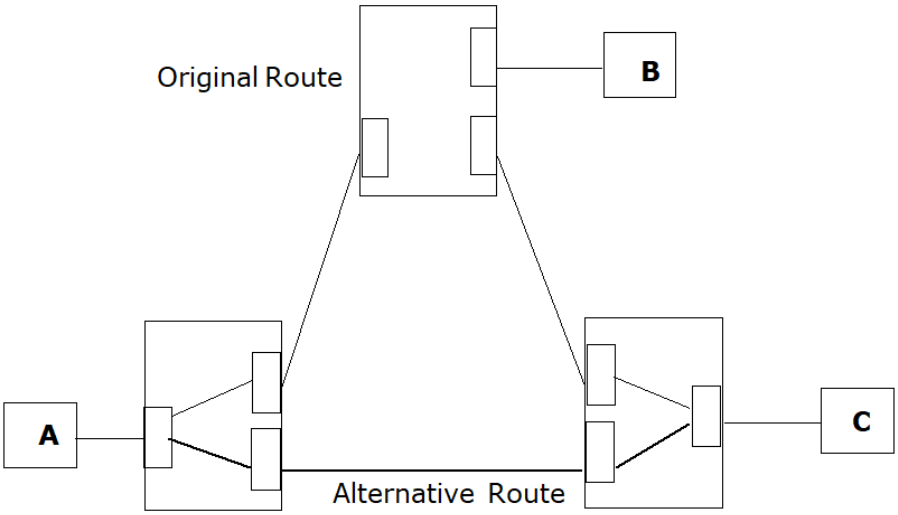
5.28.1 Feature Description

The purpose of this function is to prevent the unnecessary use of alternative routes and the unnecessary seizure of lines. To this end, a "more favorable" alternative path is hunted as a replacement for the standard route which has been selected for a particular call processing situation; the system performs changeover to this new route.

This feature applies to the voice service for both open and closed numbering schemes in homogeneous OpenScape 4000 networks. The generic name for this QSIG feature is Path Replacement as detailed in protocol specifications ISO 13874, ECMA-176 and ETSI 300-259.

It is recommended to use TDCSU protocol either ECMAV2 or PSS1V2, however the feature is also working with CORNV33 and ECMA1.

The devices can be analogue or digital phones, or analogue or digital trunks.



Route Optimization starts when:

The Route optimization process starts, when two stations after a transfer enter normal two party talking state i.e.:

1) after a call transfer or pickup from a consultation call that is in talking state
2) after a call transfer from an attendant to a consultation call that is in talking state
3) after a transfer from consulted ringing or busy state after the connection of the requested station
4) after attendant transfer from consulted ringing or busy state after connection of the requested station
5) when a three-party conference is reduced to a two-party call

---

IMPORTANT: The station user cannot influence the Route Optimization function.

Route Optimization does NOT start when:

The Route optimization process does not start if:

1) one of the stations A or C is an:

- Attendant
- VMS/VMX
- S0PP Functional Device (ISDN or SIP). UFIP SIP stations however are supported.

2) If stations A and B are in the same Node
3) If stations B and C are in the same Node
4) If station B received two incoming calls and transfers them together
5) If the call is not a Voice call e.g. Data Call
6) Route Optimization is not executed for consultation calls (i.e. it makes no sense, because another transfer is expected).

7) Route Optimization is not executed when the second subunit of the phone is busy e.g. second call. The reason is that no features are allowed during Route Optimization execution e.g. AUN, Toggle etc.

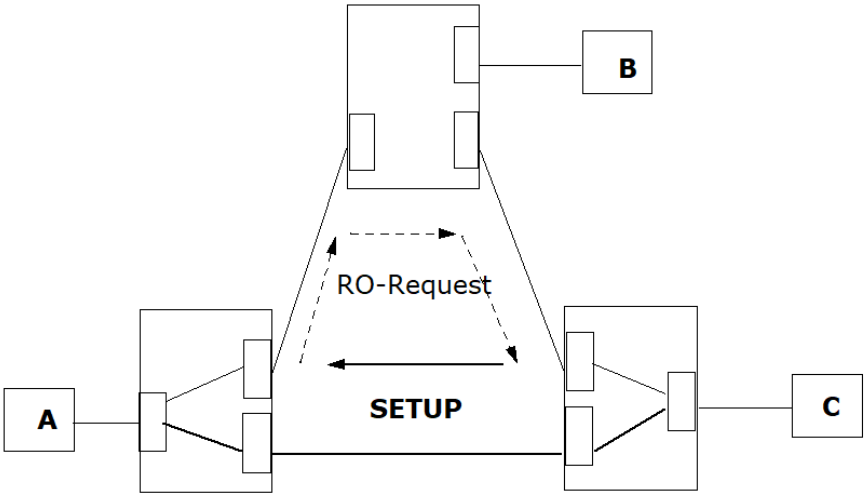
8) Route Optimization is not supported for Reroute Internal.

Route optimization Message Flow:

- The Route Optimization is initiated from the Node where the held station resides in the form of a route optimization Request (PRPropose). Before sending the request it is checked if the Route Optimization feature is disabled centrally:
  `AMO ZAND:ROUTOPTD:YES`
- Then in every node for every route it will be checked if the Route Optimization is permitted to the next partner:
  `AMO COT:ROPT`
- The search for a new route can also be administered by:

  AMO ZAND ROUTOPTP=YES (Route Optimization Only Primary Route), or if set to NO all routes can be used for alternate routing. There will be no overflow to Central Office because the signalling required for route optimization is not supported.
- With the setup to a new route it will also be checked if the route supports Route optimization which is done through:

  AMO RICHT ROUTOPT=YES, this check is in addition to the AMO COT parameter ROPT.



When using number modification, the Physical Node Number from AMO ZAND is used for modification.

To prevent call interruption by the switching to the new connection, during the route optimization phase both paths will be switched (broadcasting).

5.28.2 Special Notes

The connection does not restart safe once the Setup of the alternate route has been started i.e. once the Setup Message has been sent from Node C, only first

once the original connection has been switched to the alternative route will the connection be "saved" again. In Node C this will be with the incoming Connect message over the alternate route and in Node A with the Disconnect of the original connection.

During the optimizations message flow the stations A and C cannot invoke any features e.g. Consultation etc. With analogue stations the try will simply be ignored and with digital the display "Please Repeat" or "Not Possible" will be seen in the display.

Path Switching

OS4K will only execute Route Optimization when A receives primary end. If C receives primary end, A will reject the PRPropose and initiate its own reinvite afterwards.

Route Optimization in Hicom/HiPath uses B.1.2 Separate Switchover of Each Direction of Transmission. For further information please see the protocol specification ETSI 300-258/ISO 13863.

B.1.2. Separate Switchover of each direction of transmission.

With this approach, FE2 transmits on the new user information channel as soon as it has been agreed with the next CC, whilst continuing to transmit and receive on the old user information channel for transmission and reception but also continues to transmit on the old user information channel. On receipt of the PRS response/confirmation, FE2 switches over to the new user information channel. On receipt of the PRS response/confirmation, FE2 switches over to the new user information channel for reception as well as transmission. Effectively the two directions of transmission are switched over at different times, and any disruption in user information due to signalling delays is eliminated.

Party A in switch A will switch to the new connection upon receipt of the Route Optimization Setup.

Party C in switch C will switch to the new connection when the Route Optimization Call Proc is received.

Switch A will only disconnect the old path upon receipt of the Disconnect message received for the old connection.

Some problems have been reported related to loss of syllables/speech at the beginning of the Route Optimization calls when systems are connected via IP Trunking. This error happens due to delays in IP networks and that H323 only switches the Payload first with the Route Optimization Connect message (as per protocol because no Alert is sent). The delay can be up to one second dependant on the quality of the IP network and the number of IP Hops.

The "A" side is also designated upon the time to transfer by receiving a Facility message containing ISOCallTransferComplete with endDesignation Primary End. The "C" side of the connection receives the same message, but with the EndDesignation Secondary End.

Once the Secondary End (destination of the transfer) has reached talk state, either by callStatus answered in the ISOCallTransferComplete for a transfer talking, or with a CTActive message for answer after a transfer ringing will the Primary End then send a new Facility message with ISOPathReplacePropose to initiate the Path Replacement.

5.28.3 Restrictions

- Route Optimization only works when the end partners of the standard route are analog/digital stations, analog/digital CO trunk circuits or Native SIP trunks. Analog interface circuits, S0PP functional devices, special equipment (VMX, VMS, paging, etc.), special configuration (e.g. SSTN in AMO SCSU) and COs (as A or C stations in consultation) are not supported.
- Route Optimization is not executed for consultation calls (i.e. because another transfer is expected) or when the second subunit of the phone is busy (e.g. second call).
- Route Optimization cannot be initiated by a transit OpenScape 4000 node in the standard route (only end to end route optimization is possible).
- An option for to repeat Route Optimization feature requests from a timer not provided e.g. in case of insufficient resources, after a collision or when busy etc. Where route optimization is not performed due to this reason, the standard route is maintained.

5.28.4 Service Information

Administration Rules

1) Setting the home physical node number:

An network-wide unambiguous physical node number must be set in each network node by means of the AMO ZAND, parameter PNNO. (The node number of the virtual node is configured in the AMO KNDEF.)

2) Setting the home physical node code:

The Route Optimization feature is based on the physical node codes. These must be unambiguous throughout the network. This also applies to networks with closed numbering schemes.

The home physical node codes must be assigned by means of AMO ZAND, parameter PNODECD, and applied to digit analysis result OWNNODE by means of the AMO WABE. (The node code of the virtual node is configured in the AMO KNDEF.)

IMPORTANT: If route optimization is performed, the node code contained in the route optimization messages is subject to the station number modification which must be correctly configured.

---

3) Configuring routes to remote network nodes:

The remote node codes must be configured by means of AMO WABE (DAR "TIE") for both open and closed numbering schemes and assigned to the trunk groups as route codes with AMO RICHT.

IMPORTANT: Note that in spite of the closed numbering scheme the node codes for route optimization must have open numbering.

---

4) Identification of routes suitable for route optimization:

The routes must be marked as being suitable for route optimization by means of AMO RICHT, parameter ROUTOPT=Y. The lines of all routes with

ROUTOPT=Y must lead to nodes which also support route optimization (see 5). This cross reference is not verified in the AMOs!
Identification of lines leading to adjoining nodes that support route optimization:

A class of trunk must be defined by means of AMO COT, parameter PAR=ROPT. This class of trunk must be assigned, by means of the AMO TDCSU, to those circuits which lead to an adjoining node that support route optimization. This ensures that the standard route and the alternative route only pass via nodes that support route optimization.

5) Setting protocol variant:

The AMO TDSCU, parameter **PROTVAR** should be used in variant Hicom 300 V3.3 or higher to set the value **CORNV33** (or the value **ECMA2** in Hicom 300 V3.5 or higher) in all digital tie trunk circuits to nodes to ensure transmission of the ROPT-specific messages in the network protocol.

Cross checks: AMO RICHT checks whether a route to be set up with ROPT capability contains at least one trunk group of the type S0/S2 and whether the "voice" service has been configured.

IMPORTANT: Standards and alternative routes do not restart-safe during the optimization process. In addition, all station services are disabled for the duration of the optimization process. An attempt to activate features in this phase is acknowledged on the display with "PLEASE REPEAT" or "NOT POSSIBLE". Attempts to activate a feature are ignored in the case of analog stations.

5.28.5 Generation (Example)

5.28.5.1 Heterogeneous Network

The heterogeneous network consists of a total of four closed-number nodes (that is, an area) with a node that does not support route optimization (1-89-400).

Route a: Standard route after call transfer Route b: Alternative route after call transfer

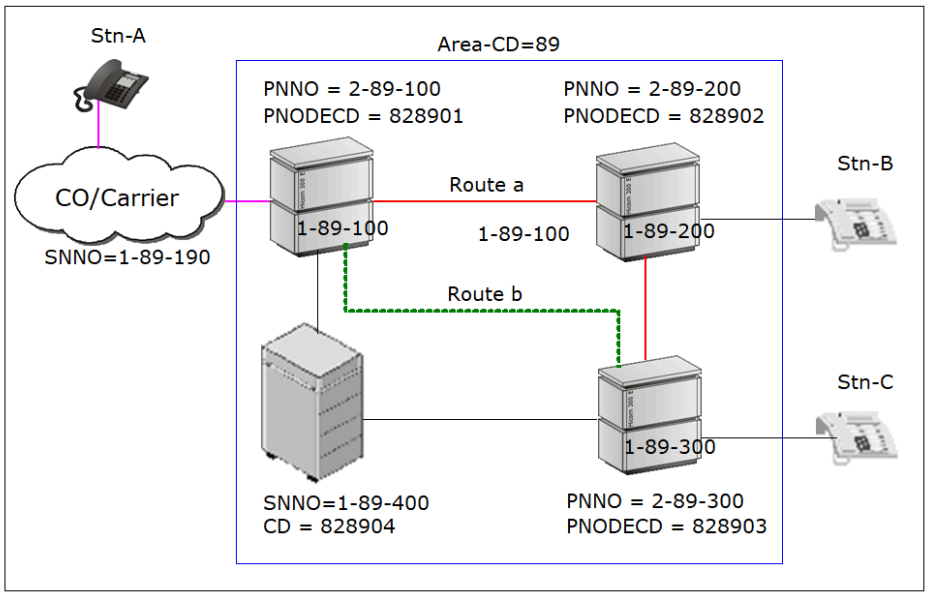


Figure 63: Heterogeneous network with Route Optimization

Subscriber A in the public exchange calls user B in the ROPT-compliant network. The later makes a consultation call to user C and transfers the call to C.

If the prerequisites for route optimization are satisfied (that is, route permitted for route optimization and circuit with parameter ROPT), the standard route (route a) is switched to the alternative route (route b) at the moment of call transfer.

To ensure smooth switchover of the call, so-called "broadcasting" is performed in the transition phases: the "old" and "new" circuits receive the user's call data at the same time.

IMPORTANT: Only commands important for the Route Optimization feature are listed. Information on adding boards, trunk groups and CO accesses is not shown here because no ROPT-specific settings are necessary. Only the ROPT-specific parameters should be specified as a change in the AMO TDCSU.

Commands for PNNO 2-89-100:

- Assign a home physical node code and area code in the AMO WABE as follows:
  `ADD-WABE:CD=828901&89,DAR=OWNNODE;`
- Assign remote node codes on the TIE DAR in the AMO WABE as follows:
  `ADD-WABE:CD=828902&828903,DAR=TIE;`
- Set a home physical node number and node code for route optimization as follows:
  `CHA-ZAND:TYPE=ALLDATA,PNNO=2-89-100,PNODECD=828901;`
- Only configure first path for route optimization, (ROUTOPTP=NO is default):
  `CHANGE-ZAND:TYPE=ALLDATA,ROUTOPTP=YES;`
- Allow a route optimization request for all physical nodes:
  `CHANGE-ZAND:TYPE=ALLDATA,ROUTOPTD=NO;`

- Define class of trunk for lines to adjoining nodes with route optimization capability:
  ```
  ADD-COT:COTNO=0,PAR=ROPT;
  ```
- Define class of trunk for line:
  ```
  ADD-COT:COTNO=20,PAR=LWNC;
  ```
- You can define the class of trunk for the line to the CO without the COT parameter ROPT.
- Assign circuits to adjoining nodes with route optimization capability as follows:

  ```
  CHANGE-
  TDCSU:PEN=1-2-25-0,COTNO=0,PROTVAR=ECMA2,SEGMENT=8,DEV=S2CONN;
  ```

  Assign circuit to node (without **NODENO** transmission):

  ```
  CHANGE-TDCSU:PEN=1-2-25-1,COTNO=20,PROTVAR=CORNV33,
  SEGMENT=1,DEV=S2CONN,SNNO=1-89-400;
  ```
- Assign LCR routes for route optimization with closed numbering as follows:

  From physical node 2-89-100 to physical node 2-89-200:

  ```
  ADD-RICHT:MODE=LRTENEW,LRTE=902,NAME="ROUTEOPT",
  TGRP=20,DNNO=1-89-200,ROUTOPT=YES,INFO="ROUTEOPT TO
   200",
  PDNNO=2-89-200;
  ```

  Define an outdial rule with the AMO LODR:

  ```
  ADD-LODR:ODR=1,CMD=ECHO,FIELD=1;

  ADD-LODR:ODR=1,CMD=END;

  ADD-LODR:ODR=1,INFO="CLOSED NUMBERING ROPT";
  ```

  Define a routing element with the AMO LDAT:
  ```
  ADD-LDAT:LROUTE=902,LVAL=1,TGRP=20,ODR=1,LAUTH=1;
  ```

  Add a digit pattern with the AMO LDPLN:
  ```
  ADD-LDPLN:LDP=828902-T,LROUTE=902,LAUTH=1;
  ```
- From physical node 2-89-100 to physical node 2-89-300:

  ```
  ADD-RICHT:MODE=LRTENEW,LRTE=903,NAME="ROUTEOPT",
  TGRP=30,DNNO=1-89-300,ROUTOPT=YES,INFO="ROUTEOPT TO
   300",
  PDNNO=2-89-300;
  ```

  Define an outdial rule with the AMO LODR:
  ```
  ADD-LODR:ODR=1,CMD=ECHO,FIELD=1;

  ADD-LODR:ODR=1,CMD=END;

  ADD-LODR:ODR=1,INFO="CLOSED NUMBERING ROPT";
  ```

  Define a routing element with the AMO LDAT:
  ```
  ADD-LDAT:LROUTE=903,LVAL=1,TGRP=30,ODR=1,LAUTH=1;
  ```
- Add a digit pattern with the AMO LDPLN:
  ```
  ADD-LDPLN:LDP=828903-T,LROUTE=903,LAUTH=1;
  ```

- Assign routes for closed numbering, **ROUTOPT=NO** is default:

```
ADD-RICHT:MODE=CD,LRTE=400,CD=40,CPS=0,SVC=ALL,
NAME="TO NODE 400  ",TGRP1=40,DESTNO=40,DNNO=1-89-400,
ROUTOPT=NO,PDNNO=1-89-400;
```

Commands for PNNO 2-89-200:

- Assign own node code and area code in the AMO WABE:
  `ADD-WABE:CD=828902&89,DAR=OWNNODE;`
- Assign remote node codes in DPLN (DAR TIE):
  `ADD-WABE:CD=828901&828903,DAR=TIE;`
- Assign user B locally in dial plan:
  `ADD-WABE:CD=7200,DAR=STN,DESTNO=0;`
- Set a home physical node number and node code for route optimization as follows:
  `CHA-ZAND:TYPE=ALLDATA,PNNO=2-89-200,PNODECD=828902;`
- Only configure first path for route optimization, (ROUTOPTP=NO is default):
  `CHANGE-ZAND:TYPE=ALLDATA,ROUTOPTP=YES;`
- Allow a route optimization request for all physical nodes:
  `CHANGE-ZAND:TYPE=ALLDATA,ROUTOPTD=NO;`
- Define class of trunk for lines to adjoining nodes with ROPT capability:
  `ADD-COT:COTNO=0,PAR=ROPT;`
- Assign circuits to adjoining nodes with ROPT capability as follows:

```
CHANGE-TDCSU:PEN=1-2-79-0,COTNO=0,PROTVAR=ECMA2,

SEGMENT=8,DEV=S2CONN;
```

- Assign LCR routes for route optimization with closed numbering as follows:

  From physical node 2-89-200 to physical node 2-89-100:

```
ADD-RICHT:MODE=LRTENEW,LRTE=901,NAME="ROUTEOPT",
TGRP=10,DNNO=1-89-100,ROUTOPT=YES,INFO="ROUTEOPT TO
 100",
PDNNO=2-89-100;
```

  Define an outdial rule with the AMO LODR:

```
ADD-LODR:ODR=1,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=1,CMD=END;

ADD-LODR:ODR=1,INFO="CLOSED NUMBERING ROPT";
```

  Define a routing element with the AMO LDAT:
  `ADD-LDAT:LROUTE=901,LVAL=1,TGRP=10,ODR=1,LAUTH=1;`

  Add a digit pattern with the AMO LDPLN:
  `ADD-LDPLN:LDP=828901-T,LROUTE=901,LAUTH=1;`

  From physical node 2-89-200 to physical node 2-89-300:

```
ADD-RICHT:MODE=LRTENEW,LRTE=903,NAME="ROUTEOPT",
TGRP=30,DNNO=1-89-300,ROUTOPT=YES,INFO="ROUTEOPT TO
 300",
PDNNO=2-89-300;
```

  Define an outdial rule with the AMO LODR:
  `ADD-LODR:ODR=1,CMD=ECHO,FIELD=1;`

```
ADD-LODR:ODR=1,CMD=END;

ADD-LODR:ODR=1,INFO="CLOSED NUMBERING ROPT";
```

Define a routing element with the AMO LDAT:
`ADD-LDAT:LROUTE=903,LVAL=1,TGRP=30,ODR=1,LAUTH=1;`

Add a digit pattern with the AMO LDPLN:
`ADD-LDPLN:LDP=828903-T,LROUTE=903,LAUTH=1;`

Commands for PNNO 2-89-300:

- Assign own node code and area code in the AMO WABE:
  `ADD-WABE:CD=828903&89,DAR=OWNNODE;`
- Assign remote node codes in DPLN (DAR TIE):
  `ADD-WABE:CD=828901&828902,DAR=TIE;`
- Assign user C locally in dial plan:
  `ADD-WABE:CD=7300,DAR=STN,DESTNO=0;`
- Set a home physical node number and node code for route optimization as follows:
  `CHA-ZAND:TYPE=ALLDATA,PNNO=2-89-300,PNODECD=828903;`
- Only configure first path for route optimization, (ROUTOPTP=NO is default):
  `CHANGE-ZAND:TYPE=ALLDATA,ROUTOPTP=YES;`
- Allow a route optimization request for all physical nodes:
  `CHANGE-ZAND:TYPE=ALLDATA,ROUTOPTD=NO;`
- Define class of trunk for lines to adjoining nodes with ROPT capability:
  `ADD-COT:COTNO=0,PAR=ROPT;`
- Assign circuits to adjoining nodes with ROPT capability as follows:

```
CHANGE-TDCSU:PEN=1-2-79-0,COTNO=0,PROTVAR=ECMA2,

SEGMENT=8,DEV=S2CONN;
```

- Assign LCR routes for route optimization with closed numbering as follows:

  From node 300 to node 100:

  From physical node 2-89-300 to physical node 2-89-100:

```
ADD-RICHT:MODE=LRTENEW,LRTE=901,NAME="ROUTEOPT",
TGRP=10,DNNO=1-89-100,ROUTOPT=YES,INFO="ROUTEOPT TO
 100",
PDNNO=2-89-100;
```

  Define an outdial rule with the AMO LODR:

```
ADD-LODR:ODR=1,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=1,CMD=END;

ADD-LODR:ODR=1,INFO="CLOSED NUMBERING ROPT";
```

  Define a routing element with the AMO LDAT:
  `ADD-LDAT:LROUTE=901,LVAL=1,TGRP=10,ODR=1,LAUTH=1;`

  Add a digit pattern with the AMO LDPLN:
  `ADD-LDPLN:LDP=828901-T,LROUTE=901,LAUTH=1;`

  From physical node 2-89-300 to physical node 2-89-200:

```
ADD-RICHT:MODE=LRTENEW,LRTE=902,NAME="ROUTEOPT",
```

```
TGRP=10,DNNO=1-89-200,ROUTOPT=YES,INFO="ROUTEOPT TO
 200",
PDNNO=2-89-200;
```

Define an outdial rule with the AMO LODR:

```
ADD-LODR:ODR=1,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=1,CMD=END;

ADD-LODR:ODR=1,INFO="CLOSED NUMBERING ROPT";
```

Define a routing element with the AMO LDAT:

```
ADD-LDAT:LROUTE=902,LVAL=1,TGRP=20,ODR=1,LAUTH=1;
```

Add a digit pattern with the AMO LDPLN:

```
ADD-LDPLN:LDP=828902-T,LROUTE=902,LAUTH=1;
```

- Assign a route for closed numbering, **ROUTOPT=NO** is default:

```
ADD-RICHT:MODE=CD,LRTE=400,CD=40,CPS=0,SVC=ALL,
NAME="TO NODE 400  ",TGRP1=40,DESTNO=40,DNNO=1-89-400,
ROUTOPT=NO,PDNNO=1-89-400;
```

IMPORTANT: Since the Hicom 300 V3.2 node does not recognize route optimization, it is not specifically configured for this function. All lines to this node must be marked as non-ROPT-capable (AMO COT, AMO TDCSU and AMO RICHT) to ensure that no attempt is made to send ROPT-specific messages to the node.

5.28.5.2 Network with Several Areas

The network consists of three areas with area codes 69, 89, 79. Each area contains three physical nodes which all support route optimization.

Within an area, routes must be configured between all nodes (see Section 48.5, "Generation (Example)").

Routes must also be configured from all nodes in an area to all remote areas and the parameter ROUTOPT=Y must be set so that the Route Optimization feature works everywhere. It is not necessary to assign routes to the individual nodes in a remote area.

Example:

- From physical node 2-89-200 to physical node 2-69-100:

```
ADD-RICHT:MODE=LRTENEW,LRTE=969,NAME="AREA 69",TGRP=100,
DNNO=1-69-100,ROUTOPT=YES,INFO="TO AREA 69 with ROPT",
PDNNO=2-69-100;
```

Define an outdial rule with the AMO LODR:

```
ADD-LODR:ODR=100,CMD=ECHO,FIELD=2;

ADD-LODR:ODR=100,CMD=END;
```

```
ADD-LODR:ODR=100,INFO="AREA NUMBERING ROPT";
```

Define a routing element with the AMO LDAT:

```
ADD-LDAT:LROUTE=969,LVAL=1,TGRP=100,ODR=100,LAUTH=1;
```

Add a digit pattern with the AMO LDPLN:

```
ADD-LDPLN:LDP=69-X,LROUTE=969,LAUTH=1;
```

The route optimization request message on the standard route is modified by the node of subscriber A by means of the node connecting matrix. In compliance with KNMAT (see Chapter 41, "Number Modification"), the code for the home AREA (here 89) is added so that the node code for route optimization is now 89828901.

In the node of user C the connection setup request for the alternative route is sent to call number 89828901. A route code is only assigned for area 89; no route code 828901 is configured. If the message is received in the entry node in area 89 (in this case node with node code 828902), node code 828901 is known there. The home area code 89 is removed (in LCR using an outdial rule, not provided) and the route to 828901 is seized.

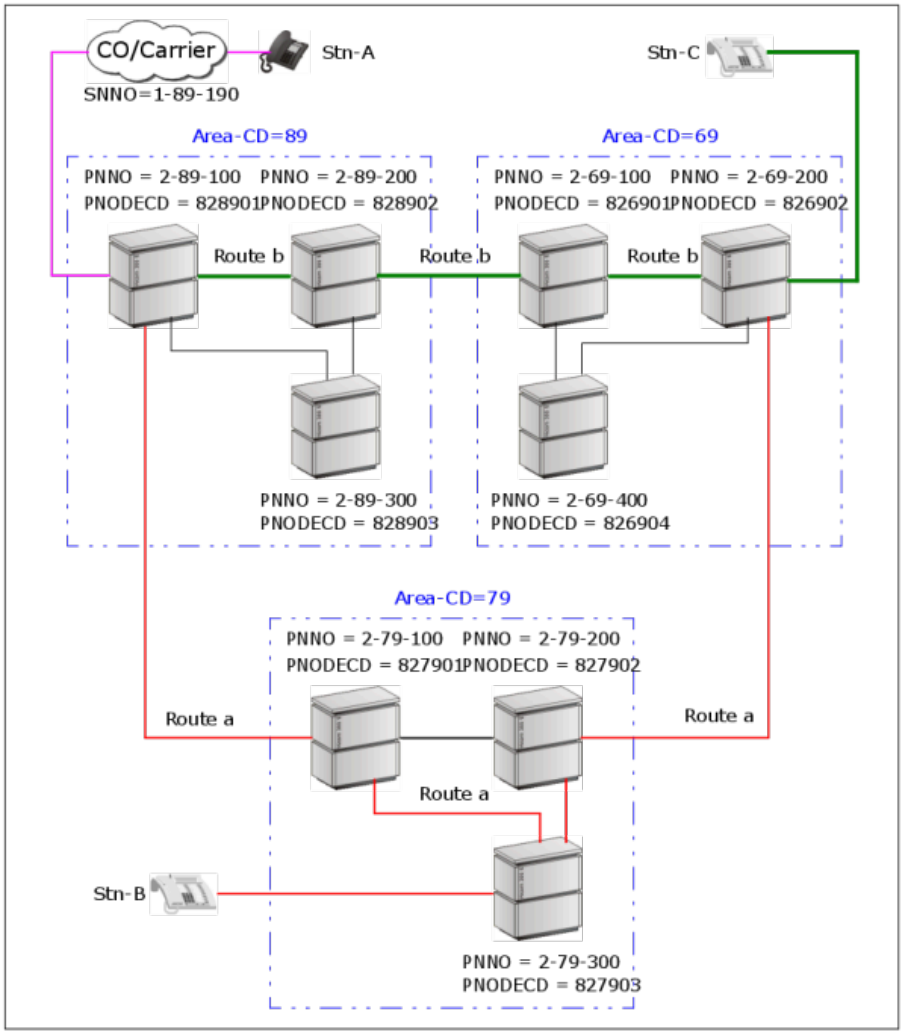


Figure 64: Network with several areas

5.28.6 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COT	COTNU	d	Class of Trunk (Nummer)
	COTNO	e	Class of Trunk
	COTPAR	d	Parameterwerte für eine Class of Trunk
	PAR	e	Parameter values of a Class of Trunk
LDPLN	LWM	d	LCR Wählmuster
	LDP	e	LCR digit pattern
	LBER	d	LCR Berechtigung
	LAUTH	e	LCR authorisation level
	LRTG	d	LCR Richtungsnummer
	LROUTE	e	LCR Route number
RICHT	ART	d	Art der Adressierung der Richtung
	MODE	e	Address-mode of the route
	LRTG	d	LCR - Richtungsnummer
	LRTE	e	LCR - Route number
	KZ	d	Richtungskennzahl
	CD	e	Routing code
	DIENST	d	Dienst
	SVC	e	Communication service
	BUNU1	d	Buendelgruppe 1
	TGRP1	e	Trunk group number 1
	ROUTOPT	d	Routoptimisation möglich
	ROUTOPT	e	route optimisation possible
	WABE	d	Wahlbewertungsgruppe
	DPLN	e	feature access group
	VKS	d	Verkehrssituation
	CPS	e	call progress state
	ZLNR	d	Zielanlagennummer

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	DESTNO	e	destination number
	ZKNNR	d	Zielknotennummer
	DNNO	e	destination node number
	PZKNNR	d	phys. Zielknotennummer
	PDNNO	e	phys. destination node number
TDCSU	LAGE	d	Anschlußlage
	PEN	e	
	PROTVAR	d	Protokollvariante
	PROTVAR	e	protocol variant
	SEGMENT	d	Segmentierung
	SEGMENT	e	segmentation
WABE	RNR	d	Verzweigungsparameter
	CD	e	access code / station number
	KZP	d	Kennzahlpunkt
	DAR	e	Digit analysis result
	WABE	d	Wabegruppe
	DPLN	e	feature access group / dial plan
ZAND	TYP	d	Auswahl des Datentyps
	TYPE	e	Desired system option
	PKNNR	d	physikalische Knotennummer
	PNNO	e	Node number (until 3 levels) for unambiguous identifaction in network.
	PKNOTKZ	d	physikalische Knotenkennzahl
	PNODECD	e	Physical node code
	ROUTOPTE	d	Route Optimierung nur unter Verwendung des Erstweges erlaubt
	ROUTOPTP	e	Route optimization only be used of primary route

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	ROUTOPTS	d	Route Optimierung sperren. Wirkt dahingehend, daß von diesem Knoten keine Wegeoptimierung-Anforderung gestellt wird.
	ROUTOPTD	e	Route optimization disable. No RO-request will be send of this node.

(AMOs for LCR can be found in the Chapter 36, "LCR (Least Cost Routing)")

5.29 S0/S2 Trunk Parameterization

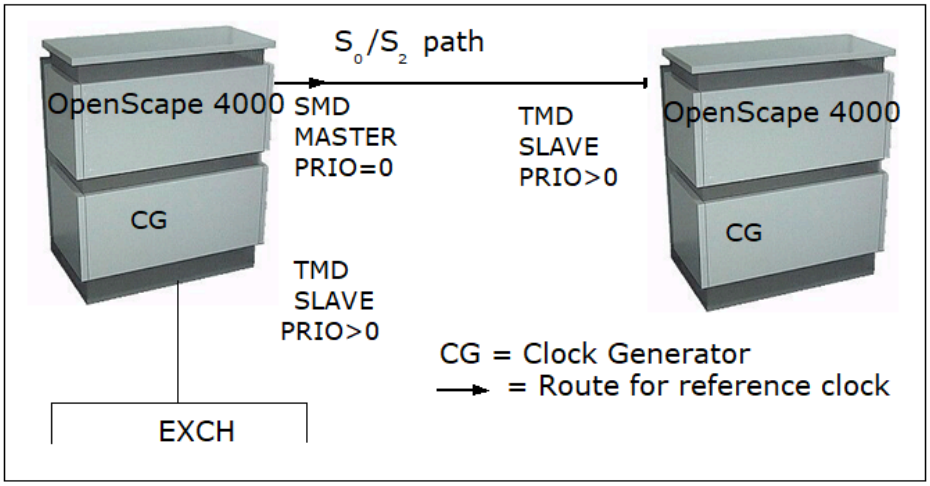


Figure 65: Example of parameterization for reference clock supply

IMPORTANT: The MASTER/SLAVE allocation is for layer 2 signalling (D-channel), has nothing to do with the clock distribution and can also be set in the reverse direction.

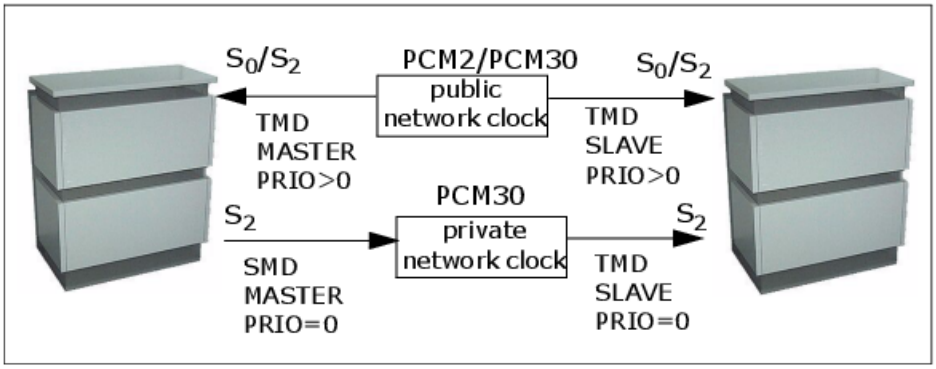


Figure 66: Example of parameterization for range extension

Three sets of associated parameters must be observed for parametrization for the reference clock supply:

SMD - TMD

MASTER - SLAVE (NETWORK-SIDE - USER-SIDE)

PRI 0 - PRI > 0

The following rules must be adhered to (Figure 67)

- Exchange trunks (S0/S2) are always
  - TMD
  - SLAVE
  - PRI > 0
- The following applies to tie trunks
  - SMD should have priority=0, MASTER should normally apply.
  - Normally, TMD has priority > 0, and SLAVE is set.
  - Normally, the three parameters have the opposite values in the remote system.
  - if SMD is set, the circuit will not be regarded as reference clock supplier even if priority = 0. Exception (see Figure 68): if PCM2/30 lines are installed for range extension, the OpenScape 4000 circuits are marked as TMD. AMOs concerned

Generation (Example)

- Exchange trunks - S0
  ```
  AD-TDCSU:OPT=NEW,COTNO=number,PROTVAR=param,DEV=S0COD;
  ```
  The parameters SLAVE and TMD are set by the AMO. They do not appear in the user interface.
- Exchange trunks - S2
  ```
  CHA-LWPAR:TYPE=DIUS2,BLNO=number,MASTER=N(Standard),
  SMD=N(Standard);

  AD-TDCSU:OPT=NEW,COTNO=number,PROTVAR=number,DEV=S2COD,
  TGRP=number, BCGR=0,LWPAR=number;
  ```
- Tie trunks - S0
  ```
  AD-TDCSU:OPT=NEW,COTNO=number,PROTVAR=param,DEV=S0CONN,
  MASTER=Y,SMD=Y;

  AD-REFTA:PEN=ltg-ltu-slot-cct,PRI=0;
  ```
- Tie trunks - S2
  ```
  CHA-
  LWPAR:TYPE=DIUS2,BLNO=number,MASTER=N(Standard),SMD=N(Standard);

  AD-TDCSU:OPT=NEW,COTNO=number,PROTVAR=number,DEV=S2CONN,
  TGRP=number, BCGR=0,LWPAR=number;
  ```
- Priority setting
  ```
  AD-REFTA:PEN=x,PRI=nn;
  ```

5.30 Satellite Paths Limiting

With this feature, it is possible to limit the number of satellite paths involved in a connection. The feature was introduced in order to ensure speech quality through adherence to the runtime requirements. The SATELLITE COUNTER introduced for this feature counts the number of satellite paths passed through. In those nodes in which a trunk group to a satellite is to be seized (in the o/g direction) a check is carried out to establish whether the threshold value has already been reached for this connection. The currently active counter, referred to in the connection setup message, is compared with the threshold value for the o/g trunk group. The connection is cleared down and an advisory issued if the counter reading, incremented by one, is higher than the threshold value; in all other cases the incremented counter reading is indicated in the message.

NOTICE: Unlike the TRANSIT COUNTER check, the SATELLITE COUNTER check is performed on the o/g side before the path is seized.

The following AMOs affect this feature:

AMO COT:	Parameter	PAR=SATV: COT with check of the number of satellite paths passed through.
		PAR=/SATV (default): no SATELLITE COUNTER check.
AMO PRODE:	Parameter	PVCD: Copying the country-specific protocol tables to the database. The CORNV33 protocol must be supported.
AMO TDCSU:	Parameter	PROTVAR: Assigning the CORNV33 protocol to the digital tie trunk circuit.
	Parameter	COTNO: Assigning the COT with SATELLITE COUNTER check to the digital tie trunk circuit. The COT must first be defined by means of AMO COT (with Parameter SATCOUNT COTPAR=SATV). Not until then is the parameter SATCOUNT analyzed.
	Parameter	SATCOUNT=NONE: No satellite connection permitted.
		SATCOUNT=NONE: One satellite connection permitted
		SATCOUNT=TWO: Two satellite connections permitted
		SATCOUNT=MANY (default): Any number of satellite connections permitted.

Configuration of satellite path limitation

The normal configuration is no limitation. The restriction can be activated with the aid of the following commands:

- Define COT for SATELLITE COUNTER check
  `AD-COT:COTNO=10,PAR=SATC;`
- Load country-specific protocol for Germany
  `COPY-PRODE:TYPE=PVCD,PVCDNR=1;`
- Parameterize digital circuit so that two satellite paths are admissible
  `AD-TDCSU:OPT=NEW,....,COTNO=10,PROTVAR=CORNV33,SATCOUNT=TWO;`

5.31 Screening on the EDSS1 Trunk Interface

5.31.1 Feature Description

The Screening function checks E.164 numbers (calling party number or connected party number) according to a predefined pattern. AMO SCREN defines the screening pattern. In case of a wrong or missing number, a default number is transmitted to the network, if required. Screening modifies only the calling and the called numbers (display) and not the dialed station numbers. Screening can be assigned to any node using the NPI (numbering plan identifier) E.164. If used as a trunk interface in a Carrier network, the OpenScape 4000 must carried out the screening procedure, as is required of an EWSD trunk interface.

The network depicted in Figure 69, which contains a OpenScape 4000 and an ISDN PBX, shows the relation between the network side (N) and the user side (U) for DSS1 and trunk interface networking.

The interface from the OpenScape 4000 (in the example: node 1-1-100) to another PBX (in the example: node 1-1-400) serves as a gateway either to an individual PBX or to an "external" network.

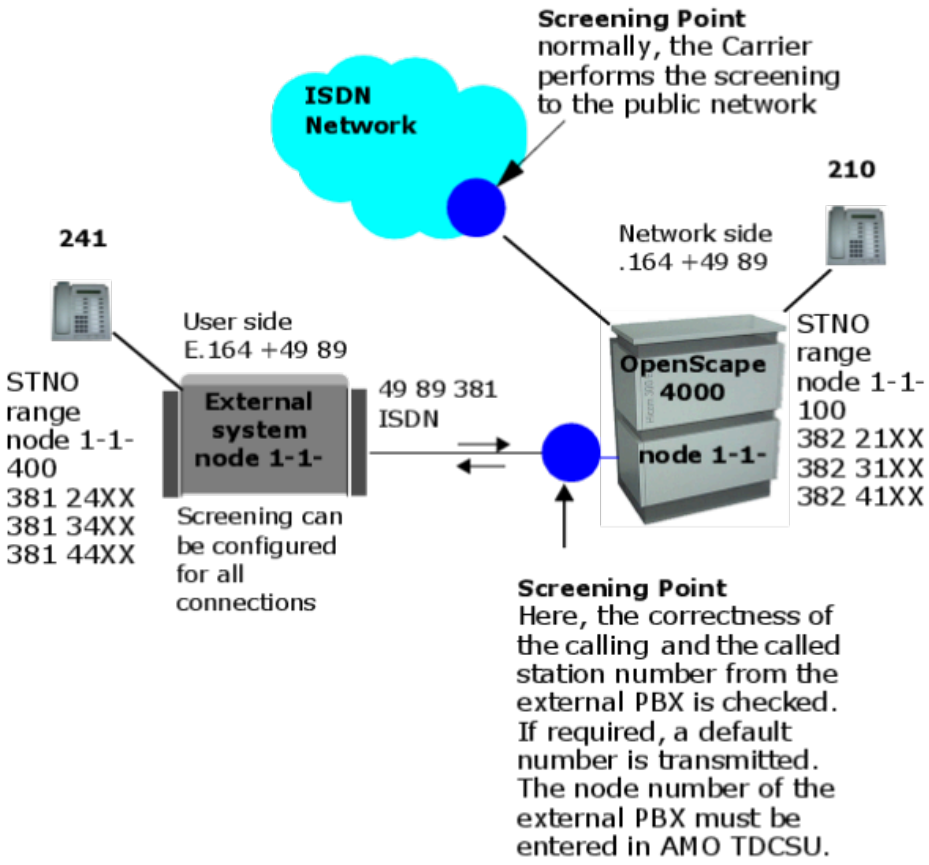


Figure 67: Network with DSS-1 protocol and E.164 numbering plan

5.31.2 Overview

	Screening			Clip/Clir	Presentation
function	checks E.164 numbers according to a predefined pattern (screening pattern)			Setting of the station number display at the called party.	Define settings to external nodes.
	Allocate memory	Specify pattern	Configure the user and network side		
used AMOS	DIMSU	SCREN	TDSCU	SCREN	KNFOR

	Screening			Clip/Clir	Presentation
procedure	configure DSS1SCRD and DSS1SCRP	configure SCRPATT and SCRDATA		Specify parameters PRESCAL and PRESCOL	

5.31.3 Screening

5.31.3.1 Allocate memory

```
ADD-DIMSU:TYPE=NETWORK,DSS1SCRD=10,DSS1SCRP=10;
```

Parameter	Function
DSS1SCRD	Quantity of screening data. This number corresponds to the number of used nodes where screening is performed.
DSS1SCRP	Quantity of the screening patterns This number corresponds to the number of E.164 numbers checked during the number screening.

The number of entries for DSS1SCRD and DSS1SCRP must exactly meet the requirements of the memory management.

5.31.3.2 Configure screening patterns

The AMO SCREN consists of the two elements SCRPATT and SCRDATA. It is recommended, to configure SCRPATT first and then SCRDATA.

Define screening pattern Typ of Number (TON) International

```
ADD-SCREN:TYPE=SCRPATT,SCRPPLAN=1,SCRP=498938124xx#
&498938134xx#&498938144xx#;
```

This numbering pattern meets the LCR rules with character strings following the digits. Every E.164 numbering pattern is allocated to a group (SCRPPLAN).

The number of screening patterns is defined in the chapter "Allocate memory" using AMO DIMSU.

The screening pattern must correspond to the TON (Type of Number) of the SCRPTYP parameter in AMO SCREN, described in chapter Configure screening patterns. This TON should not be set to unknown as this could result in ambiguous numbering.

In the example three patterns are defined. Each screening pattern corresponds to an E.164 number with TON=INTERNAT. The sequence 'xx#' indicates that two digits are to follow.

All these patterns are allocated to the SCRPPLAN number 1.

If the remote side transmitts TON INTERNATIONAL further screening patterns and data must be configured for these TON.

Configure screening data

```
ADD-
SCREN:TYPE=SCRDATA,SNNO=1-1-400,DNO=893814402,DNOTON=NATIONAL,
TOSCAL=SCREEN,PRESCAL=CLIRDEF,TOSCOL=SCREEN,PRESCOL=COLRDEF,SCRPP
SCRPTON=INTERNAT,LOCDEST=381;
```

The following data for screening is stored in SCRDATA:

- the operator number,
- which numbers are to be screened and how,
- the assigned numbering pattern and
- the original local destination code (LOCDEST).

The PRESCAL and PRESCOL data is available for the CLIP/CLIR COLP/COLR services.

SCRDATA is used to define the following parameters:

Parameter	Function
SNNO	The screening is linked with this node number. All incoming connections on this node are assigned to the screening. Originating node=1-1-400
DNO	Number for a certain station which can be reached internally or externally (e.g. operator, service personnel, users, etc.) if the screening delivered a negative result. The numbering format must correspond to the DNOTON. The screening indicator (SI) of the DNO is programmed to Network provided. (See also chapter Presentation, parameter SCRE). The DNO (e.g. 13814402) is used with activated screening, if the parameters TOSCAL and TOSCOL are set to: • SCREEN and the screening delivered negative results. • SPECARR and the numbers to be screened do not correspond to the E.164 notation. With the SPECARR function, the DNO can be transmitted as second number (e.g. operator, service personnel, etc.).
DNOTON	defines the numbering format of the DNO. Note that TON=unknown could result in ambiguity as unknown can either be a partial number (e.g. 4402), a national number (e.g. 013814402) or an international number (e.g. 004113814402) with prefix. In the example TON = NATIONAL and the DNO=13814402.

Parameter	Function
TOSCAL	defines, whether or not (and how) the A number (Calling Party Number in Setup) is to be screened. NOSCR: screening is not executed. The Calling Party Number and the second number are saved unmodified. SCREEN: the Calling Party Number is checked and the second number is deleted. If the number lies within the predefined pattern, it is accepted and marked as checked (user verified and passed). The number is then saved in the format TON using the SCRPTON parameter. If this parameter is set to TON=unknown the number is modified to subscriber. In the example SCREEN is set. SPECARR: Special arrangement checks only the E.164 format and the length for the Calling Party Number. If the result is negative the DNO is used and the second number is deleted. If the result is positive the DNO is stored as second number.
PRESCAL	Display type of the Calling Party Number (A channel station number) (For secret numbers see also Override Category in AMO KNFOR parameter OVRDCAT.) CLIPPERM: CLIP is set to permanent. The Calling Party Number is always marked with "presentation allowed" (Presentation Indicator), provided a number is available. CLIPSTD: a Calling Party Number can be secret for one called party. Normally, the number is transmitted with "presentation allowed". In special cases it is transmitted with "presentation restricted". (The setting CLIPSTD also means CLIR per call or CLIR temporary mode.) CLIRPERM: CLIR is set to permanent. The Calling Party Number is always marked with "presentation restricted", provided a number is available. CLIRSTD: a Calling Party Number cannot be secret for a called party. normally, the number is transmitted with "presentation restricted". In special cases it is transmitted with "presentation allowed". (The setting CLIPSTD also means CLIP per call or CLIP temporary mode.)

Parameter	Function
TOSCOL	defines whether or not (and how) the B number (connected number in the connection) is to be screened. NOSCR: screening is not performed. The Connected Number and the second number are saved unmodified. SCREEN: the Connected Number is checked and the second number is deleted. If the number lies within the predefined pattern, it is accepted and marked as checked (user verified and passed). The number is then saved in the format TON using the SCRPTON parameter. If this parameter is set to TON=unknown the number is modified to subscriber. In the example SCREEN is set. SPECARR: Special arrangement checks only the E.164 format and the length for the Connected Number. If the result is negative, the DNO is used and the second number deleted. If the result is positive, the DNO is stored as second number.
PRESCOL	Display type of the Connected Number (B channel station number) (For secret numbers see also Override Category in AMO KNFOR parameter OVRDCAT.) CLIPPERM: CLIP is set to permanent. The Connected Number is always marked with "presentation allowed" (Presentation Indicator), provided a number is available. CLIPSTD: a Connected Number can be secret for one called party. Normally, the number is transmitted with "presentation allowed". In special cases it is transmitted with "presentation restricted". (The setting CLIPSTD also means CLIR per call or CLIR temporary mode.) CLIRPERM: CLIR is set to permanent. The Connected Number is always marked with "presentation restricted", provided a number is available. CLIRSTD: a Connected Number cannot be secret for a called party. normally, the number is transmitted with "presentation restricted". In special cases it is transmitted with "presentation allowed". (The setting CLIPSTD also means CLIP per call or CLIP temporary mode.)

Parameter	Function
SCRPPLAN	The Screening Plan defines the numbering patterns used to check the Calling Party Number or the Connected Number. All used Screening plans must be of the same SCRPTON.
SCRPTON	The Screening Pattern Type defines the TON (Type of Number) of the SCRPPLAN. The number with TON=unknown can be ambiguous as unknown can either be a partial number (e.g.. 4402), a national number (e.g. 013814402) or an international number (e.g. 004113814402) with prefix.
LOCDEST	The Originating Local Destination Code defines the digit sequence used to supplement a partial number (e.g. a speed dialing number) to a subscriber number. The LOCDEST corresponds to the local area code assigned to the partner node. LOCDEST can also be the local area code of the own node.

5.31.4 CLIP/CLIR, COLP/COLR

These functions are implemented using AMO SCREN parameters PRESCAL and PRESCOL.

Presentation Indicator for the A side (Calling Party Number)	Calling line identification			
	Default = CLIR		Default = CLIP	
	CLIR permanent	CLIP per call	CLIR per call	CLIP permanent
allowed	restricted	allowed	allowed	allowed
restricted	restricted	restricted	restricted	allowed
No. not avail.[14]	No. not avail.	No. not avail.	No. not avail.	No. not avail.

The table also applies for Connected Line Identification but with COLR and COLP.

5.31.5 Presentation

```
ADD-KNFOR:1-1-400,ISDN,NATIONAL,USERNSCR,SEND2,SEND1,YES;
```

AMO KNFOR is used to perform certain settings to external node.

When configuring KNFOR make sure that

[14] The unused number is saved on the network side, SI = Network provided, PI = default

- NPI=ISDN
- the protocol for this connection is set to EDSS1NET or EDSBRD.

Parameter	Function
NPI=ISDN	DSS1 ISDN exchange numbering plan according to ETSI-E.164
TON	defines the modification of a number to fit a certain format before it is transmitted to a destination node. INTERPRE international station number with prefix NATIOPRE national station number with prefix ISDNCC country code ISDNIP international prefix ISDNLC local destination code ISDNNP national prefix The relevant prefixes and codes are set using AMO TDCSU.
SCRE	the Screening Indicator (SI) of a station number can be defined by its settings. Example: the station numbers transmitted from the home node (user) to the external node (net) must have the SI=USERNSCR NETWPROV: sets the Screening Indicator of the station number to Network provided. The station number is not checked for validity. (Network provided means that the station number is generated by the network and is therefore valid). TRANSP: the Screening Indicator is transparently transmitted to the external node, e.g. with transit calls. USERNSCR: the network does not check the station number. The number is also not partially checked according E.164 in case of Special Arrangement. USERVF: the station number check by the network delivered a negative result. The Network provided Nummer (DNO) was missing. (Configure a DNO, see Configure screening patterns.) USERVP: the station number check by the network delivered a positive result.

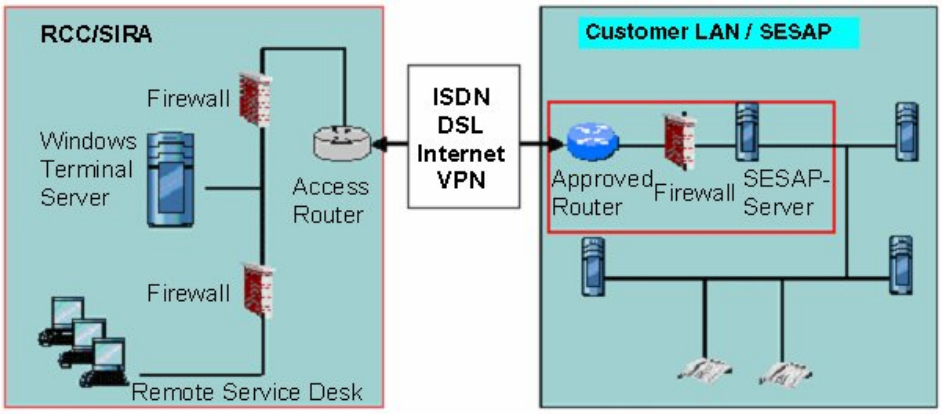
Parameter	Function
SENDCALL	SEND0: no station number is transmitted to the external node. The Information Element (IE) is deleted from the DSS-1 message and no numbers are transmitted to the external node. The Subaddress information is not transmitted. SEND1: if a station number exists, only the first number is transmitted. SEND2: if two station numbers exist the second number is transmitted if SI=Network provided. Otherwise, the second number is deleted.
SENDCONN	SEND0: no station number is transmitted to the external node. The Information Element (IE) is deleted from the DSS-1 message and no numbers are transmitted to the external node. The Subaddress information is not transmitted. SEND1: if a station number exists, only the first number is transmitted. SEND2: is not possible.
OVRDCAT	The override category is used to transmit secret numbers to an external node. YES: the secret number (Presentation Indicator (PI) = restricted) is transmitted and can be read in the external node. NO: the first and/or second number (PI,SI,TON und Digits) is completely deleted if it is a secret number (PI=rescricted or PI=Number not available). The empty Information Element, however, is transmitted in the DSS-1 message. If a secret number is deleted, the subaddress is also deleted.

5.32 Single Point of Access (SPoA)

5.32.1 Description of the product

5.32.1.1 SPoA

The SPoA concept offers, in accordance with the customer the remote access to the customer netpoints (OpenScape 4000, applications). The access is realized via a ISDN respectively a DSL connection between the RCC and the SPoA router (Huawei and Cisco) on customer side.



5.32.1.2 Option SESAP

The **S**ecured **E**nterprise **S**ervice and **A**dministration **P**latform (SESAP) is a Service Platform and supports the Remote Service engineer to carry out administration and Maintenance of Enterprise cutomers solutions in the area of IP voice and Data communications. The service platform consists of a HW platform as well as a SW suite combined with service and administration applications/tools

The SESAP SW-Suite contains Applications for

- An optimized installation and administration of IP terminals
- SW-Update and SW-distribution to IP-terminals and other applications
- IP-Network Analysis and IP Traffic measurement
- The recording and management of QoS-Data from IP-terminals and IP-Gateways
- License Management Components for Licencing of OpenScape 4000 Products

The SESAP SW-Suite is provided on a separate server and provides exclusive access for service to the customer's solutions for both local and remote access. The remote access is via a central network access (SPoA-Solution).

5.32.1.3 SIRA

Secured **I**nfratsurcture for **R**emote **A**ccess (SIRA) is the solution for the central maintenance and administration of the entire Communications product range. SIRA supports the new end-to-end service process and integrates the existing Remote Service Platform system for OpenScape 4000 switches and applications. SIRA enables the Com service to offer its customers fast remote fault clearance for all products with the help of RCC (Remote Clearing Center) or BLS (Back Level Support). Both the service organizations and the customers profit from central, globally uniform maintenance and administration for all customer systems, the travel time and costs saved through remote access, and from so-called SpoAs (Single Points of Access) to key accounts running their own local networks.

5.32.2 SPoA Router

Possible SPoA- Scenarios for the Remote-connection with SIRA in the RCC:

1) Central own customer Partner-Access:

This is used when a central Internet-VPN access from the customer or other SPoA access with NAT-functionality exists,

2) Own SPoA:

Own SPoA-Router with OpenScape 4000: When no SPoA exists in a customer network, the SPoA must be ordered as an extra. In this case the Huawei AR 18-35 Router respectively Cisco 836 is released and delivered. For IM countries who have no ISDN availability, an analog capable router can be used in the future (approximately 03.06).

5.32.3 Possible SPoA scenarios and network access on customer site

5.32.3.1 Remote Connectivity via Customer own SPoA (ISDN / DSL and VPN)

IMPORTANT: The service provides for the customer the required IP information for the configuration of the own router. Therefore a check list has to be used.

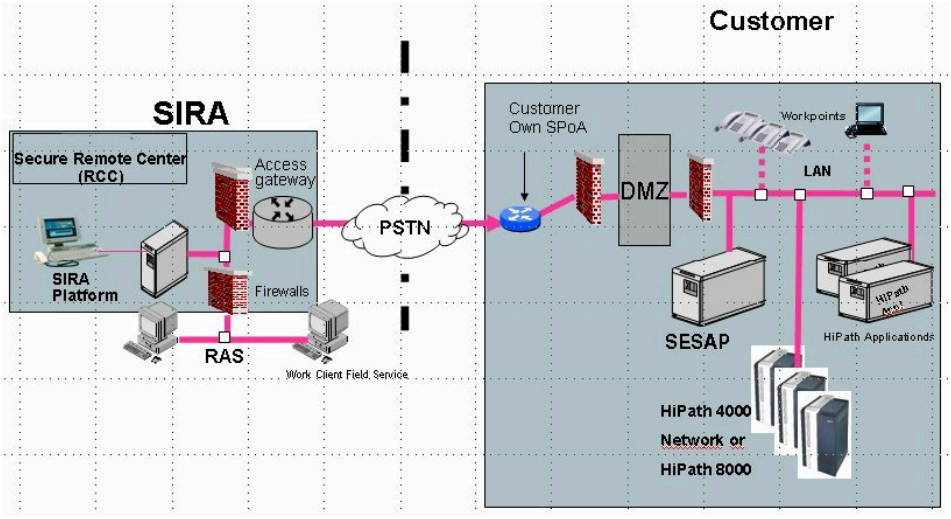


Figure 68: Remote connectivity via customer own SPoA (ISDN and VPN)

5.32.3.2 Remote Connectivity via supported SPoA Router

5.32.3.2.1 SPoA Router in the Customer LAN

IMPORTANT: Therefore the check list for commissioning through the company-own service has to be used.

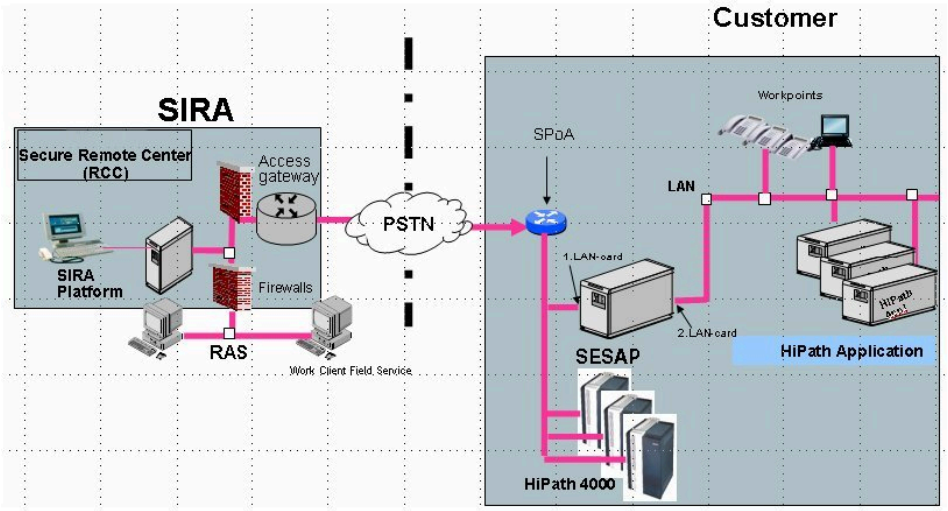


Figure 69: SPoA router in teh customer LAN

5.32.3.2.2 Direct Access SPoA Router with netpoints

IMPORTANT: Therefore the check list for commissioning through the company-own service has to be used.

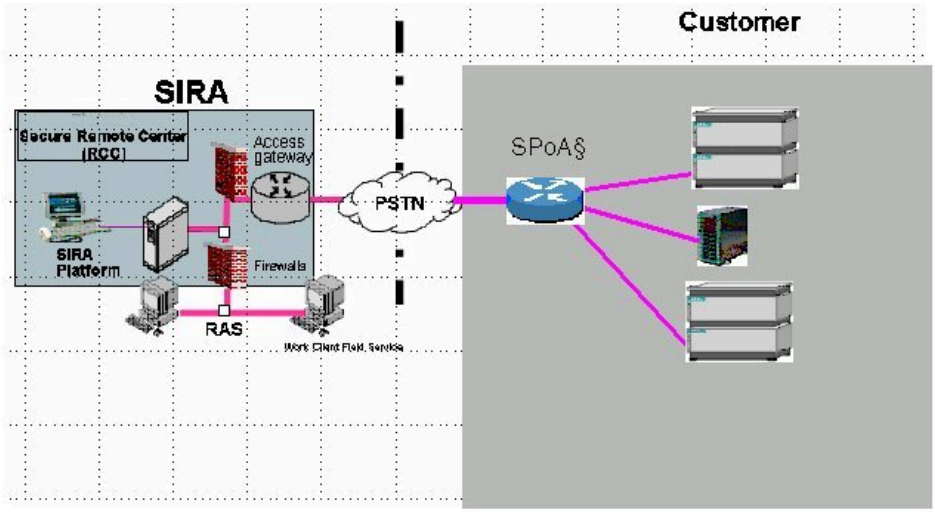
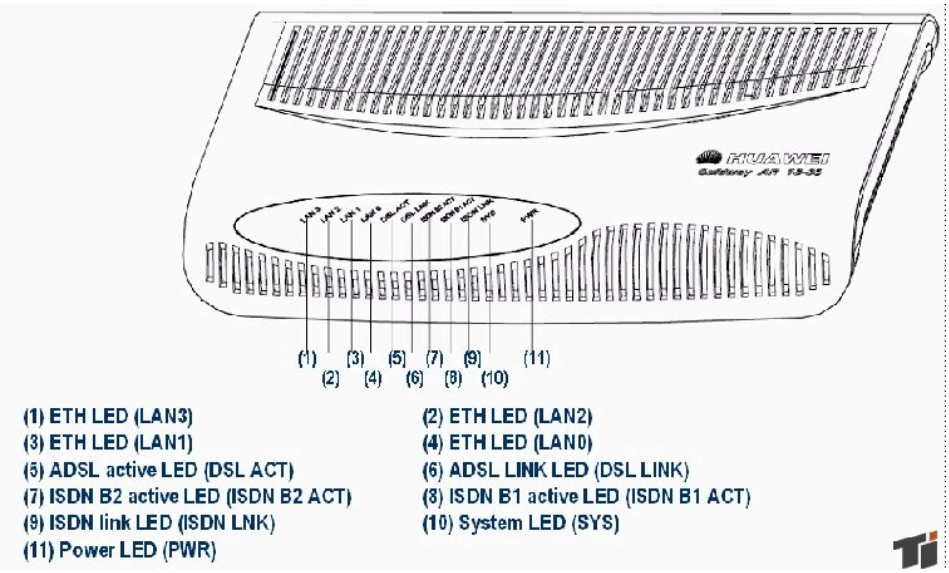


Figure 70: SPoA router with netpoints

5.32.4 Configuration of the Huawei - Routers

The router will be configured from the service personnel at the customer (remote not possible).

5.32.4.1 Display and Connectors



15

Figure 71: Front of the Huawei router

5.32.4.2 Configuration

1) Connect the Router (connector: COM) with the COM1 Port on the PC
2) Establish a connection to the ISDN (connector: ISDN BRI) and if neccessary connect DSL connection (connector: ADSL over ISDN).
3) Call up the Router Configuration tool program **SPoAConfig.exe**

15

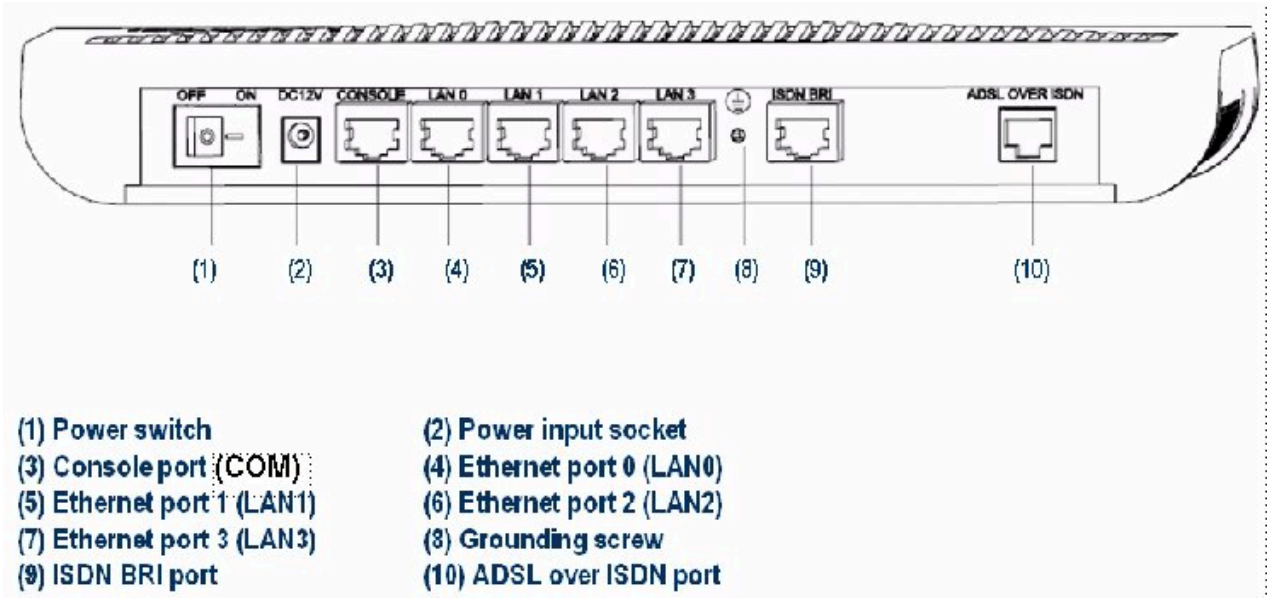
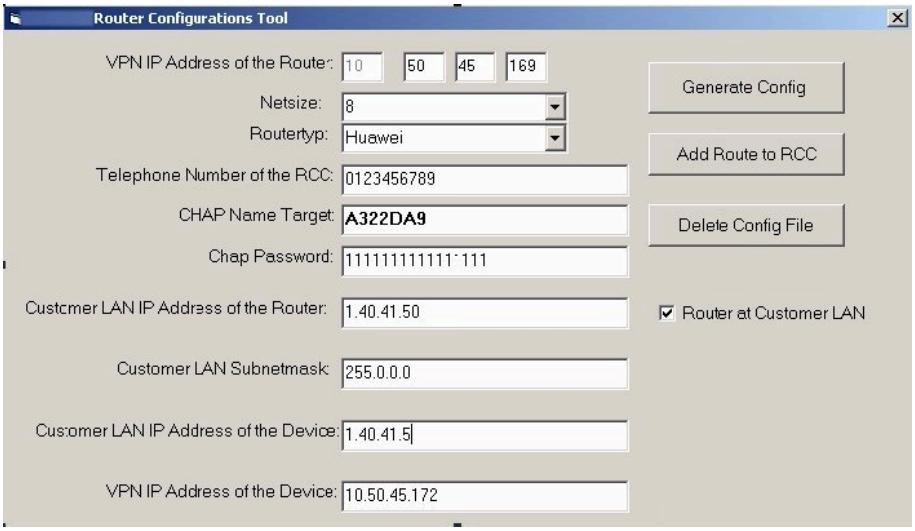


Figure 72: Back of the Huawei router

4) Enter configuration parameters

a) Configuration parameters for the SPoA connection including the first device for scenario Section 52.3.2.1, "SPoA Router in the Customer LAN":

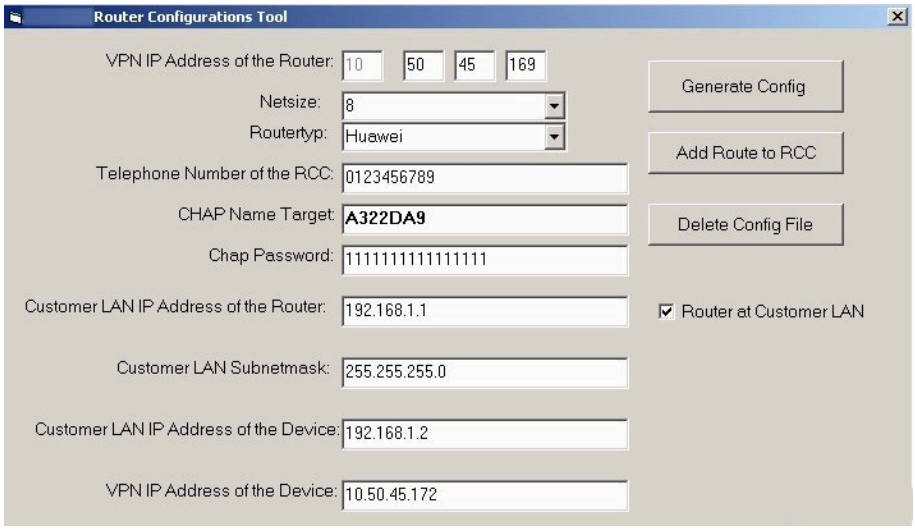


Configuration parameters for the SPoA connection

Entry Field	Explanation
VPN IP Address of the Router	VPN Address of the Router. In coordination with the RCC.
Netsize	Reachable endpoints with IP addresses in the network. The entry here is 8. Higher values (16, 32 etc) neccessary if the number of netpoints are accordingly high (therefor always add 4 endpoints). Additionaly take four more netpoints into account for reserve. Is the number for the reserve not available the next netsize has to be used. Because the endpoints can be reached via HiSPA, use this setting only for access via the router. In coordination with the RCC.
Routertyp	Chose between HUAWEI and Cisco Router
Telephone Number of the RCC	The RCC call back number. In coordination with the RCC.
CHAP Name Target	This parameter is entered automatically and is later used by SIRA (provided by the RCC). In coordination with the RCC.
Chap Password	Here 16 times "1" is entered (1111111111111111) by default.

Entry Field	Explanation
Customer LAN IP Address of the Router	IP address of the Router in the customer network. In coordination with the RCC.
Customer LAN Subnetmask	Subnet Mask In coordination with the RCC.
Customer LAN IP Address of the Device	IP address e.g. of the first device (e.g. SESAP sever, OpenScape 4000) for connectivity test through the RCC.
VPN IP Address of the Device	VPN address e.g. of the first device (e.g. SESAP sever, OpenScape 4000).

Configuration parameter for the SPoA connection including the first device for scenario Section 52.3.2.2, "Direct Access SPoA Router with netpoints":

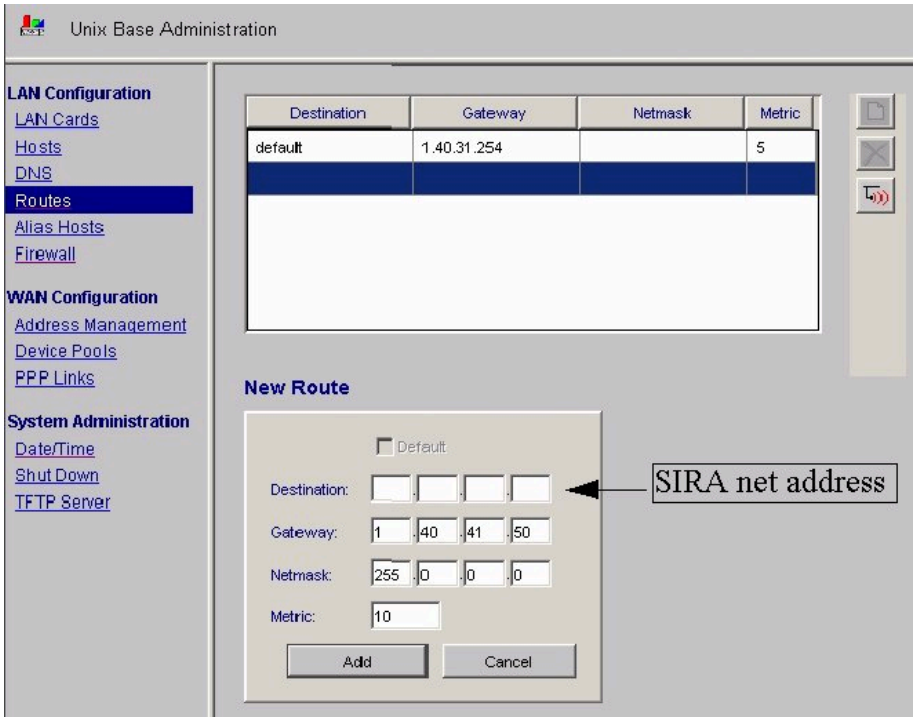


Entry Field	Explanation
VPN IP address of the Router	VPN Address of the Router. In coordination with the RCC.
Netsize	Reachable endpoints with IP addresses in the network. The entry here is 8. Higher values (16,32 etc) are neccessary if the number of netpoints are accordingly high (therefor always add 4 netpoints). Additionaly take four more netnodes into account for reserve. Is the number for the reserve not available the next netsize has to be used. Because the endpoints can be reached via HiSPA, use this setting only for access via the router. In coordination with the RCC.

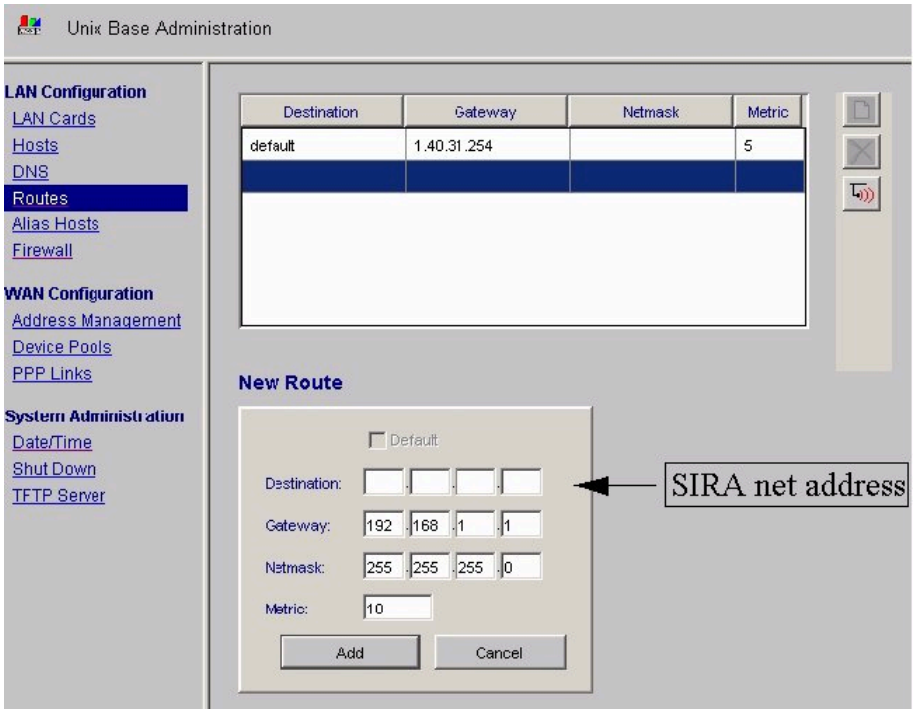
Entry Field	Explanation
Routeryp	Chose between HUAWEI and Cisco Router
Telephone Number of the RCC	The RCC call back number. In coordination with the RCC.
CHAP Name Target	This parameter is entered automatically and is later used by SIRA (provided by the RCC). In coordination with the RCC.
Chap Password	Here 16 times 1 is entered (1111111111111111) by default.
Customer LAN IP address of the Router	IP address of the router, if possible 192.168.1.1, otherwise in coordination with the customer.
Customer LAN Subnet mask	Subnet Mask 255.255.255.0, otherwise in coordination with the customer.
Customer LAN IP address of the Device	IP address of the first device, if possible 192.168.1.2, otherwise in coordination with the customer.
VPN IP address of the device	VPN address e.g. of the first device (e.g. SESAP sever, OpenScape 4000)

5) Gateway for the way back of the netpoints in the OpenScape 4000 Assistant respectively of the particular application.

Example OpenScape 4000 for the scenario Section 52.3.2.1, "SPoA Router in the Customer LAN":



Example OpenScape 4000 for the scenario Section 52.3.2.2, "Direct Access SPoA Router with netpoints":

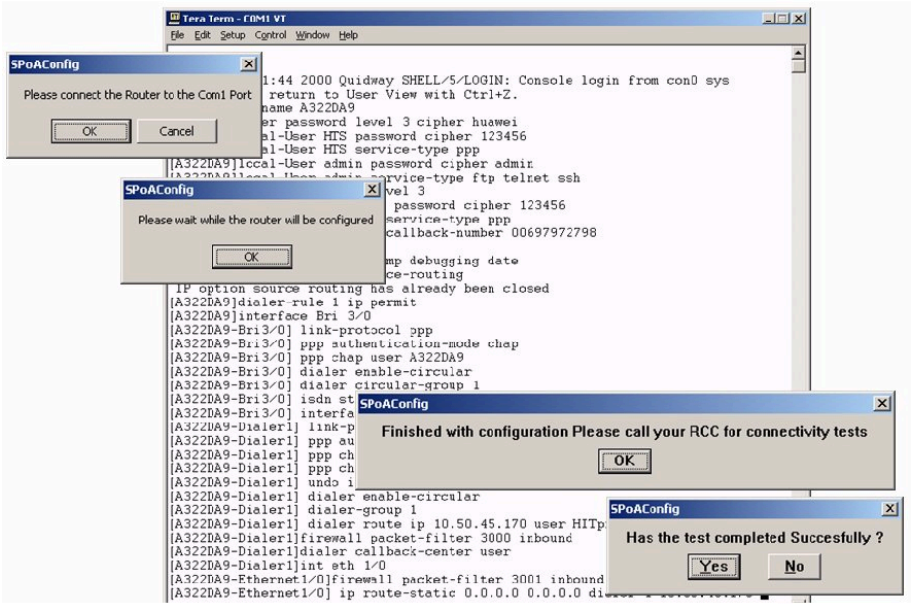


6) Switch on the router

7) Start the Router configuration with the button **Generate Config**:

It opens the window "Tera Term Com1 VT"

IMPORTANT: Do not switch off the router as the configuration is not yet saved. This can be done after a connection test from the RCC.



Huawei router configuration process

8) All further settings of the SPoA router will be done in the RCC.

5.33 Transmission and Loss Plan

5.33.1 Overview

In order to provide telephone users with the most pleasing audio quality, proper control of echo and noise is necessary while maintaining the correct receiving volume.

The feature "T - Reference point " forms the basis for the Transmission and Loss Plan integration for the I.M. and U.S. markets. The Loss Plan is implemented on a country specific basis and is administered by AMO TREF

The 'T-reference point' is a defined interface between a PABX and the public ISDN network, at which pre-defined voice signal levels must be adhered to. In order to achieve a constant voice signal transmission quality, regardless of the connection type and network size, the T-reference point conditions also apply to analog interfaces, as well as to tones heard by subscribers. The attenuation values for the voice signal and tone levels are stored in the TREF table on the hard disk, and are loaded into the database with the TREF AMO

5.33.2 Service Information

The 'T-Reference point' feature is for all systems equipped with LTUCC/LTUCE/SCC boards. All other systems will respond to any attempt to load the TREF matrix with the error message F03.

Within the system various subsytems are resonsible for enabling the Loss Plan

A.M. is responsible for configuration and definition of the Loss Plan and to specify in which country the sytem is operating. Administration is also responsible for defining the loss pair values for initialisation of boards

D.B. is resonsible for DBARs to access the defined loss plans

C.P has the resonsibility of deciding when an attenuation value has to be sent to the LTUCE/LTUCX for a given timeslot duriong a call (The LTUC/LTUCX applies the attenuation to the timeslot

Dependability (PIT) is resonsible for downloading data to the boards (existing function of parameter COFIDX in AMO's SBCSU and TACSU)

The T Reference Point Feature is the basis for the loss plan implementation for the U.S market the U.S. values being integrated into the existing feature.

5.33.3 Generation (Example)

The administration of the loss plan data is via AMO TREF

The ACTIVATE command loads a country-specific TREF matrix into the database. If no matrix exists on the hard disk for the specified country, the error message F04 will be output.

- Activate T-reference point matrix for the U.S. Default voice and tone attenuation values are loaded.
  `ACT-TREF:K;`

  (K is defined as the code for the U.S.A.)
- Activate T-reference point matrix for Germany. Default voice attenuation values are loaded. By default, tone attenuation values are 0dB.
  `ACT-TREF:0;`

  The DEACTIVATE command resets the attenuation values of the LTUCC/LTUCE/SCC board to 0dB. If no T-reference matrix was active, the advisory F05 is output.
- Deactivate T-reference point matrix
  `DEA-TREF;`

  The DISPLAY TREFTAB command shows the currently assigned voice attenuation values. If no T-reference matrix was active, the advisory H01 is output.
- Display current values of T-reference point matrix
  `DIS-TREF:TREFTAB;`

  The CHANGE TREFTAB command for attenuation between two devices only works if a T-reference matrix has already been loaded with the ACTIVATE command. If this is not the case, the error message F02 is output.

- Change attenuation value for connections from ANATE to OPTISET in the T-reference point matrix to 0dB
  `CHA-TREF:TREFTAB,ANATE,OPTISET,0DB;`

  The DISPLAY TONETAB command shows the currently assigned tone attenuation values. If no T-reference matrix was active, the advisory H01 is output.
- Display current values of T-reference tone matrix
  `DIS-TREF:TONETAB;`

  The CHANGE TONETAB command for attenuation applied to devices connected to tones only works if a T-reference matrix has already been loaded with the ACTIVATE command. If this is not the case, the error message F02 is output.
- Change attenuation value for Group 1 tones to OPTISET in the T-reference point matrix to 0dB
  `CHA-TREF:TONETAB,TONGRP1,OPTISET,0DB;`

  Tone Groups

TONE Group 1	TONE Group 2	TONE Group 3	TONE Group 4	TONE Group 5	TONE Group 6	TONE Group 7
Dial	Reorder	Call Waiting	Maintenance (test tone)	DTMF tones	SIU Voice announcements	SIU Music
Recall Dial	Busy	Busy Override				
Special Dial	Audible Ringing	Executive Override				
Message Waiting Dial	Special Audible Ringing	LCR Warning (expensive route)				
Confirmation	Intercept					
LCR Route Advance	On-Hook Queue					
	Called Party					

  IMPORTANT: Tone Group assignments may be affected if AMO ZAND (TONES) is used to change a tone's timeslot in the SIU.

  U.S. trunks can be assigned different attenuation values depending upon characteristics such as loop length and partner switch type. This is specified by the ATNTYP parameter of the trunk AMOs TDCSU and TACSU. In Europe, trunks get a default attenuation type.
- Change attenuation type for digital trunk 1-2-85-1 to TIE
  `CHA-TDCSU:PEN=1-2-85-1,ATNTYP=TIE;`

- Change attenuation type for analog trunk 1-2-109-1 to CO
  `CHA-TACSU:PEN=1-2-109-1,ATNTYP=CO;`

  Optisets can be assigned different accoustic filter IDs when connected to analog trunks in Europe. This is specified by the ACOUSTID parameter of the AMO ZAND. In the U.S., Hong Kong, and Japan, a default accoustic filter ID is used; it will not change when connected to analog trunks.
- Change to the acoustic filter ID settings for the U.S. (or Hong Kong or Japan)
  `CHA-ZAND:OPTISET,,USA;  (or HONGKONG  or JAPAN)`
- Change to the acoustic filter ID settings for Europe
  `CHA-ZAND:OPTISET,,EUROPE;`

5.34 Trunk Access with the STMA When Using the ATM Networking V2.0 Feature

5.34.1 Feature Description

S2-trunk access with the STMA is possible via an ATM switch. To make this possible, there is a new device type, TYPE=ATMPVCCO in the AMO TDCSU in the ATM Networking V2.0 (ID=5) feature.

5.34.2 Service Information

The following rules apply to trunk connection via STMA:

- Configure the STMA with BCSU and BDAT in the same way. The innovation only affects the AMO TDCSU.
- The new device type ATMPVCCO in the AMO TDCSU is similar to the old device type ATMPVC30, which means that you can configure a maximum of 4 S2 trunk circuits for each STMA.
- The clock production can only be implemented for each STM-1 interface.
- You can add the ATMPVCCO circuits to existing ATMPVC and ATMSVC circuits if there are still enough free time slots or ports. In this regard, an ATMPVCCO circuit behaves like an ATMPVC30 circuit. All other rules that apply to ATMPVC circuits also apply in this case (for example, you cannot switch on the ATMPVCCO circuit until you have switched off all ATMSVCs that are configured on the STMA.
- For STMA trunk access, only device type ATMPVCCO with a maximum of 30 B channels is possible.

- The ATM-specific parameters in the AMO TDCSU of the ATMPVCCO circuit (VPI, VCI, PORT, etc.) correspond exactly to those of the ATMPVC30.
  - Always set the filling level parameter to the default value FILLLEV=47.
  - You can select all other TDCSU parameters (COP, COT, COS, etc.) in exactly the same way as for the previously known S0/S2 trunk access via DIU-S2 or STMD.
  - The exception is the COP parameter RRST, which you must also set on all ATMPVC circuits (but there is an appropriate message if this parameter is missing and you cannot configure the circuit without it).
  - The circuit seizure order (TDCSU parameter SRCHMODE) should - if possible - be set to the opposite of that of the central office system. That is, if the central office system is set to linear-increasing, the ATMPVCCO should be set to linear-decreasing and vice versa.
- The STMA is connected to the STM-1 interface of the ATM switch. You must connect the S2 trunk with a CES-E1 interface of the ATM switch. Configure a PVC with a bandwidth of 2244 Kbps (when filling level = 47 on the STMA) in the ATM switch between the STM-1 and CES-E1 port.

5.34.3 Example Configuration

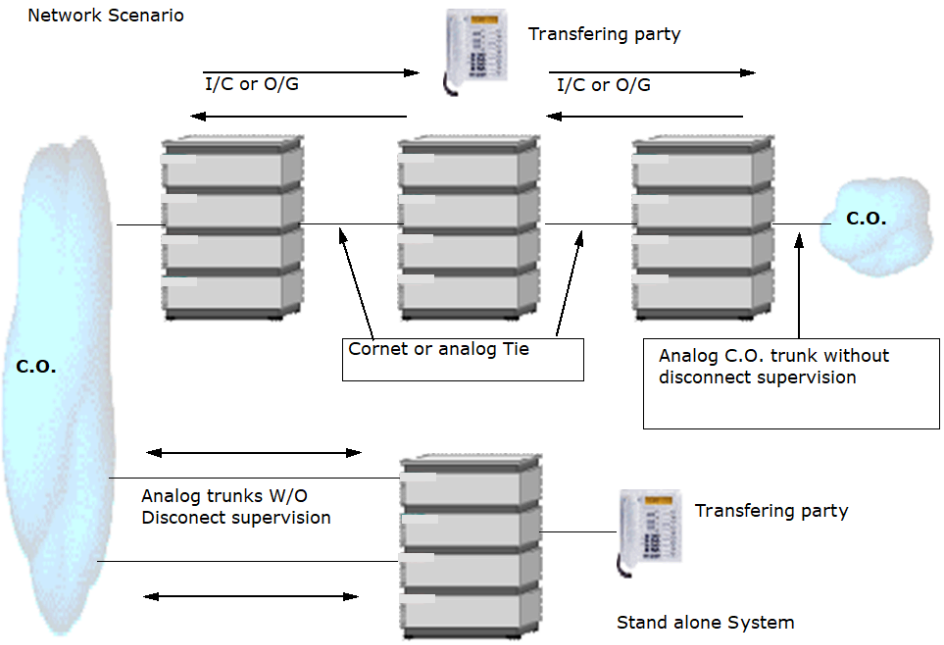
- Configure ATM circuit

```
ADD-
TDCSU:OPT=NEW,PEN=1-02-115-2,COTNO=2,COPNO=2,DPLN=0,ITR=0,COS=1
LCOSV=1,LCOSD=1,CCT="STMA-
CO",DESTNO=4,PROTVAR=EDSGER,SEGMENT=1,TCHARG=N,
SATCOUNT=MANY,NNO=1-10-155,CARRIER=1,ZONE=EMPTY,COTX=201,DEV=AT
TGRP=155,SRCHMODE=ASC,BCHAN=1&&30,BCNEG=N,BCGR=1,INS=Y,PERMACT1
PERMACT2=Y,MASTER=N,TEIVERIF=N,FIXEDTEI=0,CNTRNR=255,PGRP=3,ERR
FILLLEV=47,DCHAN=16,VPI=0,VCI=84;
```

5.35 Trunk to Trunk Supervised Connection

5.35.1 Overview

The Trunk to Trunk Supervised connection (TTS) offers the possibility for trunks that do not provide disconnect supervision to be connected together in a "supervised connection".



5.35.2 Feature Description

If the TTS connection' conditions are met, then the connection may be allowed, with the use of the automatic trunk-to-trunk recall timer, as described below. Upon expiration of the timer , the call is recalled to an attendant console so that an operator can manually supervise the connection. If the attendant group is in night mode, then the night -recall timer starts and the connection will be automatically released when it expires.

5.35.3 User Interface

- Certain rules must be met when establishing a TTS connection:
  1) The station user is allowed to transfer trunks (TTT attribute in COS) or it is an attendant:
  2) Both transferred trunks are trunks with no disconnect supervision:
  3) Other AMOs which allow the transfer must be set
- Features that may connect trunks and create TTS connection:

  Transfer from Consultation

  Transfer from Conference

  Transfer Before Answer

  Transfer from Join (Attendant)

  Single Step Transfer

  ACD - Route Off Destination
- If a supervised connection is created, then, when the trktotrk timer expires, the ITR group set in VFGR ITDEST will intercept the recall
- When the operator answers the recall, a conference between the trunks and attendant is created. The operator may release this call pressing the

RELEASE key or may re-extend the trunks connection by pressing the EXTEND key (in this case creating a new supervised connection).

5.35.4 Service Information

The TTS connection feature is intended for the global marketplace.

5.35.5 Generation (Example)

How to add the TTS connection feature into the system:

General Settings:

- Allow CO to CO transfer
  `CHA-ZAND:ALLDATA,EXCOCO=YES;`
- Change transfer type to extend
  `CHA-ZAND:ALLDATA,TRANSFER=EXTEND;`
- Trunks participating to the transfer:
  `CHA-COT:cotno,COTADD,CEBC&CEOC;`
- Setting the trunks timer duration:
  `CHANGE-CTIME:TYPESWU=CP2,NIRECALL=900,TRKTOTRK=120;`

  (values are in the range 60 - 1800 seconds for both parameters)

  Transferring Device' Settings:
- Transferring Device being station or trunk must have TTT in its COS (not necessary for attendant)e.g. for cos 1:
  `CHANGE-COSSU:TYPE=COS,COS=1,AVCE=TTT;`

  Transferred Trunks' Settings:
- Incoming Trunks with no disconnect supervision (e.g COT 1)
  `CHANGE-COT:COTNO=1,COTTYPE=COTDEL,PAR=DSIT;`
- Outgoing Trunks with no disconnect supervision (e.g. COT 1)
  `CHANGE-COT:COTNO=1,COTTYPE=COTADD,PAR=NRAA&NRBA&TWDS;`

5.35.6 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COT	TWDS	d	Umlegen zulässig bei überwachter Verbindung
		e	Transfer allowed in a supervised connection
	DSIT	d	Auslöseüberwachung in kommender Richtung
		e	Disconnect Supervision in the Incoming Direction
	KRVM	d	Kein Auslösen vor Melden

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	NRBA	e	No Release Before Answer
	MVLT	d	Meldeüberwachung
	ANS	e	Answer Supervision
COSSU	VAA	d	Gerät zum Umlegen von Amtsleitungen berechtigt
	TTT	e	Device allowed to transfer trunks
CTIME	NIRECALL	d	Dauer bei überwachten Verbindungen
		e	Duration in a Supervised Connection
	TRKTOTRK	d	Dauer bei überwachten Verbindungen
		e	Duration in a Supervised Connection

5.36 Virtual Numbering (VNR)

5.36.1 Introduction

The Virtual Numbering – VNR feature in OpenScape 4000 supports :

- the multiple assignment of station numbers,
- the configuration of overlapping station numbers with different lengths (dependent on DPLN groups).

Multiple virtual nodes must be created for this in the OpenScape 4000 (the physical node). These are defined with node number and node code.

The station ports configured are each assigned to one of the virtual nodes. The station number of a station port is now only unique within the virtual node.

The unique identification of a station within the physical node is only possible with the combination of the node code and station number.

5.36.1.1 Prerequisites

Activation/deactivation of the VNR feature is only possible in combination with **regeneration**.

The same requirements as for earlier OpenScape 4000 system versions apply to other communication systems in a network with a VNR system. Detailed information is provided in the Release Notes. Administrative changes are also required in the network for network-wide station availability.

5.36.1.2 Scenarios

The requirements for this feature are based on the following customer scenarios:

- Branch network optimization - a company with a branch network with a single physical system,
- Shared Use of a OpenScape 4000 by Different Companies.

5.36.1.2.1 Branch network optimization - a company with a branch network with a single physical system

Initial scenario

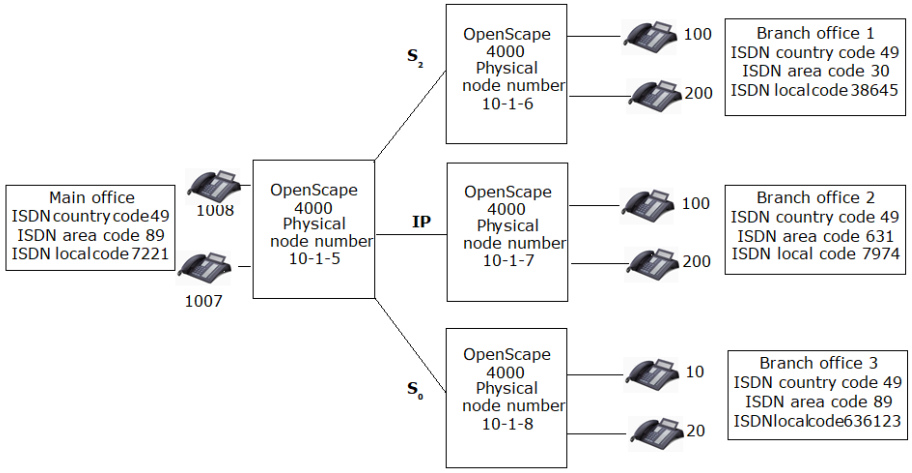


Figure 73: Corporate network with multiple OpenScape 4000s and non-unique station numbers

Target scenario:

Identical station structure but with only one OpenScape 4000, two access points and HFA terminals The Virtual Numbering feature supports the use of multiple identical or overlapping numbering plans within a OpenScape 4000.

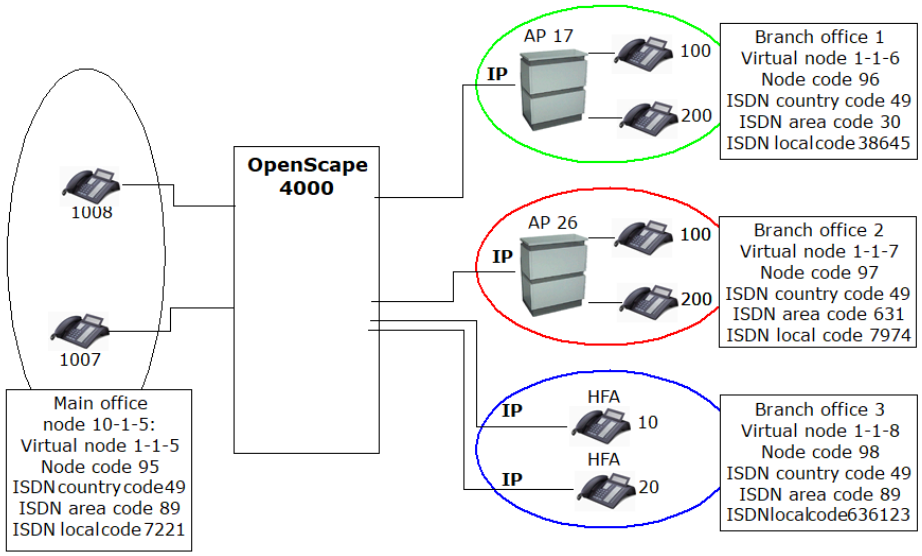


Figure 74: Corporate network with one OpenScape 4000, two access points and HFA terminals

5.36.1.2.2 Shared Use of a OpenScape 4000 by Different Companies

Initial scenario

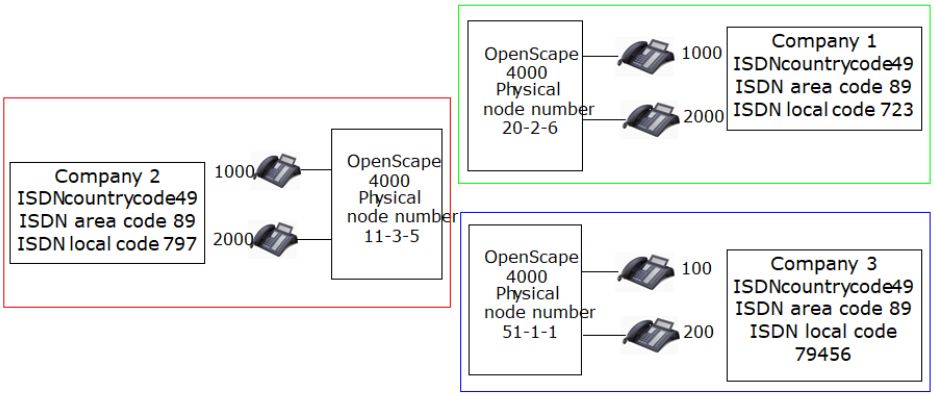


Figure 75: Three companies with independent communication systems

Target scenario:

Three independent companies are assigned a virtual node in a shared OpenScape 4000. These virtual nodes are not restricted to APs or the OpenScape 4000 host system.

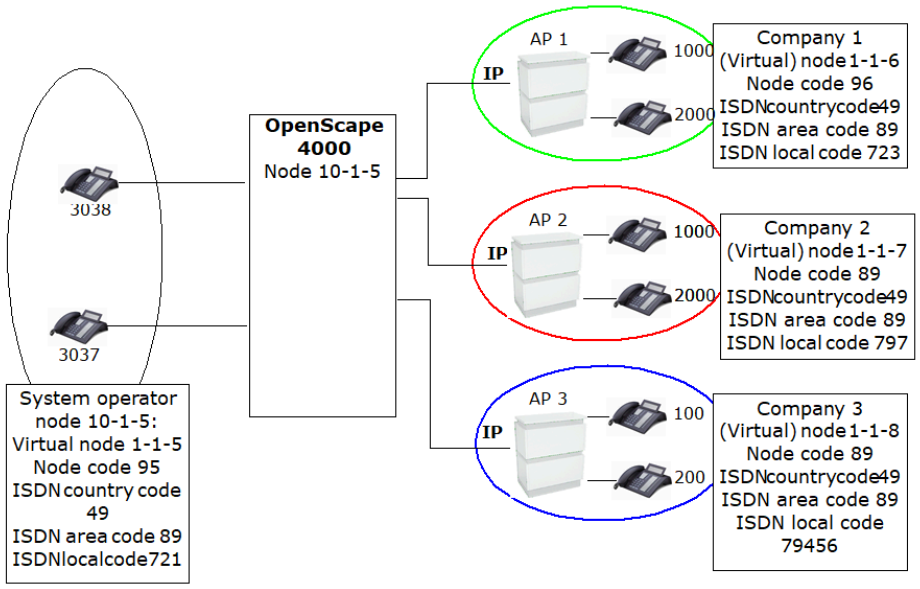


Figure 76: Three independent companies are assigned a virtual node in a shared OpenScape 4000

5.36.2 Properties

5.36.2.1 Station Availability

The activation of this feature changes how stations are reached via their station number. This must be taken into consideration when analyzing requirements. The following is an example of availability with regard to Figure 77:

Table 18: Station availability in multiple virtual nodes

to	Call from	
	Stn 1008 in the main office Virtual node 1-1-5 Node code 95 ISDN country code 49 ISDN area code 89 ISDN local code 7221 can dial the following:	Stn 10 in branch office 3 Virtual node 1-1-8 Node code 98 ISDN country code 49 ISDN area code 89 ISDN local code 636123 can dial the following:
100 in branch office 1 Virtual node 1-1-6 Node code 96 ISDN country code 49 ISDN area code 30 ISDN local code 38645	0 0049 30 38645 100 for INTERNAT 0 030 38645 100 for NATIONAL 96 100 for UNKNOWN	0 0049 30 38645 100 for INTERNAT 0 030 38645 100 for NATIONAL 96 100 for UNKNOWN
Stn 1007 in the main office node 10-1-5: Virtual node 1-1-5 Node code 95 ISDN country code 49 ISDN area code 89 ISDN local code 7221	0 0049 89 7221 1007 for INTERNAT 0 089 7221 1007 for NATIONAL 0 7221 1007 for LOCAL 1007 for UNKNOWN (95 1007 optional)	0 0049 89 7221 1007 for INTERNAT 0 089 7221 1007 for NATIONAL 0 7221 1007 for LOCAL 95 1007 for UNKNOWN

to	Call from	
	Stn 1008 in the main office Virtual node 1-1-5 Node code 95 ISDN country code 49 ISDN area code 89 ISDN local code 7221 can dial the following:	Stn 10 in branch office 3 Virtual node 1-1-8 Node code 98 ISDN country code 49 ISDN area code 89 ISDN local code 636123 can dial the following:
Stn 20 in branch office 3 Virtual node 1-1-8 Node code 98 ISDN country code 49 ISDN area code 89 ISDN local code 636123	0 0049 89 636123 20 for INTERNAT 0 089 636123 20 for NATIONAL 0 636123 20 for LOCAL 98 20 for UNKNOWN	0 0049 89 636123 20 for INTERNAT 0 089 636123 20 for NATIONAL 0 636123 20 for LOCAL 20 for UNKNOWN (98 20 optional)

5.36.2.2 Feature Principles

1) When you activate this feature, a station number is only unique if combined with a node code. Station numbers for multiple assignment continue to be configured in the AMO WABE with the digit analysis result **STN** .

2) Stations can be reached in a virtual node with their station number, even without a node code.

3) Idle terminals display the station number without the node code. Exception: SIP end points. These show the node code in the idle status.

4) The display format for the station number in ringing or call status can be set individually for each customer (ISDN, PNP and unknown). This setting then applies to all stations in the entire physical node.

5) Overlapping station numbers (10, 100, 1000) should be configured on the basis of DPLN groups.

6) The node code and station number may not exceed 6 characters in length. This yields a maximum station number length of 12 digits.

5.36.2.3 Special Features and Restrictions

Special Features

The following special features arise due to the use of VNR:

- Station numbers should be configured as DPLN-dependent with VNR The stations can only be assigned to the DPLN groups specified in the KNDEF

parameter ADPLN. For the example in Figure 78, the stations are assigned to the DPLN groups as follows:

Station number	WABE
95,96,97,98	All
10,20	1
100,200	2
1007,1008	3

Examples:

  – If station 96200 dials extension 100, it reaches STN 96100.
  – If station 951007 dials extension 1008, it reaches STN 951008.

- Features, such as **PU group**, **hunt group**, **CHESE**, **direct station selection**, and **COM group**, can be configured for stations in different virtual nodes.
- The network-wide **Team CHESE** feature becomes redundant if the CHESE stations are located in a single system after the startup of a VNR node. In this case, use of the standard CHESE function can be resumed.
- The node code is required for unique identification with the **Autoset Relocate** and **Mobile HFA** features.

- Closed numbering within one system between VNR nodes.

  Feature Description

  Any station number (including personal attendant console) is reachable via its extension number (short number, without VNAC in front).

  Different VNR nodes can be grouped under one VNR group via AMO KNDEF (parameter **VNRGRP**). Inside this VNR group closed numbering is possible, considering also the right display and ACL interface.

  Please be aware that one station number can be configured in more than one virtual node. If the same number is configured in more virtual nodes inside of a VNR group, only the first found one in the data base will be used!

  Service Information

  – Only stand alone system with VNR is considered. Only the stations belonging to one physical system can use closed numbering.
  – The feature is released for any kind of device (anate, digite and functional devices). HFA and SIP subscribers are considered too, but note that no changes have been done in the login phase / HFA mobility.
  – The VNR closed numbering applies to internal and external calls to stations (only for service VOICE, not for DTE or FAX).
  – This feature considers only basic call and the following basic features related to this:
    – consultation,
    – conference,
    – transfer,
    – centralized AC-features (blind transfer / single step transfer from AC, recall from Hold),
    – call completion (call back) on busy / free,
    – Call forwarding execution,
    – integrated OpenScape 4000 Call log and CLIR.
  – The display presents only the short number inside one VNR group (on calling and called side).
  – Only DISPMOD = UNKNOWN & ISDN are considered.
  – CCBS from CO is only working with its own ISDN number.

  IMPORTANT: The service technicians should be aware at configuration to assure that VNR Closed Numbering makes sense for the VNR nodes that are part of a certain VNR group (considering DPLN, ITR restrictions, number overlapping).

  Generation (Example):

```
CHANGE-ZANDE:TYPE=ALLDATA,DISPMOD=UNKNOWN;
```

CHANGE-ZANDE:TYPE=ALLDATA,DISPMOD=ISDN;

Activation of the feature in the system:
CHANGE-ZANDE:TYPE=ALLDATA,VNRCN=YES;

Group different VNR nodes under one VNR group:
CHANGE-KNDEF:NNO=<number>,**VNRGRP=<number>**;

The AMO KNDEF parameter **VNRGRP** allows to group different VNR nodes under one VNR group. Within this group closed numbering is possible between stations belonging to different VNR nodes.

Changing the value for **VNRGRP** is only allowed when "VNR Closed Numbering"' is activated in the system (with AMO ZANDE).

Default: **VNRGRP=0**. This means no membership to a certain VNR group; any other value means that the VNR node is part of the specified VNR group.

Restrictions

The following restrictions must be observed:

- Keysets with lines via different virtual nodes are not supported. This restriction also applies for the network-wide Team CHESE function.
- The members of the one number service must be located within a virtual node. Otherwise false information is displayed.
- A code hunt group cannot be assigned to a virtual node. It should always be considered for the entire physical node. A workaround is possible with floating stations as a master hunt group.

5.36.2.4 Limiting Values

The following limiting values must be specifically observed in connection with VNR:

- No more than 16 DPLN groups (AMO WABE, parameter **DPLN**),
- No more than 16 attendant console groups (AMO VFGR, parameter **ATNDGR**),
- No more than 254 destination numbers (AMO WABE, parameter **DESTNO**), (AMO DIMSU, parameter **NWNUNSUB**)

5.36.2.5 Converting to VNR

When converting from a non VNR OpenScape 4000/HiPath 4000 network to a VNR OpenScape 4000/HiPath 4000 network the following items have to be considered:

Table 19: Converting to VNR

Keyword	Brief Description
Autoset Relocate / Mobile HFA	The node code is needed for unique identification.

Keyword	Brief Description
CMI	All stations and the extension connections associated with an SLC board must be assigned to the same virtual node. The CMI instructions on upgrading to VNR must be followed.
DTENO/FAXNO & STN	DAR=DTENO/FAXNO can no longer be used in CPS 6, 10, 11, and 12 to prevent interception for stations (faxes and modems) because, in contrast to stations, the node code is not appended to the DAR DTENO & FAXNO. This is why it is not possible to assign a node to them. As a workaround, we recommend configuring all station numbers as DAR=STN and setting up system forwarding to the DAR= DTE + own station number or FAX + own station number.
DNIT	DNIT station numbers are not modified on the basis of the node code. It is thus impossible to uniquely assign them to a virtual node or even to use individual numbers repeatedly. Moreover, a number can only be configured as a DNIT number if it is configured for DPLN=0 or ALL DPLN groups. We therefore recommend configuring six-digit DNIT numbers in a free number range. Known station numbers are configured as a floating station and routed to the associated DNIT station number via system forwarding.
Call data recording	The node code + extension are always sent by default to call data recording. Changes are possible with the AMO GEFE.
Internal E.164 dialing	An appropriate LCR configuration is needed for this.
KNDEF	ISDN and node codes must be unique. DPLN is used for the DIAL operation in this node. If multiple DPLN groups are needed for the station, then the "allowed DPLN groups" should be entered under ADPLN, otherwise we recommend setting the ADPLN as equal to the DPLN to avoid configuration errors.
KNMAT	As station numbers are automatically modified with ITR, KNMAT should not be used in a VNR system. Call data modification should be performed with the AMO GEFE. PUBNUM in AMO SDAT should be used instead of the replacement extension (REPEXT).
KNMAT / ITR	Connections cannot be restricted in a physical system with KNMAT. Restrictions are only possible with ITR.

Keyword	Brief Description
Cross node features	PU, HT, CHESE, DSS, COM group. The relevant stations can be distributed across multiple nodes.
LCR / two-stage LCR	We recommend using two-stage LCR for a better overview of the LCR process, especially in the event of breakout in different locations or countries and to simplify expansion. Please note that a number of functions cannot be performed with RERTEINT, such as REMAC in AUN and ONS. These should be entered as international numbers in this case.
Features within a virtual node	Keysets => network-wide Team/Chese - The relevant station numbers must be located within a virtual node.
ONS	The members of an ONS group must belong to the same virtual node.
RCG / ACD	RCG station numbers can only be configured as DPLN-independent. This means they conflict with the VNR numbering plan. We therefore recommend configuring six-digit RCG numbers in a free number range. Old RCG numbers should then be replaced in applications by the new RCG station numbers.
RUFNUM	We strongly recommend against using the AMO RUFUM in the VNR system. A station number that is converted with the AMO RUFNUM cannot be assigned to a virtual node because the node code is not appended to it. We recommend replacing the RUFUM with a floating station with system forwarding.
Call numbers	Every virtual node must be assigned a unique node code and ISDN station number. The node code is part of the station code, the attendant console code, and the attendant code. These codes are needed to activate features (AMO ACTDA, AMO ZIEL, etc.) Closed calling is no longer possible between stations with different E.164 station numbers.
HT (code)	Node codes are not appended to the station number of a hunt group code. This number is therefore valid system-wide. You cannot assign a virtual node to it. Workaround: Change the hunt group code into a master hunt group using a floating station. PC-DACON supports this change.
HT (master)	The node code is part of the master hunt group's station number. It is therefore assigned a virtual node.
SIP /HFA	The node code is part of the station number. This station number should be signaled to the SIP and HFA terminals for logon at the gateway.

Keyword	Brief Description
TDCSU / VNNO (CO)	A trunk connection can be assigned to a virtual node using the parameter VNNO in the AMO TDCSU if the carrier does not send a unique called party number, for example, only the DID number (extension).
Network with closed numbering	Please note the following if using a OpenScape 4000 numbering plan and closed numbering: The relevant KNMAT entries that are needed to integrate an openly numbered node into an openly numbered network should be made network-wide. It is important to ensure that the node code is part of the called party in the directly connected systems.
VFGKZ	The ATNDID and ATND codes should be assigned node codes in the AMO VFGKZ.
DPLN	To avoid restrictions in expansions, these station numbers should be configured as DPLN-dependent. As this significantly increases the number of DPLNCD and DPLNGR memory blocks used in the AMO DIMSU, attention should be paid to block formation in the DPLN configuration (always 0-9, 00-99, 000-999, etc.). Example: 10&&19, 100&&159, 100&&199, 1000&&1199, 1000&&1999, 10000&&12999 etc.
DPLN / KNDEF	A DPLN group can be used for multiple virtual nodes.
DPLN - DAR	The following digit analysis results cannot be configured as DPLN-dependent: RCG, SIGNON, SIGNOFF, DSNR, PRTY, IMMED, FLASHOV, FLASH, OWNNODE, INCALTRT, FRCALTRT It is important to ensure that these codes do not conflict with the numbering scheme.
XPRESSION, DAKS etc.	In future, all connected applications that were previously switched with closed numbering must use a unique station number (E.164 or a prefixed node code). Sole exception: The application only dials stations within a virtual node. In this case, the target node code can, where applicable, be preceded by DGTPR/VNNO.
ZANDE	You can use the AMO ZANDE to set the number format for internal number display. The same number format should be used for networking.

5.36.3 Generation

5.36.3.1 Tasks Involved in Switching to VNR

- The system must be regenerated before changeover to VNR. A detailed customer network analysis with DPLN planning for the stations of the VNR system is strongly recommended.
- Each virtual node must be assigned a unique node code. This cannot be changed. All node codes must feature **DAR =OWNNODE** in the AMO WABE.
- The station terminals are generated with node codes in the relevant AMOs (SBCSU, SCSU, etc.).
- After activating the VNR feature, SIP and HFA terminals must log back on (LOGON) with node code and station number. The terminals should be provided with the new LOGIN data for this purpose.
- Each virtual node must be assigned a unique E.164 station number.
- LCR routes must be set up with reroute internal to ensure internal availability via the E.164 station number. If all virtual nodes are located in one LAN, this can be implemented using three basic "reroute internal" LCR routes (subscriber, national and international) for which the complete E.164 station number is mirrored. However, if a breakout to another location is expected in the future, we advise changing over to a two-level LCR. The associated depends on the ISDN station numbers in the VNR system.
- All station numbers assigned before feature activation in OpenScape 4000 must be expanded to include the virtual node code for all features (for example, AMO ACTDA, AMO ZIEL). (Impact on the use of DLS, PCDACON, OpenScape 4000 Manager, etc.)
- If the internal E.164 station number display (AMO ZANDE, parameter **DISPMOD=ISDN**) is used, the shortest ISDN station number possible is displayed for connections across virtual nodes such as in networking. Using the AMO KNFOR, the shortest station number display can be restricted to National or International. Within the local virtual node, only the station number without the node code is shown as usual.
- If a shared trunk connection is used to reach multiple virtual nodes, an explicit E.164 station number must always be sent by the CO. In this case, the parameter **DFNN** must not be set in the AMO TDCSU.
- Connections between virtual nodes can only be restricted with ITR. Existing KNMAT restrictions must be converted to ITR restrictions.
- The virtual node code is a component of the CHRGEE in call data recording.

5.36.3.2 Network Integration

- An openly numbered network is basically a network with at least one VNR node (OpenScape 4000 with the feature "Virtual Numbering" active).

- The following measures are necessary for closed numbering:
  - The usual KNMAT entries that are needed for open numbering in an OpenScape 4000/HiPath 4000 network are required in all OpenScape 4000 systems in the network
  - In addition to the KNMAT modification in the systems directly connected to the VNR system, an OUTPULSE must be configured in the AMO LODR with the node code for the VNR system.
  - Evaluations should be performed to check the effect of open numbering on existing applications and if any adjustments are necessary.
  - Adjustments may be necessary in call data recording.
  - In VNR systems, all virtual nodes that have the same E.164 station number must be assigned the same node number network-wide. It is not necessary to adapt the existing standard OpenScape 4000/HiPath 4000 network. In the case of network expansions and significant modifications, this concept should be adopted with a view to achieving a clear network structure.

5.36.3.3 Description of the AMO Application

IMPORTANT: This section assumes general configuration skills, such as the ability to configure trunks, stations and features. Information on these topics is provided in the corresponding chapters of the service manual.

IMPORTANT: The configuration steps described in the following are based on Figure 78.

5.36.3.3.1 Feature Activation

As already mentioned, regeneration is necessary if the use of non-unique station numbers is enabled in OpenScape 4000. The VNR parameter is set to YES in the AMO ZANDE for definition on a VNR system:

```
CHANGE-ZANDE:TYPE=ALLDATA,...,VNR=YES;
```

5.36.3.3.2 Digit Analysis and Node Definitions

Before we come to the configuration of digit analysis and node definitions, a few explanations are needed on the relationships between the AMOs WABE and KNDEF:

Outgoing dialing is performed with the station's DPLN (AMO SBCSU).

When **DAR OWNNODE** is reached, dialing with the DPLN of the destination node (AMO KNDEF) continues from this point.

Here is an example as an aid to understanding:

Let's consider station (95)1007 from virtual node 1-1-5 and station (98)10 from virtual node 1-1-8.

Virtual node 1-1-5 uses four-digit numbering, such as 1007.

Virtual node 1-1-8 uses two-digit numbering, such as 10.

If station (95)1007 wants to call station (98)10, then the dial plan must be adjusted to the destination node after the node code is dialed.

Station number "10" does not produce a result in the DPLN of the station (95)1007.

The outcome is identical if station (98)10 calls station (95)1007.

Station number "10" produces a result in the DPLN associated with station (98)10, but dialing is incomplete in virtual node 1-1-5.

For this reason, subsequent dialing is evaluated with the DPLN of the destination node when **DAR OWNNODE** is reached.

The parameter **ADPLN** (permitted DPLN) defines which DPLN groups may be assigned to the members of a virtual node.

If the parameter ADPLN associated with a virtual node is assigned multiple DPLN groups, ensure that the node-dependent station numbers (such as STN, ATNDDID, ATNDIND, ATND, etc.) are identically configured.

The DPLN is now configured following the generation sequence. The following should be noted here:

- The **DAR OWNNODE** should always be configured independently of the DPLN.
- In contrast to earlier versions, the **DAR STN** can now be configured dependent on the DPLN. In the case of a VNR system, we recommend generating the **DAR=STN** dependent on the DPLN to avoid problems with future expansions.

First the physical node code that is entered in the AMO ZAND as **PNODECD** is configured as **DAR=OWNNODE**.

The physical node code must be unique network-wide, and should not correspond to any virtual node code as virtual nodes can be distributed over several physical nodes.

As the user does not select the physical node code, station numbers are frequently entered with ***** to avoid limiting the numbering scheme:
`ADD-WABE:CD=95,DAR=OWNNODE,CHECK=N;`

DAR=OWNNODE should also be configured for all account codes in the virtual nodes:

```
ADD-WABE:CD=95,DAR=OWNNODE,CHECK=N;

ADD-WABE:CD=96,DAR=OWNNODE,CHECK=N;

ADD-WABE:CD=97,DAR=OWNNODE,CHECK=N;

ADD-WABE:CD=98,DAR=OWNNODE,CHECK=N;
```

The station numbers are now configured on the basis of DPLN groups. To avoid running out of memory in the AMO DIMSU, parameters DPLNGR/DPLNCD, entire station number blocks are prepared where possible:

```
ADD-WABE:CD=10&&29,DPLN=0,DAR=STN;

ADD-WABE:CD=100&&299,DPLN=1,DAR=STN;

ADD-WABE:CD=1000&&1999,DPLN=2,DAR=STN;
```

Next, the physical node number and node code are entered in the AMO ZAND:

```
CHANGE-ZAND:TYPE=ALLDATA,...,PNNO=10-1-5,PNODECD=**95;
```

The virtual nodes are now configured with the AMO KNDEF. This involves assigning the unique ISDN station number (E.164 station number) and the unique node code:

```
ADD-KNDEF:NNO=1-1-5,TYPE=OWN, ISDNCC=49,ISDNAC=89,
ISDNLC=7221,ISDNSK=4, NODECD=95,NODECDSK=2,DPLN=2,ADPLN=2;

ADD-KNDEF:NNO=1-1-6,TYPE=OWN, ISDNCC=49,ISDNAC=30,
ISDNLC=38645,ISDNSK=5,NODECD=96,NODECDSK=2,DPLN=1,ADPLN=1;

ADD-KNDEF:NNO=1-1-7,TYPE=OWN,
 ISDNCC=49,ISDNAC=631,ISDNLC=7974,
ISDNSK=4, NODECD=97,NODECDSK=2,DPLN=1,ADPLN=1;

ADD-KNDEF:NNO=1-1-8,TYPE=OWN,
 ISDNCC=49,ISDNAC=89,ISDNLC=636123,
ISDNSK=6, NODECD=98,NODECDSK=2,DPLN=0,ADPLN=0;
```

5.36.3.3.3 Station Configuration

The stations are now configured. Note that the node code is part of the station number with which the station is configured.

Add the station for virtual node 1-1-5:

```
ADD-SBCSU:STNO=951007,OPT=OPTI,CONN=DIR,PEN=1-1-3-0,
DVCFIG=OPTIIP,COS1=1,COS2=1,LCOSV1=1, LCOSV2=1,LCOSD1=1,
LCOSD2=1,DPLN=2;

ADD-SBCSU:STNO=951008,OPT=OPTIIP,CONN=DIR,PEN=1-1-3-0,
DVCFIG=OPTIIP,COS1=1,COS2=1,LCOSV1=1,LCOSV2=1,LCOSD1=1,
LCOSD2=1,DPLN=2;
```

Add the station for virtual node 1-1-6:

```
ADD-SBCSU:STNO=96100,OPT=OPTI,CONN=DIR,PEN=1-17-3-0,
DVCFIG=OPTIIP,COS1=1,COS2=1,LCOSV1=1, LCOSV2=1,LCOSD1=1,
LCOSD2=1,DPLN=1;

ADD-SBCSU:STNO=96200,OPT=OPTIIP,CONN=DIR,PEN=1-17-3-1,
DVCFIG=OPTIIP,COS1=1,COS2=1,LCOSV1=1, LCOSV2=1,LCOSD1=1,
LCOSD2=1,DPLN=1;
```

Add the station for virtual node 1-1-7:

```
ADD-SBCSU:STNO=97100,OPT=OPTI,CONN=DIR,PEN=1-26-3-0,
DVCFIG=OPTIIP,COS1=1,COS2=1,LCOSV1=1, LCOSV2=1,LCOSD1=1,
LCOSD2=1,DPLN=1;

ADD-SBCSU:STNO=97200,OPT=OPTI,CONN=DIR,PEN=1-26-3-1,
DVCFIG=OPTIIP,COS1=1,COS2=1,LCOSV1=1, LCOSV2=1,LCOSD1=1,
LCOSD2=1,DPLN=1;
```

Add the station for virtual node 1-1-8:

```
ADD-SBCSU:STNO=9810,OPT=OPTIIP,CONN=DIR,
PEN=1-1-3-1,DVCFIG=OPTIIP,COS1=1,COS2=1,
LCOSV1=1, LCOSV2=1,LCOSD1=1,LCOSD2=1,DPLN=0;
```

```
ADD-SBCSU:STNO=9820,OPT=OPTIIP,CONN=DIR,
PEN=1-1-3-2,DVCFIG=OPTIIP,COS1=1,COS2=1,
LCOSV1=1, LCOSV2=1,LCOSD1=1,LCOSD2=,DPLN=0;
```

As the stations of the virtual node are routed in different ways, source-dependent routing is required here.

The stations of the different virtual nodes are assigned to different source groups for this purpose, unless this assignment is not already fixed by a unique position within their own APs.

We will assign source group 1 to the stations in node 1-1-5.

```
CHANGE-SDAT:STNO=951000&&951999,TYPE=DATA1,SRCGRP=1;
```

We will assign source group 2 to the stations in node 1-1-8.

```
CHANGE-SDAT:STNO=9810&&9829,TYPE=DATA1,SRCGRP=2;
```

We will assign source group 17 to the stations in node 1-1-6 based on the AP number.

```
CHANGE-SDAT:STNO=96100&&96299,TYPE=DATA1,SRCGRP=17;
```

Accordingly, we will assign source group 26 to the stations in node 1-1-7.

```
CHANGE-SDAT:STNO=97100&&97299,TYPE=DATA1,SRCGRP=26;
```

Our example assumes that each virtual node also has its own central office access.

5.36.3.3.4 Trunk Configuration

First the trunk groups are prepared:

```
ADD-BUEND:TGRP=5,NAME="TRUNK GROUP ND 1-1-5",NO=30;

ADD-BUEND:TGRP=6,NAME="TRUNK GROUP ND 1-1-6",NO=30;

ADD-BUEND:TGRP=7,NAME="TRUNK GROUP ND 1-1-7",NO=30;

ADD-BUEND:TGRP=8,NAME="TRUNK GROUP ND 1-1-8",NO=4;
```

- We will configure the S2 trunk for node 1-1-5 at PEN 1-1-1-0:

  ```
  ADD-
  TDCSU:OPT=NEW,PEN=1-1-1-0,COTNO=20,COPNO=20,DPLN=0,ITR=0,COS=1,
  LCOSV=1,LCOSD=1,CCT="CO Munich
   195",DESTNO=99,PROTVAR=EDSGER,SEGMENT=1,
  ATNTYP=CO,ISDNIP=00,ISDNNP=0,TRACOUNT=8,NNO=1-1-195,TGRP=5,SRCH
  INS=Y,DEV=S2COD,BCHAN=1&&30,BCNEG=Y,BCGR=1,LWPAR=1,
   SRCGRP=1;
  ```

- We will configure the S2 trunk for node 1-1-6 at PEN 1-17-1-0:

  ```
  ADD-
  TDCSU:OPT=NEW,PEN=1-17-1-0,COTNO=20,COPNO=20,DPLN=0,ITR=0,COS=1
  LCOSV=1,LCOSD=1,CCT="CO Berlin
   196",DESTNO=99,PROTVAR=EDSGER,
  SEGMENT=1,ATNTYP=CO,ISDNIP=00,ISDNNP=0,TRACOUNT=8,NNO=1-1-196,T
  SRCHMODE=ASC,INS=Y,DEV=S2COD,BCHAN=1&&30,BCNEG=Y,BCGR=1,LWPAR=1
   SRCGRP=17;
  ```

- We will configure the S2 trunk for node 1-1-7 at PEN 1-26-1-0:

```
ADD-TDCSU:OPT=NEW,PEN=1-26-1-0,COTNO=20,COPNO=20,
 DPLN=0,ITR=0,
COS=1,LCOSV=1,LCOSD=1,CCT="CO Wiesbaden
 197",DESTNO=99,PROTVAR=EDSGER,
SEGMENT=1,ATNTYP=CO,ISDNIP=00,
 ISDNNP=0,TRACOUNT=8,NNO=1-1-197,TGRP=7,
SRCHMODE=ASC,INS=Y,DEV=S2COD,BCHAN=1&&30,BCNEG=J,BCGR=1,LWPAR=1,
 SRCGRP=26;
```

- We will configure the S0 trunk for node 1-1-8 at PEN 1-2-8-0:

```
ADD-
TDCSU:OPT=NEW,PEN=1-2-8-0,COTNO=20,COPNO=20,DPLN=0,ITR=0,COS=1,
LCOSV=1,LCOSD=1,CCT="CO Munich
 198",DESTNO=99,PROTVAR=EDSGER,SEGMENT=1,
ATNTYP=CO,ISDNIP=00,ISDNNP=0,TRACOUNT=8,NNO=1-1-198,TGRP=8,INS=Y,
DEV=S0COD,BCNEG=Y,SRCGRP=2;
```

5.36.3.3.5 LCR Configuration

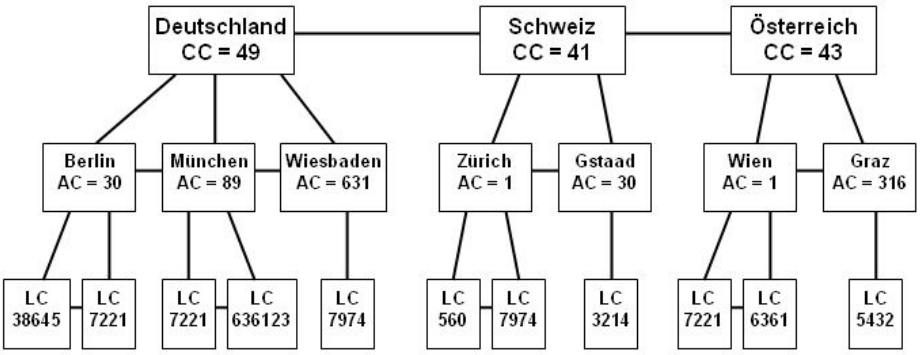
Before performing LCR configuration, you should consider the expansions to the network that may be required in the future.

Our example has just one system in Germany with trunk access distributed across three cities.

To facilitate additional breakouts in Germany or other countries at a later stage, the LCR should be structured from the outset so that breakouts to several countries can be configured without difficulty. One option here is the "two-level LCR" concept:

First let's consider a possible constellation of breakouts in different countries.

The following graphic shows the possible connections in such a network:



If, for example, a local station number is dialed, then the required destination depends on the source. A different destination is dialed for every location. This is why only one reroute internal is permitted within the same location for internal destinations with local station numbers. Likewise, routing should be carried out on an individual basis for each location.

If a national number is dialed, then the required destination is different in each country. Reroute internal is only permitted for national internal destinations within a country. Routing differs from country to country.

If an international number is dialed, then the destination is unique worldwide.

This is why we have divided the LCR into 2 levels.

5.36.3.3.6 Brief Description of 2-Level LCR

LCR level 1 - internationalization

Location-dependent modification:

The station number dialed is transformed into a unique international station number using source groups based on reroute internal.

Dialed station number -> international station number transformation

The station number dialed is converted to an international station number in accordance with the entries in the AMO KNPRE and the AMO KNDEF:

Format definition:

- Exit code (no prefix (PF)) = local area
- Exit code + national prefix (no international prefix) = national
- Exit code + international prefix = international

The station number dialed is extended to an international ISDN station number by prefixing it with the exit code, the international prefix, the relevant country code, and, in the case of local calls, with the relevant area code. Dialed prefixes are left out.

Example:

Exit code	= 0
National prefix	= 0
International prefix	= 00
Country code	= 49
Area code	= 30

Digit Pattern	-> Modification
0-W-0-X	-> 0 00 49 + X
0-W-X	-> 0 00 49 30 + X

Definition for this example:

Local station number	-> LODR /LRTE 1xx, LPROF 1

The **LRTE** and **LODR** values **1xx** (**100 to 199**) are used to extend local station numbers. They are summarized in **LPROF 1**.

National number	-> LODR /LRTE 2xx, LPROF 2

The **LRTE** and **LODR** values **2xx** (**200 to 299**) are used to internationalize national numbers. They are summarized in **LPROF 2**.

LCR level 2 - routing

Source-based routing:

The international station number is routed to the destination, depending on the source group.

Routing international numbers

Internal station numbers are routed back to the local node based on reroute internal. The other station numbers are routed individually dependent on the source group.

Internal routing:

- Standard with LRTE 300
- Reserved for special cases: LRTE 3xx (301 - 399)

External routing (dependent on the source group):

General outdial rules:

- 400 - for international destinations (4xx reserved for special cases)
- 500 - for national destinations (5xx reserved for special cases)

LCR routes:

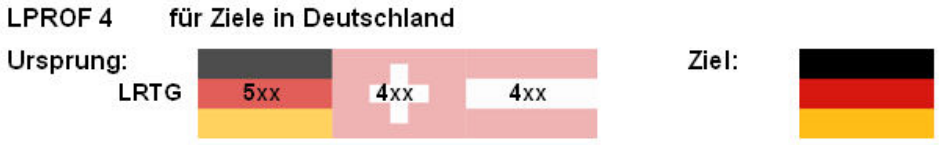
- International destinations with LRTE 4xx (401 – 499)
- National destinations with LRTE 5xx (501 – 599)

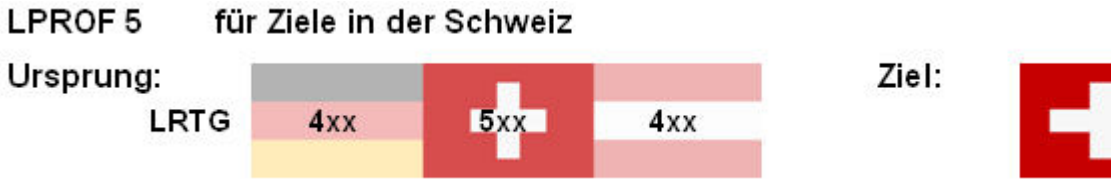
LCR profile for international destinations:

LPROF 3 - contains only LRTG 4xx - for international destinations. No local breakout.

LCR profiles per country with CO breakout for national destinations:

Depending on the breakout country, LPROF 4 and those that follow contain a combination of LRTE 4xx for international destinations and 5xx for destinations within the local country.





Example

LCR level 1:

An LCR route is required for each local area network so as to convert the dialing of local area codes into a unique international station number.

Since this station number is immediately to pass through LCR again if it originates from LCR, it is not modified by the AMO KNPRE. This is why the destination number must be entered implicitly in the outdial rule, in other words, with an exit code and international prefix.

The following figure shows the digits to be expanded per location or country. The small boxes containing numbers represent the source groups.

Local numbers use the 100 outdial rules and LCR routings, national number use the 200 outdial rules.

The diagram shows which source group belongs to which local area and which digits are to be added when dialing the local or national network.

For the remaining configuration, we will only consider "our own network" to begin with.

Let's begin with the configuration of the outdial rules for reroute internal: (With exit code and international prefix)

Outdial rules 1xx (100 -199) are provided for modifying local station numbers:

- Outdial rule 100 for Berlin:

```
ADD-LODR:ODR=100,CMD=OUTPULSE,DGTS=0004930;

ADD-LODR:ODR=100,CMD=ECHO,FIELD=3;

ADD-LODR:ODR=100,CMD=NPI,NPI=ISDN,TON=UNKNOWN;

ADD-LODR:ODR=100,CMD=END;

ADD-LODR:ODR=100,INFO="LODR for Berlin";
```

- Outdial rule 101 for Munich

```
ADD-LODR:ODR=101,CMD=OUTPULSE,DGTS=0004989;

ADD-LODR:ODR=101,CMD=ECHO,FIELD=3

ADD-LODR:ODR=101,CMD=NPI,NPI=ISDN,TON=UNKNOWN;

ADD-LODR:ODR=101,CMD=END;

ADD-LODR:ODR=101,INFO="LODR for Munich";
```

- Outdial rule 102 for Wiesbaden

```
ADD-LODR:ODR=102,CMD=OUTPULSE,DGTS=00049631;

ADD-LODR:ODR=102,CMD=ECHO,FIELD=3;

ADD-LODR:ODR=102,CMD=NPI,NPI=ISDN,TON=UNKNOWN;

ADD-LODR:ODR=102,CMD=END;

ADD-LODR:ODR=102,INFO="LODR for Wiesbaden";
```

We use the 2xx (200 – 299) outdial rules to modify national station numbers:

- Outdial rule 200 for Germany:

```
ADD-LODR:ODR=200,CMD=OUTPULSE,DGTS=00049;

ADD-LODR:ODR=200,CMD=ECHO,FIELD=4;

ADD-LODR:ODR=200,CMD=NPI,NPI=ISDN,TON=UNKNOWN;

ADD-LODR:ODR=200,CMD=END;

ADD-LODR:ODR=200,INFO="LODR FOR Germany";
```

LCR route configuration:

One LCR route is required per city. We use the numbers of the outdial rule as an index for the LRTE. (1xx = 100 – 199)

```
ADD-RICHT:MODE=LRTENEW,LRTE=100,LSVC=ALL,
NAME="City Berlin",TGRP=6,DNNO=1-1-199;

ADD-RICHT:MODE=LRTENEW,LRTE=101,LSVC=ALL,
NAME="City Munich",TGRP=5,DNNO=1-1-199;

ADD-RICHT:MODE=LRTENEW,LRTE=102,LSVC=ALL,
NAME="City Wiesbaden",TGRP=7,DNNO=1-1-199;

ADD-LDAT:LROUTE=100,TGRP= 6,ODR=100,LAUTH=1,LATTR=RERTEINT;

ADD-LDAT:LROUTE=101,TGRP= 5,ODR=101,LAUTH=1,LATTR=RERTEINT;

ADD-LDAT:LROUTE=102,TGRP= 7,ODR=102,LAUTH=1,LATTR=RERTEINT;
```

An LCR route is also required for all countries (LRTE 2xx = 200 – 299):

```
ADD-RICHT:MODE=LRTENEW,LRTE= 200,LSVC=ALL,
NAME="Germany",TGRP=5,DNNO=1-1-299;

ADD-LDAT:LROUTE=200,TGRP= 5,ODR=200,LAUTH=1,LATTR=RERTEINT
```

We now come to the source-dependent LCR:

The LCR routes are summarized in LCR profiles. Each source group is assigned an LCR route.

Reminder:

We have already made the following assignments:

Node	Source group	Local area	Local area Ã▪ LRTE
1-1-5	1	Munich	101
1-1-6	17	Berlin	100
1-1-7	26	Wiesbaden	102
1-1-8	2	Munich	101

We use **LCR profile 1** to modify **local station numbers**:

```
ADD-LPROF:PROFNAME="SUBSCR TO INTERNAT",SRCGRP=1,
LRTE= 101,PROFIDX=1;

CHANGE-LPROF:PROFIDX=1,SRCGRP=2,LRTE=101;

CHANGE-LPROF:PROFIDX=1,SRCGRP=17,LRTE=100;

CHANGE-LPROF:PROFIDX=1,SRCGRP=26,LRTE=102;
```

We use **LCR profile 2** to modify **national station numbers**:

```
ADD-LPROF:PROFNAME="NATIONAL TO INTERNAT",SRCGRP=1,
LRTE= 200,PROFIDX=2;

CHANGE-LPROF:PROFIDX=2,SRCGRP=2,LRTE=200;

CHANGE-LPROF:PROFIDX=2,SRCGRP=17,LRTE=200;

CHANGE-LPROF:PROFIDX=2,SRCGRP=26,LRTE=200;
```

LCR level 1 will be complete as soon as the selected station numbers are assigned to the LCR profiles. The LCR required for this purpose can be derived from the AMO KNPRE:

- The exit code is "0".
- The national prefix is "0".
- The international prefix is "00".

If the ISDN exit code is now dialed and neither of the prefixes, then a **local station number** is dialed. The associated digit pattern is assigned to **LCR profile 1**:

```
ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=0-W-X,
PROFIDX=1,LAUTH=1;
```

If the ISDN exit code is dialed, followed by the national prefix, but not by the international prefix, then a **national station number** is dialed. **LCR profile 2** is used for the dialing process in this case:

```
ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=0-W-0-X,
PROFIDX=2,LAUTH=1;
```

LCR level 1 is now fully generated. The international station number is evaluated in LCR level 2.

LCR level 2:

Only station numbers in international format are evaluated in level 2. They have the same destination worldwide.

The following routing rules are defined for configuring LCR level 2:

- If the destination is an internal virtual node, the station number is routed back to the local node based on reroute internal.
- External breakout is always performed via the local trunk. A separate LCR is required for each source group in this case.

As some carriers do not permit national dialing with international station numbers, an additional LCR configuration is required here.

The following routes should be covered by LCR level 2:

1. Internal destinations:

A single LRTE route is initially sufficient for all source groups (see also Configuring "1. Internal destinations")

2. External international destinations:

This requires a separate LRTE for each source group, combined in a shared LCR profile.

3. External national destinations:

As certain carriers or countries do not permit connections to national destinations using the international number format, a separate LCR configuration per source group is also required for national destinations. A separate LCR profile is then created for each country, in which the LCR routes for national and international destinations are used accordingly.

In order to prevent confusion between LCR level 1 and level 2, we will define in our example that the LRTE routes 300 – 399 should be used for reroute internal. For international destinations we will use LCR routes 400-499, and for national destinations LCR routes 500-599.

Configuring "1. Internal destinations"

- Configuring an outdial rule

  Here we can use the general outdial rule for international destinations. To ensure uniform numbering, we will configure the outdial rule 300 for general reroute internal:

  ```
  ADD-LODR:ODR=300,CMD=ECHO,FIELD=4;
  ADD-LODR:ODR=300,CMD=ECHOALL;
  ADD-LODR:ODR=300,CMD=NPI,NPI=ISDN,TON=INTERNAT;
  ADD-LODR:ODR=300,CMD=END;
  ADD-LODR:ODR=300,INFO="LODR FOR REROUTE INTERNAL";
  ```

- Configuring LRTE 300 for general reroute internal:

  ```
  ADD-RICHT:MODE=LRTENEW,LRTE=300,LSVC=ALL,
  NAME="SRC01 RERT INT",DNNO=1-1-195;

  ADD-LDAT:LROUTE=501,ODR=300,LAUTH=1,LATTR=RERTEINT;
  ```

- Configuring LDPLN entries for the internal E.164 station numbers:

  ```
  ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LAUTH=1,
  LDP=0-W-00-49-89-7221-X,LROUTE=300,LAUTH=1;

  ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LAUTH=1,
  LDP=0-W-00-49-30-38645-X,LROUTE=300,LAUTH=1;

  ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LAUTH=1,
  LDP=0-W-00-49-631-7974-X,LROUTE=300,LAUTH=1;

  ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LAUTH=1,
  LDP=0-W-00-49-89-636123-X,LROUTE=300,LAUTH=1;
  ```

  Internal availability via ISDN station numbers is now ensured.

- Configuring outdial rules

  As every source group uses different trunks for CO breakout, each source group requires separate LCR routes. As the outdial rules are usually the same for all LROUTES, it makes sense to share their usage.

  We have defined that we want to use LCR routes 400-499 for international destinations and routes 500-599 for national destinations.

  In the description that follows, we will use the numbers 400 and 500 for the general outdial rules and the LROUTES 4xx and 5xx for the LCR routes (xx

represents the source group. This results in the LROUTE numbers 401 to 599).

Defining the required outdial rules:

– Outdial rule 400 will be the general outdial rule for sending an explicit international E.164 station number.
– Outdial rule 500 will be the general outdial rule for sending an explicit national station number, which is necessary for destinations within the local country.

Additional information on assigning outdial rules:

If other provisions apply for particular carriers or countries, the corresponding outdial rules 3xx and 4xx are kept free to enable the relevant outdial rules to be used for national and international station numbers.

– Configuring an outdial rule for **international dialing**:

```
ADD-LODR:ODR=400,CMD=ECHO,FIELD=4;
ADD-LODR:ODR=400,CMD=ECHOALL;
ADD-LODR:ODR=400,CMD=NPI,NPI=ISDN,TON=INTERNAT;
ADD-LODR:ODR=400,CMD=END;
ADD-LODR:ODR=400,INFO="LODR INTERNATIONAL";
```

– Configuring the outdial rule for **national dialing**:

```
ADD-LODR:ODR=500,CMD=ECHO,FIELD=5;

ADD-LODR:ODR=500,CMD=ECHOALL;

ADD-LODR:ODR=500,CMD=NPI,NPI=ISDN,TON=NATIONAL;

ADD-LODR:ODR=500,CMD=END;

ADD-LODR:ODR=500,INFO="LODR NATIONAL for INTERNATIONAL
 NUMBERS";
```

• Configuring LCR routes:

– LRTE numbers 4xx (401 to 499) are used for connections to external international destinations.

```
ADD-RICHT:MODE=LRTENEW,LRTE=401,LSVC=ALL,,
NAME="SRC01 INTERNAT",TGRP=5,DNNO=1-1-195;

ADD-RICHT:MODE=LRTENEW,LRTE=402,LSVC=ALL,,
NAME="SRC02 INTERNAT",TGRP=8,DNNO=1-1-198;

ADD-RICHT:MODE=LRTENEW,LRTE=417,LSVC=ALL,,
NAME="SRC17 INTERNAT",TGRP=6,DNNO=1-1-196;

ADD-RICHT:MODE=LRTENEW,LRTE=426,LSVC=ALL,,
NAME="SRC26 INTERNAT",TGRP=7,DNNO=1-1-197;
```

– The subscriber's own trunk group is seized directly and the international station number (LODR 400) is transmitted.

```
ADD-LDAT:LROUTE=401,TGRP=5,ODR=400,LAUTH=1;

ADD-LDAT:LROUTE=402,TGRP=8,ODR=400,LAUTH=1;
```

```
ADD-LDAT:LROUTE=417,TGRP=6,ODR=400,LAUTH=1;

ADD-LDAT:LROUTE=426,TGRP=7,ODR=400,LAUTH=1;
```

– The 5xx LRTE numbers (501 to 599) are used for connections to external national destinations.

```
ADD-RICHT:MODE=LRTENEW,LRTE=501,LSVC=ALL,
NAME="SRC01 INLAND",TGRP=5,DNNO=1-1-195;

ADD-RICHT:MODE=LRTENEW,LRTE=502,LSVC=ALL,,
NAME="SRC02 INLAND",TGRP=8,DNNO=1-1-198;

ADD-RICHT:MODE=LRTENEW,LRTE=517,LSVC=ALL,,
NAME="SRC17 INLAND",TGRP=6,DNNO=1-1-196;

ADD-RICHT:MODE=LRTENEW,LRTE=526,LSVC=ALL,,
NAME="SRC26 INLAND",TGRP=7,DNNO=1-1-197;
```

– The subscriber's own trunk group is seized directly and the national station number (LODR 500) is transmitted.

```
ADD-LDAT:LROUTE=501,TGRP=5,ODR=500,LAUTH=1;

ADD-LDAT:LROUTE=502,TGRP=8,ODR=500,LAUTH=1;

ADD-LDAT:LROUTE=517,TGRP=6,ODR=500,LAUTH=1;

ADD-LDAT:LROUTE=526,TGRP=7,ODR=500,LAUTH=1;
```

Once the LCR routes have been configured, these are assigned to the LCR profiles.

• Configuring the LCR profile

The simplest LCR profile is for connections to countries in which there is no separate CO breakout, but rather just general international breakout.

As LCR profiles 1 and 2 have already been used for general modification in LCR level 1, we will use LCR profile 3 for the general international breakout, and assign this profile the corresponding 4xx LRTE numbers:

```
ADD-LPROF:PROFNAME="INTERNAT DIRECT",SRCGRP=1,
LRTE=401,PROFIDX=3;

CHANGE-LPROF:PROFIDX=3,SRCGRP=2,LRTE=402;

CHANGE-LPROF:PROFIDX=3,SRCGRP=17,LRTE=417;

CHANGE-LPROF:PROFIDX=3,SRCGRP=26,LRTE=426;
```

For every country where CO breakout is available, an additional LCR profile is required for national destinations. As we have defined that CO breakout should always be performed from the local CO, a separate LCR profile

is required for every destination country for this purpose, comprising an individual combination of national and international LCR routes.

Our example only includes breakouts in Germany. As a result, we require an LCR profile with uniform national destinations:

LCR profile 4 is for external destinations in Germany (LRTE 5xx for direct breakout to the national network):

```
ADD-LPROF:PROFNAME="CO
 GERMANY",SRCGRP=1,LRTE=501,PROFIDX=4;

CHANGE-LPROF:PROFIDX=4,SRCGRP=2,LRTE=502;

CHANGE-LPROF:PROFIDX=4,SRCGRP=17,LRTE=517;

CHANGE-LPROF:PROFIDX=4,SRCGRP=26,LRTE=526;
```

5.36.3.3.7 Future Expansions

1) If another virtual node were to be added in Germany, the following additional measures would be required:

- Configure the virtual node number as **OWNNODE**.
- If the station numbers do not correspond to an existing DPLN group, you may need to configure a new DPLN group.
- The new virtual node must be configured with the AMO KNDEF.
- The new subscribers must be configured.
- The subscribers must then be assigned the LCR profile if this is not already specified by the hardware configuration.
- Configure the trunk group with the trunks for this node.
- Expansion of LCR level 1:
  - For every new city, a new outdial rule must be configured with the number 1xx for Hamburg.
  - This outdial rule must be configured for the LCR route with the number of the outdial rule as the LRTE number.
  - The new LRTE must be assigned LCR profile 1.
  - In addition, LCR profile 2 (Germany) must be expanded to include new source groups.
- Expansion of LCR level 2:
  - A new LTRE must be configured for this source group for all LCR routes from LTRE 3xx onwards (in our example LTRE 3xx to 6xx).
  - Existing LCR profiles greater than or equal to 3 (3 to 5 in our example) must be expanded to include the new source group.
  - The new station number must be assigned LCR profile 4 for internal destinations in Germany.

  Example:

  The system is expanded to include an IPDA shelf in the Reperbahn district. The AP is assigned the LTU number 40. Accordingly, it is assigned source group 40. The virtual node number is 1-1-4 with the node code 94. The ISDN station number is +49 40 2889 – X.

  ```
  ADD-WABE:CD=94,DAR=OWNNODE,CHECK=N;

  ADD-KNDEF:NNO=1-1-4,TYPE=OWN, ISDNCC=49,ISDNAC=40,
  ```

```
ISDNLC=2889,ISDNSK=4,
 NODECD=94,NODECDSK=2,DPLN=2,ADPLN=2;

ADD-SBCSU:STNO=941007,OPT=OPTI,CONN=DIR, PEN=1-40-3-0,
DVCFIG=OPTIIP,COS1=1,COS2=1,LCOSV1=1,
 LCOSV2=1,LCOSD1=1,LCOSD2=1;

(CHANGE-
SDAT:STNO=941000&&941999,TYPE=DATA1,SRCGRP=40;)

ADD-BUEND:TGRP=4,NAME="TRUNK GROUP ND 1-1-4",NO=30;

ADD-
TDCSU:OPT=NEW,PEN=1-40-1-0,COTNO=20,COPNO=20,DPLN=0,ITR=0,COS
LCOSV=1,LCOSD=1,CCT="CO Hamburg 194",
 DESTNO=99,PROTVAR=EDSGER,SEGMENT=1,
ATNTYP=CO,ISDNIP=00,ISDNNP=0,TRACOUNT=8,NNO=1-1-194,TGRP=4,SP
INS=Y,DEV=S2COD,BCHAN=1&&30,BCNEG=Y,BCGR=1,LWPAR=1,
 SRCGRP=40;

ADD-LODR:ODR=103,CMD=OUTPULSE,DGTS=0004940;

ADD-LODR:ODR=103,CMD=ECHO,FIELD=3;

ADD-LODR:ODR=103,CMD=NPI,NPI=ISDN,TON=INTERNAT;

ADD-LODR:ODR=103,CMD=END;

ADD-LODR:ODR=103,INFO="LODR FOR Hamburg";

ADD-RICHT:MODE=LRTENEW,LRTE= 103,LSVC=ALL,NAME="SRC
 Hamburg",
TGRP=4,DNNO=1-1-194;

ADD-LDAT:LROUTE=103,TGRP=
 4,ODR=103,LAUTH=1,LATTR=RERTEINT;

CHANGE-LPROF:PROFIDX=1,SRCGRP=40,LRTE=103;

CHANGE-LPROF:PROFIDX=2,SRCGRP=40,LRTE=200;

ADD-RICHT:MODE=LRTENEW,LRTE=340,LSVC=ALL,,
NAME="SRC40 INTERNAT",TGRP=4,DNNO=1-1-194;

ADD-LDAT:LROUTE=340,TGRP=4,ODR=300,LAUTH=1;

ADD-RICHT:MODE=LRTENEW,LRTE=440,LSVC=ALL,NAME="SRC40
 INLAND",
TGRP=4,DNNO=1-1-194;

ADD-LDAT:LROUTE=440,TGRP=4,ODR=400,LAUTH=1;

ADD-RICHT:MODE=LRTENEW,LRTE=540,LSVC=ALL,NAME="SRC40
 RERT INT",
TGRP=4,DNNO=1-1-194;
```

```
ADD-LDAT:LROUTE=540,TGRP=
 4,ODR=300,LAUTH=1,LATTR=RERTEINT;

ADD-LDAT:LROUTE=540,TGRP=4,ODR=300,LAUTH=1;

ADD-RICHT:MODE=LRTENEW,LRTE=640,LSVC=ALL,NAME="SRC40
 RERT NAT",
TGRP=4,DNNO=1-1-194;

ADD-LDAT:LROUTE=640,TGRP=
 4,ODR=300,LAUTH=1,LATTR=RERTEINT;

ADD-LDAT:LROUTE=640,TGRP=4,ODR=400,LAUTH=1;

CHANGE-LPROF:PROFIDX=3,SRCGRP=40,LRTE=340;

CHANGE-LPROF:PROFIDX=4,SRCGRP=40,LRTE=640;

CHANGE-LPROF:PROFIDX=5,SRCGRP=40,LRTE=440;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LAUTH=1,
LDP=0-W-00-49-40-2889-X,PROFIDX=4;
```

2) If another virtual node were to be added in a new country, for example Austria, then the following measures are required:

- Configure the virtual node number as **OWNNODE**.
- If the station numbers do not correspond to an existing DPLN group, you may need to configure a new DPLN group. (In our example we expand the DPLN to include five-digit station numbers.)
- The new virtual node must be configured with the AMO KNDEF.
- The new subscribers must be configured.
- The subscribers must then be assigned the LCR profile if this is not already specified by the hardware configuration. (In our example,

two source groups are required because the location is large and is distributed over 2 APs.)

- Configure the trunk group with the trunks for this node.
- Expansion of LCR level 1:
  - For every new city, a new outdial rule must be configured with the number 1xx for the company in Austria.
  - This outdial rule must be assigned to the LCR route with the LRTE number of the outdial rule.
  - The new LRTE must be assigned to LCR profile 1 for both source groups.
  - A new outdial rule with the number 2xx must be configured for the new country, Austria.
  - This outdial rule should be assigned to the LCR route with the LRTE number of the outdial rule.
  - The new LRTE is to be assigned to LCR profile 2 with both source groups.
- Expansion of LCR level 2:
  - A new LTRE must be configured for this source group for all LCR routes from LTRE 3xx onwards (in our example LTRE 3xx to 6xx).
  - Existing LCR profiles greater than or equal to 3 (3 to 5 in our example) must be expanded to include the new source group.
  - Two new LCR profiles must be configured for the destination Austria, Profile 6 for reroute internal and Profile 7 for direct breakout to the central office.
  - The new station number must be assigned LCR profile 6 for internal destinations in Germany.
  - External station numbers in Austria must be assigned LCR profile 7.

  Example:

  The system is expanded to include two IPDA shelves at the Prater site. The APs are assigned the LTU numbers 42 and 43. This is why they are assigned source groups 42 and 43. The virtual node number is 1-1-3 with the node code 93. The ISDN station number is +43 5 1707 – X.

```
ADD-WABE:CD=93,DAR=OWNNODE,CHECK=N;

ADD-WABE:CD=20000&&39999,DPLN=3,DAR=STN;

ADD-KNDEF:NNO=1-1-3,TYPE=OWN,
 ISDNCC=43,ISDNAC=5,ISDNLC=1707,
ISDNSK=4, NODECD=93,NODECDSK=2,DPLN=3,ADPLN=3;

ADD-SBCSU:STNO=9420100,OPT=OPTI,CONN=DIR,
 PEN=1-42-3-0,DVCFIG=OPTIIP,
COS1=1,COS2=1,LCOSV1=1,
 LCOSV2=1,LCOSD1=1,LCOSD2=1,DPLN=3;

ADD-SBCSU:STNO=9430100,OPT=OPTI,CONN=DIR,
 PEN=1-43-3-0,DVCFIG=OPTIIP,
COS1=1,COS2=1,LCOSV1=1,
 LCOSV2=1,LCOSD1=1,LCOSD2=1,DPLN=3;
```

```
CHANGE SDAT is omitted because in this case the source
 group is already
assigned to the PEN via the AMO UCSU. Luckily, neither
 of the APs contains an
additional virtual node :-)

ADD-BUEND:TGRP=2,NAME="BDL AP42 KN1-1-3",NO=30; ADD-
BUEND:TGRP=3,
NAME="BDL AP43 KN1-1-3",NO=30;

ADD-
TDCSU:OPT=NEW,PEN=1-42-1-0,COTNO=20,COPNO=20,DPLN=0,ITR=0,COS=1,L
LCOSD=1,CCT="CO Vienna
 192",DESTNO=92,PROTVAR=EDSAUT,SEGMENT=1,ATNTYP=CO,ISDNIP=00,
ISDNNP=0,TRACOUNT=8,NNO=1-1-192,TGRP=2,SRCHMODE=ASC,INS=Y,DEV=S2C
BCNEG=Y,BCGR=1,LWPAR=1, SRCGRP=42;

ADD-
TDCSU:OPT=NEW,PEN=1-43-1-0,COTNO=20,COPNO=20,DPLN=0,ITR=0,COS=1,L
LCOSD=1,CCT="CO Vienna
 193",DESTNO=93,PROTVAR=EDSAUT,SEGMENT=1,ATNTYP=CO,
ISDNIP=00,ISDNNP=0,TRACOUNT=8,NNO=1-1-193,TGRP=3,SRCHMODE=ASC,INS
BCHAN=1&&30,BCNEG=Y,BCGR=1,LWPAR=1, SRCGRP=43;

ADD-LODR:ODR=104,CMD=OUTPULSE,DGTS=000435;
ADD-LODR:ODR=104,CMD=ECHO,FIELD=3;
ADD-LODR:ODR=104,CMD=NPI,NPI=ISDN,TON=INTERNAT;
ADD-LODR:ODR=104,CMD=END; ADD-LODR:ODR=104,INFO="LODR
 for Company in Austria";

ADD-RICHT:MODE=LRTENEW,LRTE= 104,LSVC=ALL, NAME="SRC
 Company in Austria",TGRP=3,DNNO=1-1-193;

ADD-LDAT:LROUTE=104,TGRP=
 3,ODR=104,LAUTH=1,LATTR=RERTEINT;

CHANGE-LPROF:PROFIDX=1,SRCGRP=42,LRTE=104;
CHANGE-LPROF:PROFIDX=1,SRCGRP=43,LRTE=104;
ADD-LODR:ODR=201,CMD=OUTPULSE,DGTS=00043;
ADD-LODR:ODR=201,CMD=ECHO,FIELD=3;
ADD-LODR:ODR=201,CMD=NPI,NPI=ISDN,TON=INTERNAT;
ADD-LODR:ODR=201,CMD=END; ADD-LODR:ODR=201,INFO="LODR
 FOR Austria";
ADD-RICHT:MODE=LRTENEW,LRTE= 201,LSVC=ALL,
 NAME="Austria",TGRP=3,DNNO=1-1-193;
ADD-LDAT:LROUTE=201,TGRP=
 3,ODR=201,LAUTH=1,LATTR=RERTEINT;

CHANGE-LPROF:PROFIDX=1,SRCGRP=42,LRTE=201;
CHANGE-LPROF:PROFIDX=1,SRCGRP=43,LRTE=201;

ADD-RICHT:MODE=LRTENEW,LRTE=342,LSVC=ALL,NAME="SRC42
 INTERNAT",TGRP=2,DNNO=1-1-192;
ADD-RICHT:MODE=LRTENEW,LRTE=343,LSVC=ALL,NAME="SRC43
 INTERNAT",TGRP=3,DNNO=1-1-193;
```

```
ADD-LDAT:LROUTE=342,TGRP=2,ODR=300,LAUTH=1; ADD-
LDAT:LROUTE=343,TGRP=3,ODR=300,LAUTH=1;
ADD-RICHT:MODE=LRTENEW,LRTE=442,LSVC=ALL, ,NAME="SRC42
 INLAND",TGRP=2,DNNO=1-1-192;
ADD-RICHT:MODE=LRTENEW,LRTE=443,LSVC=ALL,,NAME="SRC43
 INLAND",TGRP=3,DNNO=1-1-193;

ADD-LDAT:LROUTE=442,TGRP=2,ODR=400,LAUTH=1; ADD-
LDAT:LROUTE=443,TGRP=3,ODR=400,LAUTH=1;

ADD-RICHT:MODE=LRTENEW,LRTE=542,LSVC=ALL,NAME="SRC42
 RERT INT",TGRP=2,DNNO=1-1-192;
ADD-RICHT:MODE=LRTENEW,LRTE=543,LSVC=ALL,NAME="SRC43
 RERT INT",TGRP=3,DNNO=1-1-193;

ADD-LDAT:LROUTE=542,TGRP=
 2,ODR=300,LAUTH=1,LATTR=RERTEINT;
ADD-LDAT:LROUTE=542,TGRP=2,ODR=300,LAUTH=1;
ADD-LDAT:LROUTE=543,TGRP=
 3,ODR=300,LAUTH=1,LATTR=RERTEINT;
ADD-LDAT:LROUTE=543,TGRP=3,ODR=300,LAUTH=1;

ADD-RICHT:MODE=LRTENEW,LRTE=642,LSVC=ALL,NAME="SRC42
 RERT NAT",TGRP= 2,DNNO=1-1-192;
ADD-RICHT:MODE=LRTENEW,LRTE=643,LSVC=ALL,NAME="SRC43
 RERT NAT",TGRP=3,DNNO=1-1-193;

ADD-LDAT:LROUTE=642,TGRP=
 2,ODR=300,LAUTH=1,LATTR=RERTEINT;
ADD-LDAT:LROUTE=642,TGRP=2,ODR=400,LAUTH=1;
ADD-LDAT:LROUTE=643,TGRP=
 3,ODR=300,LAUTH=1,LATTR=RERTEINT;
ADD-LDAT:LROUTE=643,TGRP=3,ODR=400,LAUTH=1;

CHANGE-LPROF:PROFIDX=3,SRCGRP=42,LRTE=342;
CHANGE-LPROF:PROFIDX=3,SRCGRP=43,LRTE=343;
CHANGE-LPROF:PROFIDX=4,SRCGRP=42,LRTE=542;
CHANGE-LPROF:PROFIDX=4,SRCGRP=43,LRTE=542;
CHANGE-LPROF:PROFIDX=5,SRCGRP=42,LRTE=342;
CHANGE-LPROF:PROFIDX=5,SRCGRP=43,LRTE=343;

ADD-LPROF:PROFNAME="RERT AUSTRIA", SRCGRP=1,LRTE=
 501,PROFIDX=6;
CHANGE-LPROF:PROFIDX=6,SRCGRP=2,LRTE=502; CHANGE-
LPROF:PROFIDX=6,SRCGRP=17,LRTE=517;
CHANGE-LPROF:PROFIDX=6,SRCGRP=26,LRTE=526; CHANGE-
LPROF:PROFIDX=6,SRCGRP=40,LRTE=540;
CHANGE-LPROF:PROFIDX=6,SRCGRP=42,LRTE=642; CHANGE-
LPROF:PROFIDX=6,SRCGRP=43,LRTE=643;

ADD-LPROF:PROFNAME="CO AUSTRIA", SRCGRP=1,LRTE=
 301,PROFIDX=7;
CHANGE-LPROF:PROFIDX=7,SRCGRP=2,LRTE=302; CHANGE-
LPROF:PROFIDX=7,SRCGRP=17,LRTE=317;
CHANGE-LPROF:PROFIDX=7,SRCGRP=26,LRTE=326; CHANGE-
LPROF:PROFIDX=7,SRCGRP=40,LRTE=340;
```

```
CHANGE-LPROF:PROFIDX=7,SRCGRP=42,LRTE=442; CHANGE-
LPROF:PROFIDX=7,SRCGRP=43,LRTE=443;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LAUTH=1, LDP=0-
W-00-43-5-1707-X,PROFIDX=6;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LAUTH=1, LDP=0-
W-00-43-X,PROFIDX=7;
```

A separate description will be created for the topic of networking.

5.36.3.4 Connecting External Systems

If an external system or carrier is unable to send the called party number as a subscriber, national or international station number, then the corresponding trunk must be assigned to a virtual node with the AMO TDCSU parameter VNNO. The stations in this node will then be reached by this trunk with the station number. Stations in other virtual nodes can be reached by this trunk by dialing the node code + station.

```
ADD-TDCSU:OPT=NEW,PEN=1-1-1-1,COTNO=20,COPNO=20,DPLN=0,
ITR=0,COS=1,LCOSV=1,LCOSD=1,CCT="S2 CO",DESTNO=99,
PROTVAR=EDSGER,SEGMENT=1,ATNTYP=CO,ISDNIP=00,ISDNNP=0,
TRACOUNT=8,NNO=1-1-199,TGRP=1,SRCHMODE=ASC,INS=Y,DEV=S2COD,
BCHAN=1&&30,BCNEG=Y,BCGR=1,LWPAR=1,VNNO=1-1-95;
```

5.36.4 OpenScape 4000 Manager

5.36.4.1 Configuration

VNR cannot be activated from CM. The feature can only be activated using the parameter **VNR** in the AMO ZANDE (see Command for feature activation). The value of the corresponding flag is shown in CM. However, this cannot be administrated from CM.

VNR mode not activated

If VNR is not activated only unique station numbers with a maximum of 6 digits are accepted. The numbers must be independent of the DPLN; similar numbers will not be accepted. Virtual nodes are also independent of the DPLN.

VNR mode activated

If you wish to switch to the mode "VNR activated", you must execute the AMO ZANDE and set the VNR flag to YES. In CM, the display of station numbers is taken from the AMO.

If the user activates the global flag in a particular OpenScape 4000, the display of the relevant station numbers in the OpenScape 4000 Manager database is no longer applicable. The display in the Manager/Assistant depends strongly on the display in the AMO. If the display in the system changes, an upload with the new displayed numbers must be performed without delay in OpenScape

4000 Manager/Assistant. Following modification to the VNR flag, **Upload All** must be implemented. With **Upload All**, all station numbers are returned as 12-digit numbers including the access code of the virtual node (VNAC). In CM, the display of all station numbers loaded by the relevant system is adapted. DPLN-dependent virtual nodes can be configured; identical and similar numbers are permitted.

With the current implementation, routing cannot be correctly performed when systems with and without VNR are operated in one domain. However, there are current scenarios that support this option.

As the current Manager implementation only supports routing in domains where VNR is either globally activated or globally deactivated, new V4 systems where VNR is activated should be assigned to a separate domain.

Customers can continue to enter abbreviated numbers when configuring station numbers. During saving, the numbers are then automatically extended. Once saving has been successfully completed, the numbers are shown in full.

5.36.4.2 Modifying the User Interface

5.36.4.2.1 "System" Window

Call up via **Configuration Management > Network > System**

Changes in this dialog:

- New flag **VNR Active**

As it is not possible to administrate the global flag from the AMO ZANDE via CM, the user cannot modify the status of the checkbox.

5.36.4.2.2 "Station" Window

Call up via **Configuration Management > Station > Station**

There are four changes in this dialog.

- **Station No.** has been extended so that station numbers with 12 digits can now be displayed.
- The flag **VNR Active** was added. This flag cannot be edited and is displayed for information purposes only.
- The access code for the virtual node (VNAC) is displayed directly next to the field **Virtual Node ID**.
- The field **DPLN Group** (tab page **Base 1**) was added.

Configuring a new station in a system with VNR

- Using the virtual node assigned as standard

  When configuring a new station, the user does not need to specify a **Virtual Node ID**. This is an optional input parameter. If the user does not input any information, the virtual node assigned as standard is used for the station in question. The standard node for the relevant system is the virtual node for which the **Default Entry** checkbox is selected in the "Virtual Nodes (KNDEF)" Window.

  The **Virtual node ID** is in fact a mandatory parameter that is automatically filled when the user does not input specific information.

- Using the standard DPLN group of a virtual node

  Standard DPLN group usage is similar to that of the virtual node assigned as standard. A DPLN group must be declared as standard for every virtual node.

  If the user leaves the field for the DPLN group entry empty, this is automatically filled with the value of the standard DPLN group for the selected virtual node.

5.36.4.2.3 "Virtual Nodes (KNDEF)" Window

Call up via **Configuration Management > Network > Virtual Nodes (KNDEF)**

Configuring a new virtual node

Situation up until now: Virtual nodes are not DPLN-dependent.

With the VNR feature it is now possible to configure DPLN groups in virtual nodes.

The user can configure a new virtual node as DPLN-dependent by deactivating the corresponding checkboxes for particular DPLN groups. A standard DPLN group must then be selected. In the selection list for the standard DPLN group, all authorized DPLN groups are offered.

Forwarding information to virtual nodes

In the **Virtual Nodes (KNDEF)** dialog, data regarding the selected virtual node can be forwarded to other systems in the same domain or to all systems in the network. With this new function, users can correctly configure virtual nodes. When correctly configured, a virtual node will have the same access code (VNAC) in all systems.

As the access code for virtual nodes (VNAC) cannot be modified for systems where VNR is activated, the forwarding function can only be used when configuring new virtual nodes.

5.36.4.2.4 Station Relocation

IMPORTANT: Stations can only be relocated to another system at the same virtual node.

Relocation is not permitted if the same virtual node as in the source system is not configured in the destination system. OpenScape 4000 Manager CM does not configure virtual nodes in the background during relocation. As a result, users cannot modify the virtual **Node Access Code** when relocating to another system.

Modification of the virtual **Node Access Code** must be performed in a separate step or after relocation has been completed.

5.36.5 AMO Interrelationships

5.36.5.1 Attendant Console Groups

5.36.5.1.1 Feature Description

Even if the VNR feature is activated, all attendant consoles/attendant console groups for each node should be available under the same number.

The access code for incoming trunk calls (ATND) and attendant code (MEL) for internal calls are configured on a node-dependent basis, as are the personal station numbers of the attendant consoles. In the same way as with VNR stations, the same codes can therefore also be used in multiple virtual nodes.

If, for example, attendant console groups distributed across several physical nodes (OpenScape 4000 systems) are moved to one physical and several virtual nodes, the attendant console groups can retain their codes, but will be addressed uniquely via the node code of the virtual node and the existing codes of the attendant console group.

IMPORTANT: If VNR is activated, attendant console groups and attendant consoles can only be uniquely reached with the node code of the virtual node where the codes are configured.

5.36.5.1.2 Example

OpenScape 4000 is located in Munich and AP in Hamburg. One attendant console group each is configured at both locations with the same codes (access code 0 for calls from the central office and attendant code 900 for internal calls).

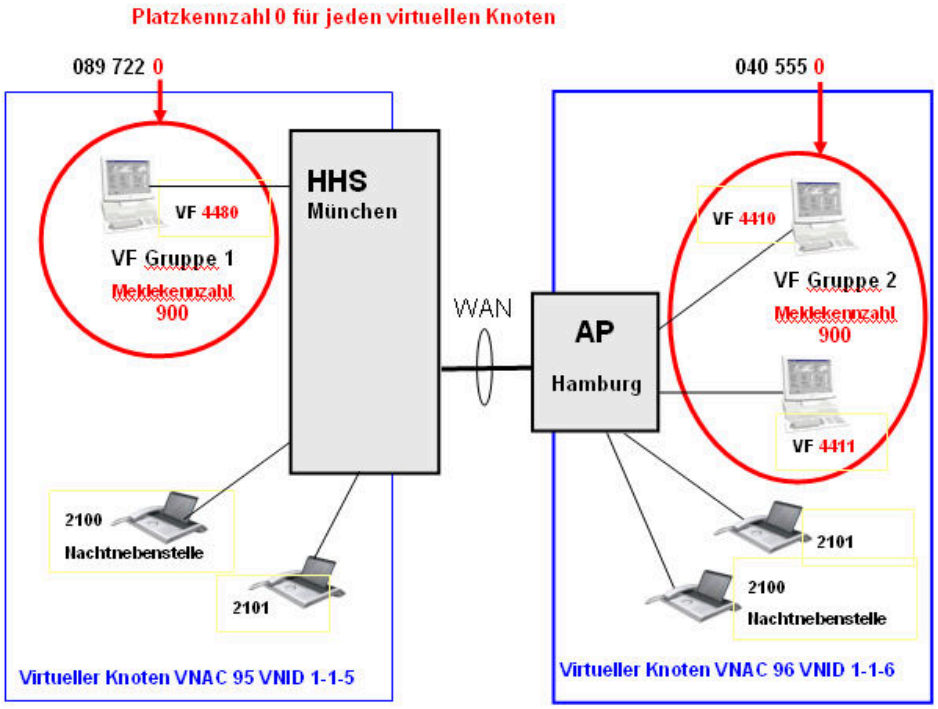


Figure 77: Attendant console groups with VNR

Availability of attendant consoles/attendant console groups

- From the CO with the relevant E.164 station number in accordance with the virtual node and access code (Example: As shown in the diagram, 089 722 0 to the Munich AC group or 040 555 0 to the AC group in Hamburg).

- Stations at the OpenScape 4000 or the AP reach the AC group belonging to the local virtual node via the attendant code without the node code (900). They reach the AC group belonging to another virtual node by dialing the node code and attendant code (from Munich to Hamburg e.g. 96 900)
- Stations at the OpenScape 4000 or the AP reach the attendant console belonging to the local virtual node via their own station number without the node code (4480). They reach an attendant console belonging to another virtual node by dialing the node code and their own station number (from Munich to Hamburg e.g. 96 4410)

Administration for the application example

- Configuring the station numbers in the DPLN
```
DAR = ATND (900)
 DAR = ATND (0)
 DAR = VPI (4410,4411,4480)
 (DAR = GENANS)
```
- Configuring the attendant consoles in the AMO ACSU
```
ADD-ACSU:ATNDNO=954480,...;
 ADD-ACSU:ATNDNO=964410,...;
 ADD-ACSU:ATNDNO=964411,...;
```
- Configuring the night options
```
ADD-NAVAR:NOPTNO=1,TYPE=STN,STNO=952100;
 ADD-NAVAR:NOPTNO=2,TYPE=STN,STNO=962100;
 ADD-NAVAR:NOPTNO=3,TYPE=CASINT,ATNDGR=2;
 ADD-NAVAR:NOPTNO=4,TYPE=CASINT,ATNDGR=1;
```
- Configuring the attendant console groups
```
ADD-VFGR:ATNDGR=1,QUEMODE=DW,ATNDNO=954480,....;
 ADD-VFGR:ATNDGR=2,QUEMODE=DW,ATNDNO=964410&964411,....;
```
- Configuring the code - group assignments
```
ADD-VFGKZ:TYPE=ATNDGR,CD=950,CPS=6,ATNDGR=1;
 ADD-VFGKZ:TYPE=ATNDGR,CD=960,CPS=6,ATNDGR=2;
 ADD-VFGKZ:TYPE=ATNDGR,CD=95900,CPS=5,ATNDGR=1;
 ADD-VFGKZ:TYPE=ATNDGR,CD=96900,CPS=5,ATNDGR=2;
```

5.36.5.2 VNR with Code Calling/Multiple Code Calling (CC/MCC)

In a OpenScape 4000 that is divided into several virtual nodes, there is one central MCC configuration and thus just one central MCC search table.

Consequently, the station number entries must be unique, which means they must be entered with the node code.

The same applies for the administration of the station number/code-calling number evaluation table in the AMO PERSI for station number entry. The original limitation of the station number length to six characters was extended to twelve.

A user can basically select either an MCC paging job or an MCC callback job with or without node code. The relevant virtual node code is automatically added for the selected station number depending on the PEN of the user (virtual node or HHS).

If the paging party is in the same virtual node as the paged party, node codes are not displayed; the node code is displayed if the parties are in different virtual nodes.

Call forwarding to MCC can only be programmed over the menu by entering the MCC code. The associated station number is automatically generated (always with the node code).

If MEETME is set as the operating mode, the paging job can also be extended to include the A BLOCK (paging party's station number). This is done by assigning a length to the MABLK parameter in TSCSU. The station number is generated following VNR rules within this length specification.

If the paging and paged parties are in the same virtual node, then generation takes place without a node code. If the paging and paged parties are in different virtual nodes, then generation takes place with the node code.

Another parameter specifies at which end the station number generated should be truncated if it exceeds the preset length setting.

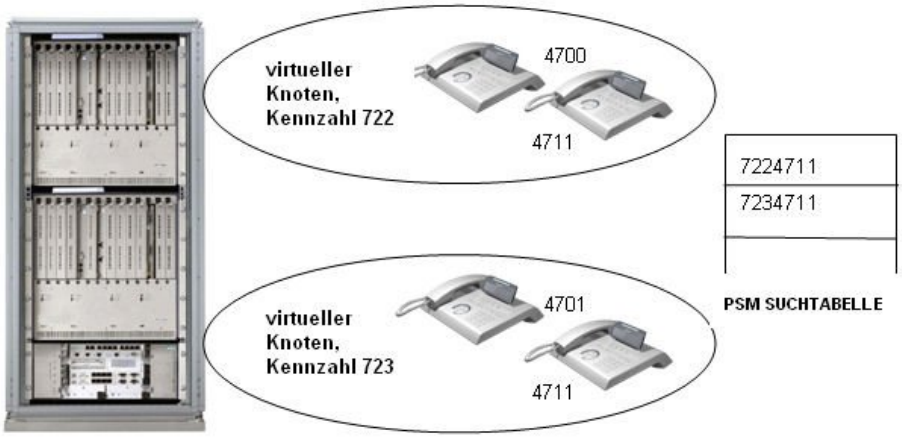
In DISPLAY mode, the paging job consists of the paged party's station number. Here again, the station number is generated with or without the node code depending on the PENs of the paging and paged parties.

If you set "Long code-calling number > 0", the MCC operates without digit analysis for the code-calling number which means VNR interaction is not performed for it.

The same rules apply for CC.

GUI impact

- The station number/code-calling number table is always administered with station number + node code. In contrast to the station number, the code-calling number remains restricted to a maximum of six digits.
- Paging and callback jobs within a virtual node continue to omit the node code.
- The node code must always be entered for paging and callback jobs across virtual nodes.
- The format of the paging job issued and the paging display always depends on virtual node assignment for the paging and paged parties.



Scenario:

STN 4711 from virtual node 722 is paged and appears in the search table with node code 722.

STN 4711 from virtual node 723 is paged and appears in the search table with node code 723.

- STN 4700 can register on STN 7224711 without dialing the node code
- STN 4700 can only register on STN 7234711 when the node code is dialed
- STN 4701 can only register on STN 7224711 when the node code is dialed
- STN 4701 can register on STN 7234711 without dialing the node code

5.36.5.3 VNR with Alternate Routing on Error (ARoE)

The parts of ARoE that have relevance for VNR include scenarios for AP Emergency or HFA Alternate Logon.

In these cases, there is usually an entire group of stations from specific areas (APs) in a OpenScape 4000 that cannot be reached.

To avoid having to configure alternative station numbers for each individual station (storage space), you can use the AMO APRT to configure a partially qualified alternative station number for an entire source group and then append this number with the station number you want to use.

This number appended always includes the node code.

When performing administration with the AMO APRT, ensure that the parameter that defines the maximum length of the station number you want to expand is sufficiently large so as to accommodate the length of station numbers and virtual node numbers in the case of different station number lengths.

OpenScape 4000 supports length specifications that exceed the actual station number generated. If the station number generated exceeds the length specified, this number is truncated from the left.

You can use this mechanism when an HFA telephone tries by mistake to log on to a non-NUN node in which its station number is configured without node code.

GUI impact

- Consider VNR relevance when configuring the alternate routing number with APRT or SDAT.
- If the alternate routing number is configured as partially qualified (only possible with the AMO APRT), you should specify a length that will accommodate the station number to be generated.
- If the alternate routing number is completely configured, check whether it must be administered with the node code.

5.36.5.4 Applications

The following applications and tools are available with this feature in the versions listed:

OpenScape 4000		
Application/Tool	Version	Status
CMI/CATool	?	?
Gateways (CGW) + Admin	LW line 11 or 21	Tests conducted in system test.

IPDA access points (AP)	LW line 11 or 21	Tests conducted in system test.
QDC	?	Testsâ with V4 without VNR OK
QCU	?	Testsâ with V4 without VNR OK
HOT => (PCDACON ?)	V4.0 (PCDACON open)	No test in system test
Applications		
Application/Tool	Version	Status
CAP (Common Application Platform)	V3.0 SMR 5 6.0	Tests with VNR OK
BLF (Busy Lamp Field application)	V3.0	Tests with VNR scheduled for E03/07
AC-WIN (Attendant Console)	V5.0/MQ v3.0	Tests with VNR OK
DS-WIN	V3.0	Tests with VNR scheduled for E03/07
DTB (Display Telephone Book)	---	Does not support VNR!!!
ASC (Attendant Supervisor Console)	V5.0	Tests with VNR scheduled for E03/07
Com Assistant	V2.0	Operates in FT with V4.0 without VNR
Simply Phone	V4.0	Simply Phone for Web V3.1 does not work with CAP V3.0 and consequently was not tested. Simply Phone for Outlook/Lotus Notes tested without VNR.
Xpressions 470	V4.0/V5	Tests without VNR with V4 OK
Pro Center	V7.0	Request sent to Trango, no answer yet
Teleworking (HiPath Corporate Connect)	V2.6 does not run with VNR	No test because status is M5
Hospitality	V2.0/V2.1	Tests with VNR scheduled for E04/07
OpenScape Agile	V2.0	No test required according to Mr. Paschdeka

DAKS		Not available in the system test, operates in int. FT without VNR
OpenScape 4000 Management Applications (Manager & Assistant)		
Application/Tool	Version	Status
CM (Configuration Management)	?	?
COL	V2.0	Tests with VNR scheduled
PM (Performance Management)	V2.0	Tests with VNR scheduled
SNMP	?	?
TSKA	?	?
RDS	?	?
ACL Tracer	?	?
OpenScape Management Applications		
Application/Tool	Version	Status
UM (User Management)	V2.0	Tests with VNR scheduled for E03/07
AM (Accounting Management)	V2.0	Tests with VNR scheduled for E03/07
FM (Fault Management)	V3.0	Tests with VNR scheduled for E03/07
QM (Quality of Service Management)	V1.0	Tests with VNR scheduled for E03/07
DLS (Deployment Service)	?	No tests yet, tests with SPE
Endpoints		
Application/Tool	Version	Status
Analog phones	?	Tests with VNR OK
TDM phones	?	Tests with VNR OK
IP phones HFA	V5.1	Tests with VNR OK
IP phones SIP	V6.0	Tests with VNR OK
CMI phones	V3.0	Tests with VNR OK
WLAN IP phones	V1.0	Tests with V4.0 OK (without active VNR)

optiClients	V5.1 HFA/V4.0 SIP	Tests with VNR OK

NOTICE: Starting with 2020, all former Windows versions will not be supported as operating systems for the following applications: **CAP V3 latest SMR**, **AC-WIN V3**, **BLF Server**, **DS-Win**. The Windows versions that are currently supported are: Windows 10 and Windows Server 2016.

5.36.5.5 Modified Display for E.164

The following display format options are available for virtual station numbers:

- Node code + station number (AMO ZANDE, parameter **DISPMOD=UNKNOWN**),
- PNP data + station number (AMO ZANDE, parameter **DISPMOD=PRIVATE**),
- E.164 data + station number (ZANDE, parameter **DISPMOD=ISDN**)

Data in AMOs KNDEF, KNFOR, and KNPRE is accessed.

This modified display only applies to incoming/outgoing station numbers.

Station numbers saved for key functions or administered using AMOs are always stored in the format node code + station number.

5.36.6 Relevant AMOs

The following AMOs and parameters specified must be considered when activating the feature:

AMO	Parameter	Sprache/ Language	Beschriebung/Description
ACDGP	SUPERRNR	d	Knotenkennzahl + Teilnehmerrufnummer
	SUPEXT	e	node number + extension number
ACDRT	TLNNU	d	Knotenkennzahl + Teilnehmerrufnummer
	STNO	e	node number + extension number
ACDSD	RCGADR	d	Knotenkennzahl + Teilnehmerrufnummer
	CAFDN	e	node number + extension number
ACSU	VFNU	d	Knotenkennzahl + persönliche Rufnummer des VF
	ATNDNO	e	node number + individual attendant number

AMO	Parameter	Sprache/ Language	Beschriebung/Description
ACTDA	ZIELRNR RNR	d	Knotenkennzahl + Teilnehmerrufnummer
	DESTNO STNO	e	node number + extension number
AGENT	AUTORNR	d	Knotenkennzahl + Teilnehmerrufnummer
	AUTOEXT	e	node number + extension number
AUN	TLNNU	d	Knotenkennzahl + Teilnehmerrufnummer
	STNO	e	node number + extension number
BERUM	TLNNU	d	Knotenkennzahl + Teilnehmerrufnummer
	STNO	e	node number + extension number
CHESE	CHEF SEK VTR	d	Knotenkennzahl + Teilnehmerrufnummer
	EXEC SECR REP	e	node number + extension number
	ALTCHEF NEUCHEF	d	Knotenkennzahl + Teilnehmerrufnummer
	OLDEXEC NEWEXEC	e	node number + extension number
	ALTSEK NEUSEK	d	Knotenkennzahl + Teilnehmerrufnummer
	OLDSECR NEWSECR	e	node number + extension number
COMGR	TLNNU	d	Knotenkennzahl + Teilnehmerrufnummer
	STNO	e	node number + extension number
DCIC	TLNNR	d	Knotenkennzahl + Teilnehmerrufnummer
	STNO	e	node number + extension number

AMO	Parameter	Sprache/ Language	Beschriebung/Description
DIDCR	REGEL	d	Knotenkennzahl + Teilnehmerrufnummer
	DIGITS	e	node number + extension number
DIMSU	ZANLNUNT	d	Anzahl der Netzwerk-Teilnehmer mit mehrdeutigen Nummern.
	NWNUNSUB	e	number of network subscribers with ambiguous numbers
DSSU	TLNNU	d	Knotenkennzahl + Teilnehmerrufnummer
	STNO	e	node number + extension number
HISTA	TLNNU	d	Knotenkennzahl + Teilnehmerrufnummer
	STNO	e	node number + extension number
HOTLN	ZIEL	d	Knotenkennzahl + Teilnehmerrufnummer
	DEST	e	node number + extension number
KCSU	TLNNU	d	Knotenkennzahl + Teilnehmerrufnummer
	STNO	e	node number + extension number
	TLNNUSEK	d	Knotenkennzahl + Teilnehmerrufnummer => muss gleiche Knotenkennzahl wie TLNNU haben, d.h. im gleichen Virtuellen Knoten sein
	STNOSEC	e	node number + extension number => must be the same node number as in STNO, they must be in the same virtual node
KNDEF	DFLT	d	Default Knoten (nur bei TYP=EIGEN)
	DFLT	e	default node (only with TYPE=OWN)

AMO	Parameter	Sprache/ Language	Beschriebung/Description
	KNNR	d	Virtuellle Knotennummer. Führende Nullen können eingegeben werden, werden aber unterdrückt. Nachfolgende Nullen sind nur bei Knoten vom TYP=FREMD erlaubt. Knotennummer 0-0-0 bedeutet Rest der Welt.
	NND	e	virtual node number Leading zeros can be entered; however, these will be suppressed. Trailing zeros are only permitted with TYPE=EXTERNAL nodes. node number 0-0-0 means rest of world
	ISDNSK	d	ISDN Skip Digits. Anzahl der Stellen von Parameter ISDNLC die übersprungen werden müssen um die Teilnehmernummer zu extrahieren, wenn die Teilnehmernummer und die Hauptanschlussummer sich überlappen
	ISDNSK	e	ISDN skip digits. Number of digits of parameter ISDNLC which are to skip to extract the extension number when extension number and office code overlap
	ISDNCC	d	ISDN Landeskennzahl (country code). Standardwert: * (keine Landeskennzahl)
	ISDNCC	e	ISDN country code. Default value: * (no country code)
	ISDNAC	d	ISDN Ortskennzahl (area code). Standardwert: * (keine Ortskennzahl)
	ISDNAC	e	ISDN area code. Default value: * (no area code)
	ISDNLC	d	ISDN Hauptanschlussnummer. Standardwert: ********** (keine Hauptanschlussnummer)
	ISDNLC	e	ISDN local destination code. Default value: ********** (no local destination code)

AMO	Parameter	Sprache/ Language	Beschriebung/Description
	KNOTENKZ	d	Knotenkennzahl fuer Rufnummernplan unknown
	NODECD	e	Node access code for numbering plan unknown
	WABE	d	WABE Gruppe, die zur Bewertung der Zielrufnummer verwendet werden soll
	DPLN	e	dialplan group, that should be used for evaluating the destination number
	EWABE	d	In diesem Virtuellen Knoten erlaubte WABE Gruppen für die darin eingerichteten Teilnehmer. Dieser Parameter wird nur für AMO Konsistenzchecks benötigt.
	ADPLN	e	DPLN groups permitted in this virtual node for the stations configured in this node. This parameter is only required for AMO consistency checks.
	KNOTKZSK	d	Skip Digits fuer Knotenkennzahl (Parameter KNOTENKZ). Anzahl der Stellen von Parameter KNOTENKZ die übersprungen werden müssen um die Teilnehmernummer zu extrahieren, wenn die Teilnehmernummer und die Knotenkennzahl sich überlappen
	NODECDSK	e	Skip digits for node access code (parameter NODECD). Number of digits of parameter NODECD which are to skip to extract the extension number when extension number and node access code overlap
LEMAN	TLNNU DUWA2	d	Knotenkennzahl + Teilnehmerrufnummer
	STNO DID2	e	node number + extension number
LIN	TLNNU	d	Knotenkennzahl + Teilnehmerrufnummer
	STNO	e	node number + extension number
NAVAR	TLNNU	d	Knotenkennzahl + Teilnehmerrufnummer einer Nachtnebenstelle

AMO	Parameter	Sprache/ Language	Beschriebung/Description
	STNO	e	node number + extension number of night service station
	RNR	d	Knotenkennzahl + Platzkennzahl der externen ZVFGR
	CD	e	node number + extension number for ecternal centralized ATND service
PERSI	RUFNU	d	Knotenkennzahl + Teilnehmerrufnummer
	STNO	e	node number + extension number
RUFUM	DUWA1,DUWA2,FAX2 DEEZ	d	Knotenkennzahl + Teilnehmerrufnummer
	DID/DID2 FAX2 DTEZ	e	node number + extension number
SA	RNR	d	Master-Sammelanschluss: Knotenkennzahl + Teilnehmerrufnummer
	CD	e	master hunting group: node number + extension number
SBCSU	TLNNU	d	Knotenzahl + Teilnnehmernummer
	STNO	e	node number + extension number
	WABE	d	Muss eine der erlaubten WABE Gruppen des Parameters EWABE im AMO KNDEF sein.
	DPLN	e	One of the permitted DPLN groups of the parameter ADPLN must be included in the AMO KNDEF.
SCSU	TLNNU	d	Siehe SBSCU
	STNO	e	see SBCSU
	WABE	d	Siehe SBSCU
	DPLN	e	see SBCSU
SDAT	KNNR	d	virtuelle Knotennummer Umkonfigurieren eines Teilnehmers in einen anderen Virtuellen Knoten.

AMO	Parameter	Sprache/ Language	Beschriebung/Description
	NNO	e	virtual node number Station reconfiguration in another virtual node.
SSC	ARUFNU	d	Knotenkennzahl + Teilnehmerrufnummer des ABF-Anschlusses für AMO NAVAR
	UNANO	e	node numbe r+ extension number of night answer station
SSCSU	TLNNU	d	Siehe SBSCU
	STNO	e	see SBCSU
	WABE	d	Siehe SBSCU
	DPLN	e	see SBCSU
SXSU	TLNNU HAUPTNU TLNNUX	d	Knotenkennzahl + Teilnehmerrufnummer
	STNO MAINO STNOX	e	node number + extension number
TACSU	ENACHT	d	Knotenkennzahl + Teilnehmerrufnummer
	INIGHT	e	node number + extension number
TDCSU	ENACHT	d	Knotenkennzahl + Teilnehmerrufnummer
	INIGHT	e	node number + extension number
TGER	TLNNU, FAXRU, DEERU GERRU	d	Knotenkennzahl + Teilnehmerrufnummer
	STNO FAXNO DTENO NUSTNNO	e	node number + extension number
TSU	RNR	d	Knotenkennzahl + Teilnehmerrufnummer

AMO	Parameter	Sprache/ Language	Beschriebung/Description
	STNO	e	node number + extension number
VBZGR	TLNNU	d	Knotenkennzahl + Teilnehmerrufnummer
	STNO	e	node number + extension number
VFGKZ	RNR	d	Knotenkennzahl + Meldekennzahl bei KZP MEL Knotenkennzahl + Platzkennzahl bei KZP VPL Knotenkennzahl + Abfragekennzahl bei KZP ABF
	CD	e	node number + internal call code.for DAR ATND node number + indial call code for DAR ATNDDID node number + answering station number for DAR=GENAN
VFGR	VFNU	d	Knotenkennzahl + Persönliche Rufnummer eines zugeordneten Tag-VF der VF-Gruppe
	ATNDNO	e	node number + individual Attendant number
WABE	KZP	d	KZP=TLN kann jetzt WABE Gruppen abhängig eingerichtet werden KZP=EIGENKZ für die Knotenkennzahl des Virtuellen Knotens – ist WABE Gruppen unabhängig
	DAR	e	Using DAR=STN, DPLN groups can now be configured independently DAR=OWNNODE for the node code of the virtual node – is independent of the DPLN group
	RNR	d	Rufnummer
	CD	e	extension number
	ZLNR	d	Zielnummer Wird benötigt wenn Teilnehmer eines virtuellen Knotens sich in verschiedenen physikalischen Knoten befinden.

AMO	Parameter	Sprache/ Language	Beschriebung/Description
	DESTNO	e	destination number Required when virtual node stations are located in different physical nodes.
	WABE	d	WABE-Gruppe ermöglicht die Eingabe einer neuen Teilnehmer - WABE Gruppen Zuordnung
	DPLN	e	dial plan enables a new station - DPLN group assignment to be entered
ZANDE	VNR	d	Leistunsgmerkmal "Virtueller Rufnummernplan"
	VNR	e	Feature "Virtual Node Number"
	DISPMOD	d	Mögliche Werte: UNBEK=Nicht-VNR: Bei deaktiviertem virtuellen Rufnummernplan (Feature VNR) wird die Teilnehmer Nummer im kuerzest moeglichen Format angezeigt. VNR: Bei aktiviertem virtuellen Rufnummernplan (Feature VNR) wird die Teilnehmer Nummer im Format KNOTENKZ + Teilnehmernummer angezeigt, z.B. 100 or 20 100 PRIVAT=Die Anzeige erfolgt im Format Privater Nummerierungs - Plan , z.B.. 9 44 777 100 ISDN=Die Anzeige erfolgt im E.164-Rufnummern-Format, z.B. 0 089 722 100

AMO	Parameter	Sprache/ Language	Beschriebung/Description
	DISPMOD	e	Possible values: UNKNOWN=Non VNR: For deactivated vitual numbering (feature VNR) the display of shortest possible subscriber numbers is done VNR: For activated vitual numbering (feature VNR) the display is done in format NODECD + subscriber number, e.g. 100 or 20 100 PRIVATE=display of subscriber number in privat numbering plan format, e.g. 9 44 777 100 ISDN=display of subscriber number in E.164 format, e.g. 0 089 722 100
ZIEL	QLRUFNU	d	Quellrufnummer AUL
	SRCNO	e	station number of source FWD
	TYP=NA	d	Namenstaste DR
	TYPE=NAME	e	name key DSS
	TZLRUFNU	d	Ziel-Rufnummer für Namenstasten
	DESTNON	e	destination number for name keys
	BUZRUFNU DZLRUFNU RUFNU ZLRUFNU BZLRUFNU KZLRUFNU	d	Knotenkennzahl + Teilnehmerrufnummer
	DESTNOBZ DESTNOD EVMCD DESTNOF DESTNOM DESTNOR	e	node number + extension number

AMO	Parameter	Sprache/ Language	Beschriebung/Description
ZIELN	TLNNU RNRRU RNRBK RNR1 RNR2 DZLRUFNU VTRSEK RNRCH1 RNRCH1V RNRCH2 RNRCH2V RNRCH3 RNRCH3V RNRCH4 RNRCH3V	d	Knotenkennzahl + Teilnehmerrufnummer
	STNO STNORXFR STNOMB STNO1 STNO2 DESTNOD STNOREP STNOEX1 STNOEX1R STNOEX2 STNOEX2R STNOEX3 STNOEX3R STNOEX4 STNOEX4R	e	node number + extension number

5.37 Voice Compression

5.37.1 General

5.37.1.1 Task of the Feature

The feature Voice Compression (VC) increases the capacity of speech channels on S0/S2 trunks.

	B-channels without VC	speech channels with VC
per S0 trunk	2	up to 7
per S2 trunk	30	up to 112

If a S0/S2 B-channel is configured for VC, it can only be used for voice communication. Therefore it is possible to use only some and not all B-channels of a S0/S2 circuit by VC.

From ATM level 3 an STMA circuit can be a partner circuit, provided the STMA board is configured as "STMA networking 1.0 (=backboning, ATMPBB)" or as STMA networking 2.0 (=Networking 2.0, ATMNW20). With operating mode "ATMNW20" only ATMPVCxx circuits should be configured, as ATMSVC circuits do not support the required functions.

Other STMA functions for this feature have not yet been released . An STMA circuit handles like an S2 circuit and will not be described in detail.

5.37.1.2 The Voice Compression Board

Voice Compression needs a new board called VCM (Voice Compression Module) which is available in two versions:

Name	Item number	description
VCM-B15	Q2235-X	This is the standard VCM with 15 B-channels. It occupies 4 B-channels of a S0/S2 board. In case of a S0 board the 4 B-channels (2 S0 trunks) have to be in the same trunk group.
VCM-B7	Q2235-X100	This variant of VCM with 7 B-channels occupies 2 B-channels of the S0/S2 board. It should be prevential used if on a S0/S2 board not more than 2 B-channels can be occupied.

- The G.728 Standard is used for compression.
- The VCM supports a transit mode where the voice data will stay compressed.
- The VCM can be used only with the new Atlantik architecture.

5.37.1.3 Description of Synonyms which are Used

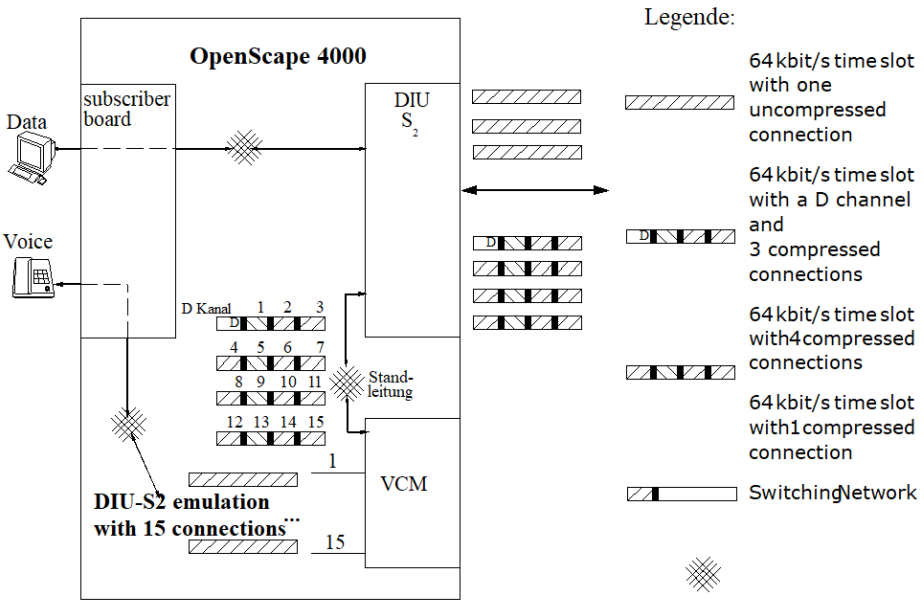
VCSU:	The compressed B-channels of a VCM are merged to a Voice Compression SubUnit. The assignment of VCM B-channels to a VCSU is always fix.

VCSU	VCM Channels
1	D-channels B-channels 1-3
2	B-channels 4-7
3	B-channels 8-11
4	B-channels 12-15

Partner board:	S0/S2 STMA board, which will be used to transmit the compressed speech channels.
Partner B-channel:	B-channel of a S0/S2 STMA board, which is connected via a Nailed Connection with a VCSU of a VCM.
Nailed Connection (NC):	Expression for a permanent Switching Network connection. In case of Voice Compression it's the connection between a VCSU and a Partner B-channel.

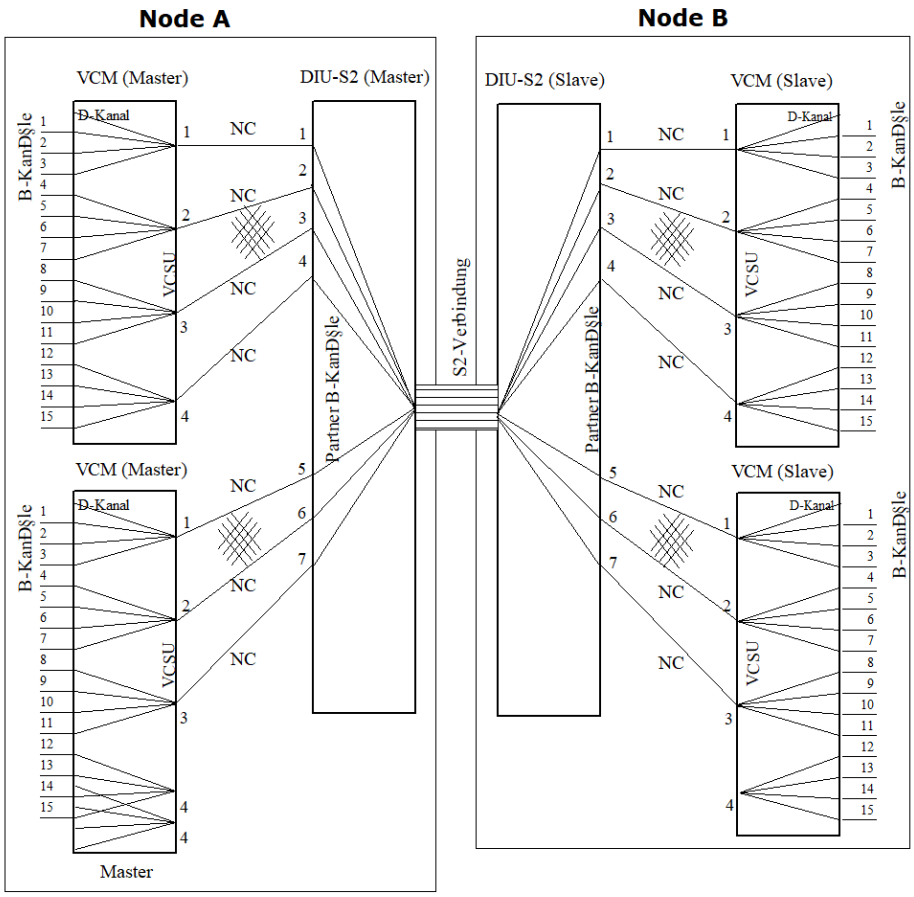
5.37.1.4 Functional Overview

The VCM compress the 64KBit/s B-channels to the 16KBit/s sub-channels. One S0/S2 B-channel (64KBit/s) will be used to transmit 4 sub-channels to the other OpenScape 4000 node.



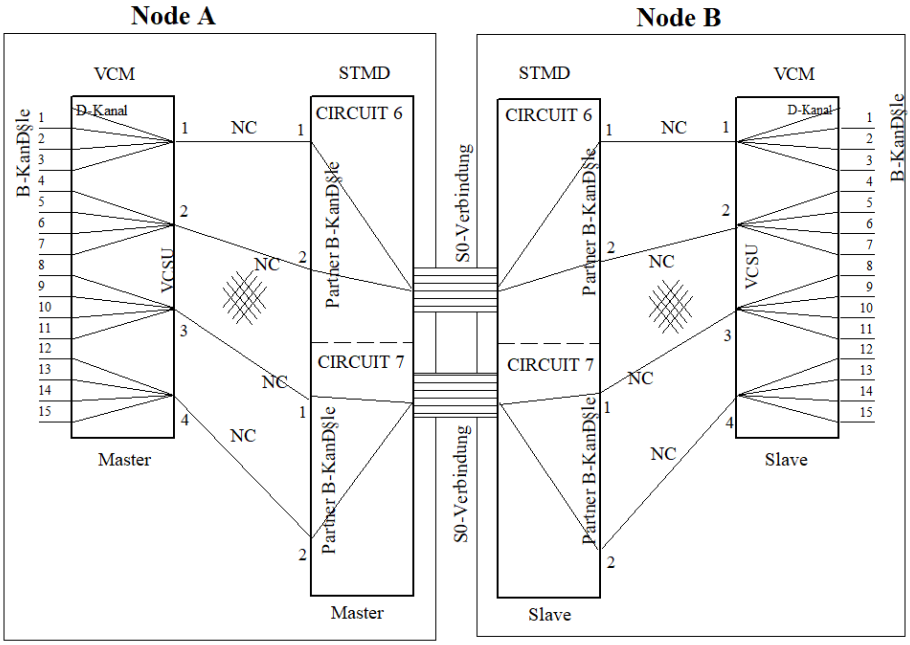
5.37.1.4.1 Figures of Symmetric Voice Compression Configuration

S2 Link



There are no restrictions to choose the Partner B-Channels.

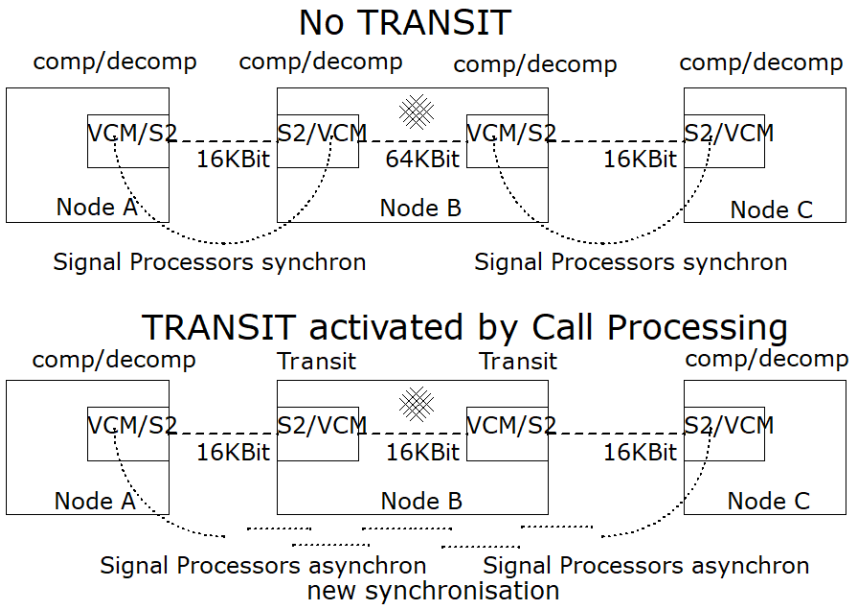
S0 Link

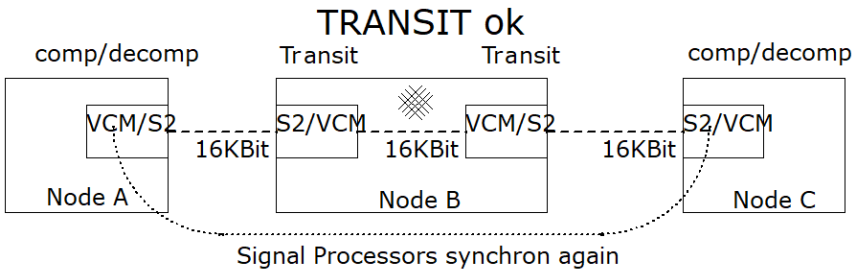


There are no restrictions to choose the Partner B-Channels.

5.37.1.5 VCM Transit Overview

If the VCM transit function is activated the voice connection will stay compressed. Each Signal Processor of a VCM B-Channel can be set seperatly to the transit mode.





5.37.1.6 Administration Overview

The following administration steps are needed for the feature Voice Compression:

- Memory Configuration (AMO DIMSU)
- Costumer Feature List Configuration (AMO FEASU)
- VCM Boards Configuration (AMO BCSU)
- Class of Trunk Configuration (AMO COT)
- Trunk Group Configuration (AMO BUEND)
- Trunk Configuration (AMO TDCSU)
- Activation/Deactivation of Boards (AMO BSSU)
- Activation/Deactivation of Circuits (AMO DSSU)
- LCR Configuration (AMO COSSU, AMO LDAT, AMO RICHT)
- Subscriber Configuration (AMO SCSU, AMO SBCSU)
- Voice Compression Configuration (AMO VOICO)

5.37.2 Basic Administration

5.37.2.1 Allocation of Needed Memory

The VCM trunks will be added to the system like S2 trunks. Therefore the value of PRI has to be calculated by the number of S2 trunks + number of VCM trunks.

```
ADD-DIMSU:TYPE=BASIC,PRI=<?>;
```

For each occupied S0/S2 Partner B-channel a memory element has to be allocated. One VCM-B7 occupies up to 2 and one VCM-B15 occupies up to 4 Partner B-channels.

```
ADD-DIMSU:TYPE=NETWORK,VOICO=<?>;
```

number of Boards	available speech channels	value of parameter VOICO (occupied Partner B-channels)
1 * VCM-B7	7	2
1 * VCM-B15	15	4
7 * VCM-B15	105	28

5.37.2.2 Costumer Feature List

Call Processing only uses VC trunks if the feature is activated.

```
CHANGE-FEASU:TYPE=A,CM=VOICO;
```

5.37.2.3 VCM Board Configuration

VCM-B15

```
ADD-BCSU:MTYPE=PER,LTU=<?>,EBT=<?>,
PARTNO="Q2235-X   ";
```

VCM-B7

```
ADD-BCSU:MTYPE=PER,LTU=<?>,EBT=<?>,
PARTNO="Q2235-X100";
```

5.37.2.4 Class of Trunk Configuration

- The following COT parameters have to be added to a COT for VC trunks:
  - SPCM = compressed speech channel
  - NLHT = no local hold tone, hold tone from remote system When VCM transit is activated, there is a noise based on connection setup / connection release during the toggling function. If the COT parameter NLHT is set the connection will not be released.

    ```
    CHANGE-COT:COTNO=<?>,COTREF=COTADD,COTPAR=SPCM&NLHT;
    ```
- It's only possible to compress voice connections. Therefore all trunks where the type of the connection (voice or data) is unknown or connected with an multiplexer have to be marked with the following COT parameter:
  - VCMN = voice compression not allowed

    ```
    CHANGE-COT:COTNO=<?>,COTREF=COTADD,COTPAR=VCMN;
    ```

    See also Section 57.3.2, "No Voice Compression for Particular Subscribers", on page 725

5.37.2.5 Trunk Group Configuration

The VCM trunks have to be combined in separate trunk groups.

```
ADD-BUEND:TGRP=<?>,NAME=<?>,NO=<?>,
RSV=<?>,TRACENO=<?>;
```

5.37.2.6 Trunk Configuration

In normal circumstances, the parameters of the VC trunks are based on the parameters of the partner trunk. However there are some parameters which have to be different:

• COTNO:	The VCM trunk requires a COT which contains the parameter SPCM. All other trunks should not have this COT parameter.
• DEV:	The VC trunk has to be added with the device type VCCONN (digital tie trunk circuit with voice compression).
• TGRP:	The VC trunks should be in own trunk groups.
• BCHAN:	The VCM has, depending from board type, 7 or 15 B-channels.
• PROTVAR:	The protocol variants CORNV33 or ECMA1 should be used prevered because they support the new protocol element "Allowed Compression/Decompression Cycles".

The two corresponding VCM trunks (Node A / Node B) have to be configured with a MASTER/SLAVE relation (like S0/S2 trunks). This has to be controlled by the loadware parameter.

Example of a S2/VCM Configuration:

The different/important parameter values are marked bold.

S2 Trunk:

```
ADD-TDCSU:OPT=NEW,PEN=1-2-49-0,COTNO=20,COPNO=0,DPLN=0,
ITR=0,COS=1,LCOSV=1,LCOSD=1,CCT="            ",DESTNO=0,
PROTVAR=CORNV33,SEGMENT=1,TCHARG=N,SUPPRESS=0,TRACOUNT=31,
SATCOUNT=MANY,NNO=604,ALARMNO=0,FIDX=1,CARRIER=1,
ZONE=EMPTY,FWDX=1,DEV=S2CONN,TGRP=98,SRCHMODE=ASC,
BCHAN=1&&30,BCNEG=Y,BCGR=1,INS=N,LWPAR=8;
```

VCM Trunk:

```
ADD-TDCSU:OPT=NEW,PEN=1-1-55-0,COTNO=50,COPNO=0,DPLN=0,
ITR=0,COS=1,LCOSV=1,LCOSD=1,CCT="            ",DESTNO=0,
PROTVAR=CORNV33,SEGMENT=1,TCHARG=N,SUPPRESS=0,TRACOUNT=31,
SATCOUNT=MANY,NNO=604,ALARMNO=0,FIDX=1,CARRIER=1,
ZONE=EMPTY,FWDX=1,DEV=VCCONN,TGRP=99,SRCHMODE=ASC,
BCHAN=1&&15,BCNEG=Y,BCGR=1,INS=N,LWPAR=8;
```

Example of a S0/VCM Configuration:

The different/important parameter values are marked bold.

S0-Trunk:

```
ADD-TDCSU:OPT=NEW,PEN=1-02-115-0,COTNO=20,COPNO=0,DPLN=0,
```

```
ITR=0,COS=1,LCOSV=1,LCOSD=1,CCT="            ",DESTNO=0,
PROTVAR=CORNV33,SEGMENT=1,TCHARG=N,SUPPRESS=0,TRACOUNT=31,
SATCOUNT=MANY,NNO=604,ALARMNO=0,FIDX=1,CARRIER=1,
ZONE=EMPTY,FWDX=1,DEV=S0CONN,INS=Y,TGRP=100,SRCHMODE=ASC,
MASTER=Y,SMD=Y,CNTRNR=0,BCNEG=N;
```

VCM-Trunk:

```
ADD-TDCSU:OPT=NEW,PEN=1-01-067-0,COTNO=50,COPNO=0,DPLN=0,
ITR=0,COS=1,LCOSV=1,LCOSD=1,CCT="            ",DESTNO=0,
PROTVAR=CORNV33,SEGMENT=1,TCHARG=N,SUPPRESS=0,TRACOUNT=31,
SATCOUNT=MANY,NNO=604,ALARMNO=0,FIDX=1,CARRIER=1,
ZONE=EMPTY,FWDX=1,DEV=VCCONN,TGRP=101,SRCHMODE=ASC,
BCHAN=1&&7,BCNEG=Y,BCGR=1,INS=N,LWPAR=8;
```

5.37.2.7 Activation/Deactivation of Boards and Circuits

VCM board and circuit:

The VCM board and circuit can be switched like all other boards and circuits with the AMOs BSSU and DSSU.

Partner board and circuit:

In case of pre-blocking of a S0/S2 board or S0/S2 circuit the AMOs BSSU and DSSU check if B-channels are occupied by VC and if so the affected VCM boards or circuits will be pre-blocked too. During activation the occupation by VC will be also checked. If the determined VCM boards or circuits are in a pre-blocked status, they will be activated too.

NOTICE: After deactivation of a LTU the status "pre-blocked" of boards and circuits is lost. In this case the automatically pre-blocked VCM boards or circuits have to be activated manually.

5.37.2.8 LCR Configuration

All VC trunks to a specific route are combined in one trunk group. This VC trunk group will be used in a new route element which has been added to the route.

In the following example all relevant parameters are marked bold:

```
ADD-LDAT:LROUTE=<?>,LSVC=VCE,LVAL=1,TGRP=<?>,
ODR=<?>,LAUTH=64,CARRIER=<?>,ZONE=<?>,
LATTR=VOICO,MSO=<?>,VCCYC=6;
```

• LSVC:	A compressed route element has to be created with the LCR service voice.
• LAUTH:	With a particular LCR authorization it's possible to exclude some subscribers from VC. (i.e. necessary in case of analog fax devices)

• LATTR:	The LCR route element should be marked by the LCR attribute VOICO to have the option for a selected query.
• VCCYC:	The value of this parameter limits the number of compression/ decompression cycles, because too much compression/ decompression cycles decrease the quality of speech. The deterioration of voice quality is marginal with up to 8 cycles of compression/decompression. Multiple compression/decompression cycles are the result of not available VOICO routes in a network during the connection setup.

5.37.2.9 Voice Compression Configuration

The Nailed Connection between a VCM and a Partner board will be added with:

```
ADD-VOICO:PEN1=<vcm-pen>,VCSU=<?>,
PEN2=<partner line>,BCHAN=<partner bchan>,
INS=Y/N;
```

Meaning of the parameter INS:

- INS=Y:

  After adding a NC it will be activated immediately. Therefore the circuits of VCM and Partner board have to be already locked.
- INS=N:

  In this case the NC will not be activated and the VCM B-channels remains locked. The Partner B-channel will not be occupied and stays as a normal S0/S2 B-channel.

  The VCM B-channels have be activated later with ACTIVATE-VOICO. See detailed description in Section 57.2.10, "Deactivation/Activation of Voice Compression", on page 721.

> **NOTICE:** A symmetric configuration of the NCs at both nodes is necessary. See figure in Section 57.1.4.1, "Figures of Symmetric Voice Compression Configuration", on page 714.

5.37.2.10 Deactivation/Activation of Voice Compression

In case of VC activated, one VCM-B15 offers 15 B-channels (only voice) and occupies 4 B-channels (data & voice). Therefore the capacity of B-channels for data transfer will decrease.

With the function "deactivation/activation of VC" the relation of voice channels to data/voice channels can be adapted when required.

It's possible to switch each VCSU separately.

Activated VCSUs (occupied Partner B-channels)	S2 B-channels (data & voice)	VCM B-channels (only voice)	required VCMs
30	0	112	7 VCM-B15, 1 VCM-B7
29	1	108	7 VCM-B15, 1 VCM-B7
28	2	105	7 VCM-B15
27	3	101	7 VCM-B15
26	4	97	7 VCM-B15
25	5	93	7 VCM-B15
24	6	90	6 VCM-B15
20	10	75	5 VCM-B15
16	14	60	4 VCM-B15
12	18	45	3 VCM-B15
8	22	30	2 VCM-B15
4	26	15	1 VCM-B15
3	27	11	1 VCM-B15
2	28	7	1 VCM-B15
1	29	3	1 VCM-B15
0	30	0	none

The deactivation/activation of VC requires deactivated circuits of VCM- and its Partner board. See detailed description in Section 57.2.7, "Activation/ Deactivation of Boards and Circuits", on page 720.

Deactivate Voice Compression:

```
DEACTIVATE-DSSU:OFFTYPE=DC,TYPE=PEN,PEN1=<partner line>;

DEACTIVATE-VOICO:PEN1=<vcm line>[,VCSU=<?>];

ACTIVATE-DSSU:ONTYPE=ANL,TYPE=PEN,PEN1=<partner line>;
```

The NCs to all or oneVCSU of a VCM will be deactivated. Afterwards the Partner B-channels are available again as normal S0/S2 B-channel (data&voice); the VCM B-channels (only for voice) remain blocked.

Activate Voice Compression:

```
DEACTIVATE-DSSU:OFFTYPE=DC,TYPE=PEN,PEN1=<partner-circuit>;
```

```
ACTIVATE-VOICO:PEN1=<vcm-circuit>[,VCSU=<?>];

ACTIVATE-DSSU:ONTYPE=ANL,TYPE=PEN,PEN1=<partner-circuit>;
```

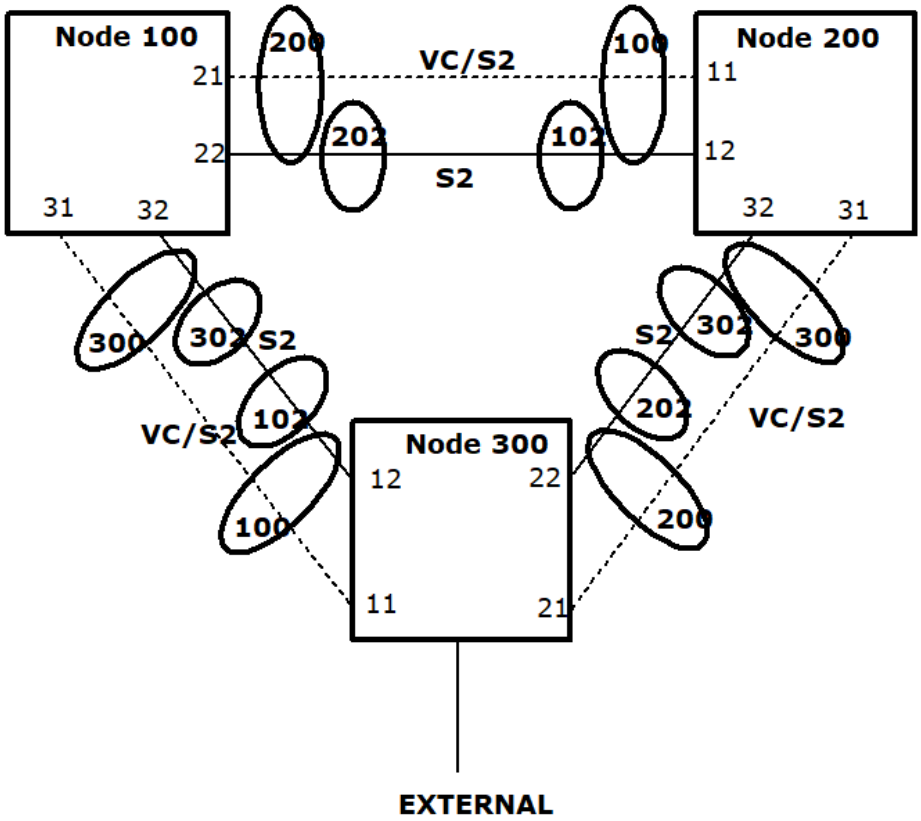
The NCs to all or oneVCSU of a VCM will be activated. Afterwards the affected Partner B-channels (data & voice) remain blocked; the VCM B-channels (only for voice) are ready again.

NOTICE: The NCs at both nodes have to be switched symmetric. See figure in Section 57.1.4.1, "Figures of Symmetric Voice Compression Configuration", on page 714.

5.37.3 Extended Administration

5.37.3.1 Mixed Routes (compressed/not compressed)

The following example shows a OpenScape 4000 network with 3 nodes, connected with a S2 link. The S2 B-channels are partial used by Voice Compression for voice connections only. The other S2 B-channels will be used for data and analog FAX/MODEM connections. If no more compressed B-channels are available, the uncompressed B-channels can be used for voice too.



From Node 100 to 200:

```
ADD-RICHT:MODE=CD,CD=00200,LRTE=200,SVC=VCE,
TGRP1=21&22,CPS=0,DESTNO=21;

ADD-RICHT:MODE=CD,CD=00200,SVC=DTE,TGRP1=22,CPS=0;

ADD-LDAT:LROUTE=200,LSVC=VCE,LVAL=1,ODR=1,LAUTH=8,
TGRP=21,LATTR=VOICO;

ADD-LDAT:LROUTE=200,LSVC=VCE,LVAL=2,ODR=1,LAUTH=1,TGRP=22;

ADD-LDAT:LROUTE=200,LSVC=DTE,LVAL=1,ODR=1,LAUTH=1,TGRP=22;
```

From Node 100 to 300:

```
ADD-RICHT:MODE=CD,CD=00300,LRTE=300,SVC=VCE,TGRP1=31&32,
CPS=0,DESTNO=31;

ADD-RICHT:MODE=CD,CD=00300,SVC=DTE,TGRP1=32,CPS=0;

ADD-LDAT:LROUTE=300,LSVC=VCE,LVAL=1,ODR=1,LAUTH=8,TGRP=31,
LATTR=VOICO;

ADD-LDAT:LROUTE=300,LSVC=VCE,LVAL=2,ODR=1,LAUTH=1,TGRP=32;

ADD-LDAT:LROUTE=300,LSVC=DTE,LVAL=1,ODR=1,LAUTH=1,TGRP=32;
```

From Node 200 to 100:

```
ADD-RICHT:MODE=CD,CD=00100,LRTE=100,SVC=VCE,TGRP1=11&12,
CPS=0,DESTNO=21;

ADD-RICHT:MODE=CD,CD=00100,SVC=DTE,TGRP1=22,CPS=0;

ADD-LDAT:LROUTE=100,LSVC=VCE,LVAL=1,ODR=1,LAUTH=8,
TGRP=21,LATTR=VOICO;

ADD-LDAT:LROUTE=100,LSVC=VCE,LVAL=2,ODR=1,LAUTH=1,TGRP=22;

ADD-LDAT:LROUTE=100,LSVC=DTE,LVAL=1,ODR=1,LAUTH=1,TGRP=22;
```

From Node 200 to 300:

```
ADD-RICHT:MODE=CD,CD=00300,LRTE=300,SVC=VCE,TGRP1=31&32,
CPS=0,DESTNO=31;

ADD-RICHT:MODE=CD,CD=00300,SVC=DTE,TGRP1=32,CPS=0;

ADD-LDAT:LROUTE=300,LSVC=VCE,LVAL=1,ODR=1,LAUTH=8,
TGRP=31,LATTR=VOICO;

ADD-LDAT:LROUTE=300,LSVC=VCE,LVAL=2,ODR=1,LAUTH=1,TGRP=32;
```

```
ADD-LDAT:LROUTE=300,LSVC=DTE,LVAL=1,ODR=1,LAUTH=1,TGRP=32;
```

From Node 300 to 100:

```
ADD-RICHT:MODE=CD,CD=00100,LRTE=100,SVC=VCE,TGRP1=11&12,
CPS=0,DESTNO=11;

ADD-RICHT:MODE=CD,CD=00100,SVC=DTE,TGRP1=22,CPS=0;

ADD-LDAT:LROUTE=100,LSVC=VCE,LVAL=1,ODR=1,LAUTH=8,TGRP=21,
LATTR=VOICO;

ADD-LDAT:LROUTE=100,LSVC=VCE,LVAL=2,ODR=1,LAUTH=1,TGRP=22;

ADD-LDAT:LROUTE=100,LSVC=DTE,LVAL=1,ODR=1,LAUTH=1,TGRP=22;
```

From Node 300 to 200:

```
ADD-
RICHT:MODE=CD,CD=00200,LRTE=200,SVC=VCE,TGRP1=21&22,CPS=0,
DESTNO=21;

ADD-RICHT:MODE=CD,CD=00200,SVC=DTE,TGRP1=22,CPS=0;

ADD-LDAT:LROUTE=200,LSVC=VCE,LVAL=1,ODR=1,LAUTH=8,TGRP=21,
LATTR=VOICO;

ADD-LDAT:LROUTE=200,LSVC=VCE,LVAL=2,ODR=1,LAUTH=1,TGRP=22;

ADD-LDAT:LROUTE=200,LSVC=DTE,LVAL=1,ODR=1,LAUTH=1,TGRP=22;
```

5.37.3.2 No Voice Compression for Particular Subscribers

For certain connections (i.e. analog fax, modem, phones with voice decrypting (privacy module)) call processing cannot identify them as data connections where Voice Compression isn't possible. Therefore these connections have to be excluded from Voice Compression by administration.

For connections established by an internal station, Voice Compression is prevented by LCR control mechanisms.

Incoming external connections to these stations can be prevented by an entry in the digit analysis.

5.37.3.2.1 Connections from Intern to Intern/External

In the following examples the LCR authorization 8 will be used to include/ exclude a particular subscriber from Voice Compression.

1) LCR Class of Service (LCOSS):

   The LCOSV 1 with the LCR authorization 8 will be used for all subscribers allowed to use Voice Compression.

```
CHANGE-COSSU:TYPE=LCOSV,LCOSV=1,ALCR=1&&8,DLCR=9&&64;
```

   The LCOSV2 without the LCR authorization 8 will be used for all subscribers which have to be excluded from Voice Compression.

```
CHANGE-COSSU:TYPE=LCOSV,LCOSV=2,ALCR=1&&7,DLCR=8&&64;
```

2) LCR Route Elements:

   For that example there are two trunk groups for LCR route 200.

   The Voice Compression trunk group 21 requires the LCR authorization (LAUTH) 8. Therefore it can be used only from subscribers with LCOSV 1. In case of trunk group overflow these subscribers can use the trunk group 22 with S2 B channels, too, as LCOSV1 contains the LAUTH8.

   The subscribers with the LCOSV 2 can only be routed via trunk group 98 due to the missing LCR authorization 8.

```
ADD-
LDAT:LROUTE=200,LSVC=VCE,LVAL=1,TGRP=21,ODR=21,LAUTH=8,
LATTR=VOICO;

ADD-
LDAT:LROUTE=200,LSVC=VCE,LVAL=2,TGRP=22,ODR=22,LAUTH=1;
```

3) Subscriber Configuration:

   The subscriber 2220 should use VC and therefore gets the LCOSV1.

```
ADD-
SCSU:STNO=2220,PEN=1-2-109-0,DVCFIG=ANATE,DPLN=0,ITR=7,
COS1=2,COS2=4,LCOSV1=1,LCOSV2=1,LCOSD1=1,LCOSD2=1,COSX=0,
SPDI=10,COFIDX=0,DIAL=DTMF,INS=YES,ACKST=CHR,SSTNO=NO;
```

   The subscriber 2221 has to be excluded from VC and therefore gets the LCOSV 2.

```
ADD-
SCSU:STNO=2221,PEN=1-2-109-1,DVCFIG=ANATE,DPLN=0,ITR=7,
COS1=2,COS2=4,LCOSV1=2,LCOSV2=2,LCOSD1=1,LCOSD2=1,COSX=0,SPDI=1
COFIDX=0,DIAL=DP,INS=YES,ACKST=CHR,SSTNO=NO;
```

5.37.3.2.2 Connections from External to Intern

An external incoming analog FAX or MODEM connection has to be routed without VC. Therefore, all internal fax and modem numbers must be listed in the WABE with a destination number which leads to a route without VC.

Based on the example of a route configuration in Section 57.3.1, "Mixed Routes (compressed/not compressed)", on page 723, additional new routes must be defined.

From Node 100 to 200:

```
ADD-RICHT:MODE=CD,CD=00202,LRTE=202,SVC=ALL,TGRP1=22,
CPS=0,DESTNO=22;

ADD-LDAT:LROUTE=202,LSVC=ALL,LVAL=1,ODR=1,LAUTH=1,TGRP=22;
```

From Node 100 to 300:

```
ADD-RICHT:MODE=CD,CD=00302,LRTE=302,SVC=ALL,TGRP1=32,
CPS=0,DESTNO=32;

ADD-LDAT:LROUTE=302,LSVC=ALL,LVAL=1,ODR=1,LAUTH=1,TGRP=22;
```

From Node 200 to 100:

```
ADD-RICHT:MODE=CD,CD=00102,LRTE=102,SVC=ALL,TGRP1=12,
CPS=0,DESTNO=12;

ADD-LDAT:LROUTE=102,LSVC=ALL,LVAL=1,ODR=1,LAUTH=1,TGRP=12;
```

From Node 200 to 300:

```
ADD-RICHT:MODE=CD,CD=00302,LRTE=302,SVC=ALL,TGRP1=32,
CPS=0,DESTNO=32;

ADD-LDAT:LROUTE=302,LSVC=ALL,LVAL=1,ODR=1,LAUTH=1,TGRP=32;
```

From Node 300 to 100:

```
ADD-RICHT:MODE=CD,CD=00102,LRTE=102,SVC=ALL,TGRP1=12,
CPS=0,DESTNO=12;

ADD-LDAT:LROUTE=102,LSVC=ALL,LVAL=1,ODR=1,LAUTH=1,TGRP=12;
```

From Node 300 to 200:

```
ADD-RICHT:MODE=CD,CD=00202,LRTE=202,SVC=ALL,TGRP1=22,
CPS=0,DESTNO=22;

ADD-LDAT:LROUTE=202,LSVC=ALL,LVAL=1,ODR=1,LAUTH=1,TGRP=22;
```

In the dialing plan of each node the new destination numbers have to be set for all FAX and MODEM subscriber numbers.

Node	Destination number for FAX/ MODEM	Destination number for the other subscriber numbers
100	12	11
200	22	21
300	32	31

Example: The FAX subscriber 10123 of node 100 requires the following changes of the dialing plan in nodes 200 and 300:
`CHANGE-WABE:CD=10123,DESTNO=12;`

There is also the possibility to exclude all incoming connections of an external bundle from voice compression using a special COT parameter. See also Section 57.2.4, "Class of Trunk Configuration", on page 718.

In this case WABE modification is not necessary.

5.37.3.3 More Data Channels or More Speech Channels

If there is the necessity for an increase of data channels, i.e. during the night, the number of B channels to be additionally used for data connections can be increased by directed deactivation of Voice Compression subunits.

If more B-channels for voice are needed, the deactivated Voice Compression NCs have to be switched on again.

For a detailed description see Section 57.2.10, "Deactivation/Activation of Voice Compression", on page 721.

At present, there is no external application which supports this functionality.

5.37.3.4 Route Optimization

There is the possibility to prevent Route Optimization in case of Voice Compression. Till today there are no reasons to use it.

```
CHANGE-ZAND:TYPE=ALLDATA2,ROLCKVCM=YES;
```

5.37.4 Error Messages

The feature Voice Compression has requested 3 new error messages.

- F5993 CIRCIUT L2 ERROR VC D-channel of Voice Compression not active. (Level-2-error)
- F5994 CIRCUIT B CHANNEL VC DEF B-channel of Voice Compression not active.
- F5995 CIRCUIT B CHANNEL VC OK B-channel of Voice Compression active again.

How to interpret the auxiliary data:

Byte 0 =	10	Error type (DB_M_QF_CIR_L2_ERR_SET)
		D-channel error or B-channel changes
Byte 1, 2 =	0001	Number of reported errors = 01
Byte 3 =	02	Length of following data: 2 Bytes
Byte 4 =	1. Status byte:	Bit 0 = D-channel
		Bit 1-7 = B-channel 1-7
Byte 5 =	2. Status byte:	Bit 8-15 = B-channel 8-15

If the channel is active the corresponding bit is set to 1. If the channel is defect or not configured the corresponding bit is set to 0.

In case of the VCM-B7 (without B-channel 8-15) the second status byte is set always to 00.

All error messages are described in the documentation **OpenScape 4000/ HiPath 4000, Troubleshooting (AlFe)**.

Examples of error messages:

The error messages are based on following configuration:

Both switches are connected with 2 S0 trunks which are linked to one VCM-B15. The VCM D-channel and the VCM B-channels 1-7 (VCSU 1 + 2) occupies the STMD trunk 0 and the VCM B-channels 8-15 (VCSU 3 + 4) occupies the STMD trunk 1.

1) At the remote system the STMD trunk 0 has been switched off. (VCM D-channel and B-channels 1-7 are affected)

```
F5414 M4 N5381 OUT SERV BPA   CIRCUIT  L2 ERROR
   97-02-10 07:33:36
       ALARM CLASS:SWU-PER:001

          **  :LTG1 :LTU2 :115:  0   : 0 Q2174-X    STMD
      BST:01  FW: C360-L
       REASON:01H  DEACTIVATED BY PEER

       FORMAT:36

F5414 M4 N5382 OUT SERV BPA   CIRCUIT  L2 ERROR
   97-02-10 07:33:36
       ALARM CLASS:SWU-PER:001

          **  :LTG1 :LTU2 :115:  0   : 0 Q2174-X    STMD
      BST:01  FW: C360-L
       REASON:0BH  TEI REMOVED

       FORMAT:36

F5994 M4 N5383 OUT SERV BPA   CIRCUIT  B CHANNEL VC DEF
   97-02-10 07:33:38
       ALARM CLASS:SWU-PER:001

          **  :LTG1 :LTU1 :055:  0   : 0 Q2235-X    VCM-
B15   BST:01  PLS:-B3
       FORMAT:22
       1000010201FFFFFFFFFFFFFFFFFFFFF
 FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
 FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
 FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFF


F5414 M4 N5384 OUT SERV BPA   CIRCUIT  L2 ERROR
    97-02-10 07:33:49
       ALARM CLASS:SWU-PER:001
```

```
          **  :LTG1 :LTU1 :055:  0   : 0 Q2235-X    VCM-
B15   BST:01  PLS:-B3
       REASON:05H  PEER OUT OF ORDER

       FORMAT:36

F5993 M4 N5385 OUT SERV BPA   CIRCUIT  L2 ERROR VC
     97-02-10 07:33:49
       ALARM CLASS:SWU-PER:001

          **  :LTG1 :LTU1 :055:  0   : 0 Q2235-X    VCM-
B15   BST:01  PLS:-B3
       FORMAT:22
       1000010200FFFFFFFFFFFFFFFFFFFF
 FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
 FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
 FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFF
```

2) At the remote system the STMD trunk 0 has been activated again.

```
F5418 M4 N5389 IN SERV  BPA   CIRCUIT  LX ACTIVE
 97-02-10 07:35:16
       ALARM CLASS:SWU-PER:001

          **  :LTG1 :LTU2 :115:  0   : 2 Q2174-X    STMD
      BST:01  FW: C360-L
       REASON:09H  LAYER 3 ACTIVE

       FORMAT:36

F5418 M4 N5390 IN SERV  BPA   CIRCUIT  LX ACTIVE
 97-02-10 07:35:16
       ALARM CLASS:SWU-PER:001

          **  :LTG1 :LTU1 :055:  0   :15 Q2235-X    VCM-
B15   BST:01  PLS:-B3
       REASON:09H  LAYER 3 ACTIVE

       FORMAT:36
```

3) At the remote system the STMD trunk 1 has been deactivated. (VCM B-channels 8-15 are affected)

```
F5414 M4 N5391 OUT SERV BPA   CIRCUIT  L2 ERROR
 97-02-10 07:38:31
       ALARM CLASS:SWU-PER:001

          **  :LTG1 :LTU2 :115:  1   : 0 Q2174-X    STMD
      BST:01  FW: C360-L
       REASON:01H  DEACTIVATED BY PEER

       FORMAT:36
```

```
F5414 M4 N5392 OUT SERV BPA   CIRCUIT  L2 ERROR
 97-02-10 07:38:31
       ALARM CLASS:SWU-PER:001

          **  :LTG1 :LTU2 :115:  1   : 0 Q2174-X    STMD
      BST:01  FW: C360-L
       REASON:0BH  TEI REMOVED

       FORMAT:36

F5414 M4 N5393 OUT SERV BPA   CIRCUIT  L2 ERROR
  97-02-10 07:38:31
       ALARM CLASS:SWU-PER:001

          **  :LTG1 :LTU2 :115:  1   : 0 Q2174-X    STMD
      BST:01  FW: C360-L
       REASON:0BH  TEI REMOVED

       FORMAT:36

F5412 M4 N5394 OUT SERV BPA   CIRCUIT  L1 ERROR
  97-02-10 07:38:33
       ALARM CLASS:SWU-PER:001

          **  :LTG1 :LTU2 :115:  1   : 0 Q2174-X    STMD
      BST:01  FW: C360-L
       REASON:04H  NO SIGNAL        (LOCAL ALARM)

       FORMAT:36

F5994 M4 N5395 OUT SERV BPA   CIRCUIT  B CHANNEL VC DEF
   97-02-10 07:38:33
       ALARM CLASS:SWU-PER:001

          **  :LTG1 :LTU1 :055:  0   : 0 Q2235-X    VCM-
B15    BST:01  PLS:-B3
       FORMAT:22
       10000102FF00FFFFFFFFFFFFFFFFFF
 FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
 FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
 FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFF
```

4) At the remote system the STMD trunk 1 has been switched on again.

```
F5418 M4 N5399 IN SERV  BPA   CIRCUIT  LX ACTIVE
   97-02-10 07:40:13
       ALARM CLASS:SWU-PER:001

          **  :LTG1 :LTU2 :115:  1   : 2 Q2174-X    STMD
     BST:01  FW: C360-L
       REASON:09H  LAYER 3 ACTIVE

       FORMAT:36
```

```
F5995 M4 N5400 IN SERV  BPA   CIRCUIT  B CHANNEL VC OK
   97-02-10 07:40:13
       ALARM CLASS:SWU-PER:001

          **  :LTG1 :LTU1 :055:  0   : 0 Q2235-X    VCM-
B15   BST:01  PLS:-B3
       FORMAT:22
       10000102FFFFFFFFFFFFFFFFFFFFFFFF
 FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
 FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
 FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFF
```

5) The VCM board at the remote system has been activated, but STMD trunk 1 (VCM B-channels 8-15) is out of service.

```
F5418 M4 N5412 IN SERV  BPA   CIRCUIT  LX ACTIVE
  97-02-10 07:46:19
       ALARM CLASS:SWU-PER:001

          **  :LTG1 :LTU1 :055:  0   :15 Q2235-X    VCM-
B15    BST:01  PLS:-B3
       REASON:09H  LAYER 3 ACTIVE

       FORMAT:36

F5994 M4 N5413 OUT SERV BPA   CIRCUIT  B CHANNEL VC DEF
   97-02-10 07:46:19
       ALARM CLASS:SWU-PER:001

          **  :LTG1 :LTU1 :055:  0   : 0 Q2235-X    VCM-
B15    BST:01  PLS:-B3
       FORMAT:22
       10000102FF00FFFFFFFFFFFFFFFFFFFF
 FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
 FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
 FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
       FFFFFFFFFF
```

6 INCDR (Internal and network-wide call detail recording) - Basic Information

6.1 Call Detail Recording

6.1.1 General Information

Call detail recording (INCDR = internal and network-wide call detail recording) is responsible for recording, outputting, and processing charge and call data for the purpose of determining costs and billing them for certain communication services. This refers to outgoing (trunk, tie) and incoming external connections as well as to internal connections. CDR (Call Data Recording) performs charge calculation for external connections without charging information from the line or for internal connections. This charge calculation uses a cost parameter (CARRIER and ZONE). The costs here are determined by amount or time unit. This parameter is determined by call processing; it is always passed when CDR is started (ZONE=EMPTY means there are no charges).

IMPORTANT: Call detail recording functions are only possible via LCR (Least Cost Routing), which means that all routes must be set up over the LCR AMOs (AMO WABE, AMO RICHT, AMO LODR, AMO LDAT, and AMO LDPLN).

The call processing determines the cost parameter in the following cases:

- for outgoing traffic by using LCR route information
- for incoming traffic by reading the cost parameter from the static station line memory
- for internal traffic, depending on the ITR group.

With each initial start of the CDR, a call ID (node number + consecutive number), which is determined by the call processing, is assigned. This call ID is used for the internal or network-wide identification of call detail records.

The CDR information that the CDR function uses when computing the costs can be displayed on terminal devices with display. This display is updated in the following cases:

- each time call detail information arrives from a line
- on expiration of a central timer in CP (Call Processing) during charge computing.

  There is a feature function block "Cost UNIT Identification" (COSTI), which can be started from all equipment (voice and non-voice terminal devices, trunks) over a program interface, so the new requirements do not have to be implemented on all OpenScape 4000 equipment. This function block handles the interface between the CDR function and the display of the charges (see the following figure "Interface Call Processing - Call Detail Recording").

  Tasks of the function block:

- Uniform program interface for all calling equipment
- Storage of call processing data for call detail recording

- Handling of the interfaces to the CDR
- Reporting the charges for display on terminal devices (non-device-specific)
  - Creating the totals for displays for multiple call charge records
  - Timer-controlled when computing costs
  - When call detail information arrives from the lines
- The size of the memory in COSTI is the same as the size of the memory in the CP buffer. Therefore there should be no blocking.
- After a soft restart, no more data is displayed for existing internal connections.

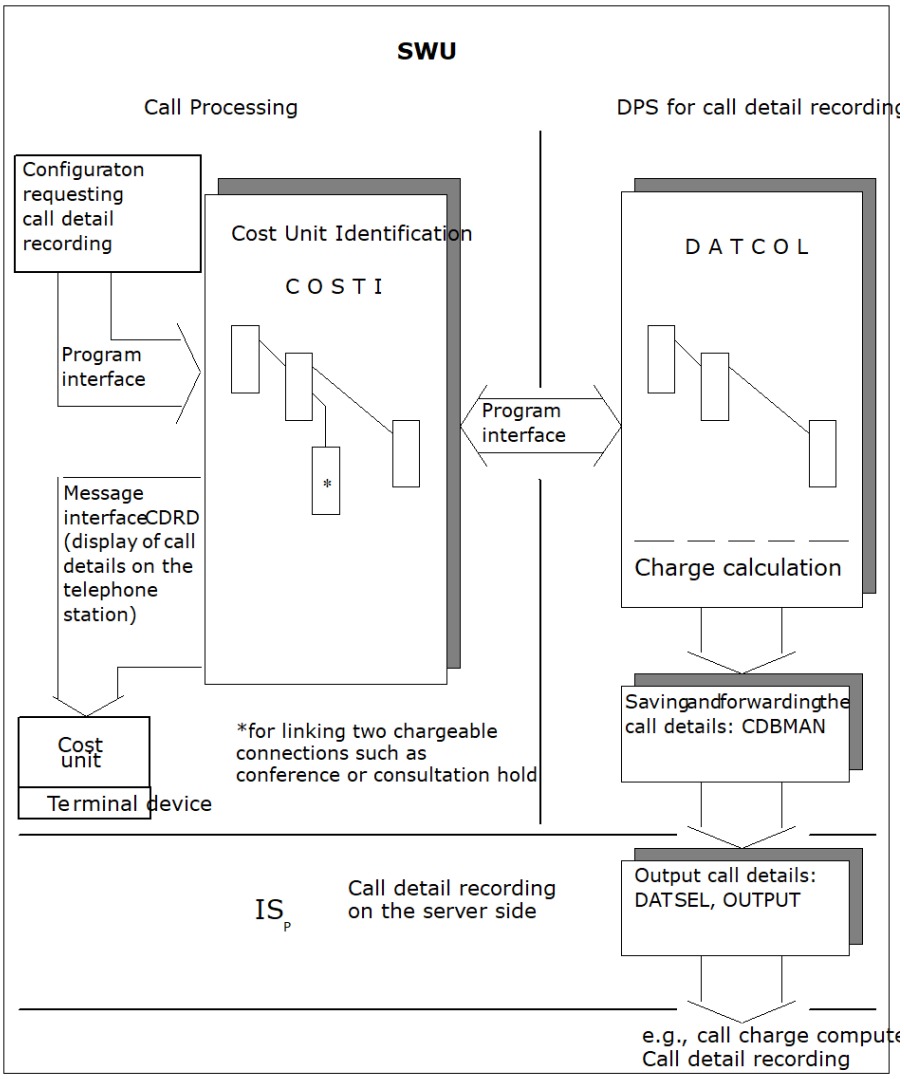


Figure 78: Interface between Call Processing and Call Detail Recording

6.1.2 Call Detail Recording Features

- Individual display on terminal device (AOC)
  - Display on a voice terminal device of the total of the current call charges for the call charge amounts of each connection. The counting starts with

the 1st counting pulse; the display is switched off after a configurable time (default is 5 s).
  - CDRD for voice, fax, data.
- Charge display for each connection on attendant console (CDRA)
  - Display of the call charges and call data on the attendant console screen.
  - Call charge display on console is done only when there is CDRA class of service.
  - When the call ends, the charge data or call data of the station that has the GEP class of service is logged on the attendant console. When there are queries, the internal or external station number, the units or the amount is displayed.
  - Plain-text output to a printer is possible.
  - CDRA is possible for voice, fax, and data.
- Call charge display at the night answering position
  - CDRD at the night station and connection of a printer are possible.
- Immediate output of call charges to external data medium (CDRC)
  - The output device can be a printer, the hard disk, the operating terminal, the data channel (DPS), or a call charge computer (CCU/GC3001A, see separate service handbook).
  - A selected and formatted call detail unit record is output.
- Call charge output by call-up on auxiliary devices (CDRC)
  - Output of the call detail data without analysis on auxiliary devices and DPS (CDRC with call-up). Call detail data analysis on the call charge computer (CCU/GC3001A).
- Call charge output to FT file
- Call detail recording and calculation for internal traffic
- Call detail recording and charge calculation for incoming trunk calls and inter-PBX traffic
- Call detail recording and charge calculation for outgoing inter-PBX traffic (networking)
- Call detail recording and charge calculation for Euro-ISDN trunk
- Charge calculation of the call charges on Digite display
- LCR expensive warning

6.1.3 Call Detail Recording Overload Behavior

The call detail data is temporarily stored in a call detail data pool on the SWU so that there is no loss of call detail data if there is an ISp outage or outage of an output device. The size of the memory depends on the system type. The ECX is designed for the temporary storage of a maximum of 3800 CDR records. Every other type of system is designed for the temporary storage of a maximum of 2200 CDR records. When the limits of this memory capacity are reached, no more call detail data can be temporarily stored and call detail data is lost. Therefore, to minimize the loss of call detail data for outgoing trunk calls (expensive connections), the internal connections are no longer recorded once the call detail data pool has been filled to 75% of its capacity. Before this point is reached, appropriate error messages (alarm messages) are sent.

6.1.4 Relevant AMOs for Call Detail Recording

Table 20: AMOS for Call Detail Recording - Description of the Parameters

AMO	Parameter	Lang.	Description
COSSU			Classes of service
	CDPRINT	E	Internal call detail recording
	CDRA	E	Call detail recording, attendant (ATND)
	CDRSTN	E	Immediate display of call charges on telephone
	CDRS	E	Individual call detail recording for the station
	CDRC	E	Central call detail recording for the station
	PUPHON *)	E	Public telephone
	SCRNCA *)	E	Station A without charges (creates a data record without charges)
	SCRNCB *)	E	Station B without charges (creates a data record without charges)
	SCRSPC *)	E	Station with special call detail recording (used in special cases)
	MTEQ *)	E	Maintenance device (used in special cases)
COT			Class of trunk
	CDBO	E	Call detail recording for breakout to carrier network
	IICB	E	Ignore incoming charges The cost unit and the TRANSWB bit (AMO LDAT) received from the billing element are not used.
	CDRI	E	Call detail recording for incoming connections
	SNBE	E	Do not send billing elements (cost unit is the station number plus node number)
	CATR	E	Transmit call charges transit
	AOCC	E	Call charge data transmission by connection; must always be set for CORNET-NQ and QSIG.

AMO	Parameter	Lang.	Description
	CDRD	E	If this parameter is set, the transmitted class of service for the line is not used for the call charge data transmission; instead the permanently set class of service in the circuit's COS is used. With carriers, this controls whether the service AOC (Advice of Charge) is released for the customer. The parameter has nothing to do with the call detail recording for the terminal device.
	IGID	E	Ignore the call ID (for example, for call detail recording) for incoming connections. The received call ID is ignored and a new one is assigned (for example, to the carrier's network boundary).
	ICZL	E	Incoming call detail recording over zone or line. For call detail recording in incoming traffic, the calculation of the call charges is performed according to zone tables (tariff tables) or according to incoming charge information (messages) from the line. The ICZL and ICZO parameters are mutually exclusive.
	ICZO	E	Activate incoming call detail recording by circuit. The ICZL and ICZO parameters are mutually exclusive.
	NCDR	E	Suppress signaling of CDR-E-specific messages.
	NCHD	E	No call charge messages during the call.
	NCHG	E	ATND without charges. The subscriber is not charged for a call to the ATND (MFC). AMO FEASU parameter NOCHRG feature must be set.
	DPRE	E	If the parameter is set, the dialing that was actually sent out (for example, including prefix digits, AMO LODR, OUTPULSE) is passed along to the call detail recording function.
CTIME			Call processing timers

AMO	Parameter	Lang.	Description
	DISPCH	E	Time interval for updating the call charge display with CDRD (INCRD feature). The timer for the periodic call charge display. Update of the call charge display at stations at selected time interval. The selected value is only a guideline that can also be exceeded when the SWU is fully occupied because of high priority processes. Note: If the parameter is too low, the processor load will be very high. If the parameter is too high, there will be jumps in the call charges.
	CDRDISDE	E	Clear call charge display for CDRD (call charge display on the display of the digital voice terminal). The time controls the continuation of the display after the idle state occurs on the Digite.
	PREEMT	E	Preemption: higher-level switching time for clearing outgoing connections if no one answers during a recall (because of call charge pulses)
DAGR			Administration of CDR file parameters
DAVF			Display properties when outputting call charges to the attendant console
DEFPP			Define paying party (cost unit)
DEFTM			Define traffic measurement
DIMSU			Feature quantities
	COSTI	E	Size of dynamically allocated connection memory for connections with call detail recording. Note on dimensioning: COSTI = CPB. Then the charges can be recorded on all outgoing trunk calls and tie trunks. If you want to record incoming connections and internal calls as well, you must increase the value.
	CPDBUF	E	Size of the dynamically allocated CP data buffers.
FBTN			Administration of the flag byte table and the line number table

AMO	Parameter	Lang.	Description
FEACG			Call detail recording features (bit string)
FEASU			Central features
	CDRE	E	Call data recording enhancements This allows for detailed output of the CDR records.
	NOCHRG	E	Free of charges (applies to incoming MFC-R21, for example, feature Switzerland for free fault services)
	CDROGTR	E	Record call charges for outgoing trunk calls. Call detail recording for outbound connections (trunk calls and tie trunk traffic) is always set using Least Cost Routing (LCR) parameters. The VOICE/ FAX/ DATA services are normally treated in the same way as far as the call charges are concerned. Because LCR is configured according to service, each service can be allocated a different cost parameter.
	CDROGNW	E	Record call charges for outgoing network-wide traffic (tie trunk traffic); see also parameter CDROGTR.
	CDRINH	E	Record call charges for internal traffic. For internal connections in nodes, you allocate the cost parameters to the internal traffic restriction groups (ITR groups). Use AMO VBZGR to allocate the cost parameter ZONE (INT01 to INT09, EMPTY) to the ITR groups, using the chargeable station's cost parameter of the ITR group for the call detail recording. Use AMO TTBL to configure the ZONE itself.
	CDRIC	E	Record call charges for incoming network and trunk calls.
	CDRA	E	Call detail recording at the station (not analyzed)
	DISCHTR	E	Display call charges for incoming and outgoing trunk calls on the station display
	DISCHINH	E	Display call charges for internal traffic on the station display
	DISCHNW	E	Display call charges for incoming and outgoing network-wide traffic on the station display

AMO	Parameter	Lang.	Description
	CPS	E	Transmission and measurement of call charge pulses (on the SLMAR card) The SLMAR card provides 8 analog ports for all basic features that are offered on analog lines, as well as three features (loop extension, CDR pulse transmission, and line test) for a few special countries.
FETA			Administration of tables of public and national holidays
FTBL			Administration of output format tables
GEFE			Administration of CDR parameters
GETAB			Retrieval of the CDRS file on auxiliary devices
GETPD			CM deletion of CDRS files
GEZAB			Call charge data display on auxiliary devices
GEZU			Administration of device allocation tables
GRZW			Administration of the connection limits table
KNMAT			Administer node data for networking
KNPRE			Administer node prefix table
LDAT			Administration of LCR destinations
	CARRIER	E	Carrier; must always be entered together with the ZONE parameter
	LATTR	E	LCR attributes
	ZONE	E	LCR zone; must always be entered together with the NETZBETR parameter
RCUT			Administration of the route code conversion table
SELG			Administration of selection groups and selection tables

AMO	Parameter	Lang.	Description
SELL			Administer the station and destination number lists
SELS			Switching the selection groups
TABT			Administration of rate period tables
TACSU			Configure analog trunk circuits
	CARRIER	E	Carrier (for cost computation) When calculating costs for incoming connections, the trunk circuits can be allocated cost parameters that are made up of CARRIER and ZONE. CARRIER and ZONE, which always work in combination, must be parameterized with AMO TTBL.
	COS	E	Class of service
	COTNO	E	Class of trunk
	CDRINT	E	Limiting value for call charge pulse integration. This value indicates the number of call charge pulses that are picked up in the device handler before they are passed to the call detail recording function.
	NNO	E	Node number (fictitious node number or node number of the destination system). The node number identifies the partner node. You can omit leading zeros. Zeros at the end indicate any node in an area.
	MFCVAR	E	Type of MFC This parameter allocates the MFC type to the circuit.
	ITR	E	Internal traffic restriction group
	ZONE	E	Distance zone for call charges based on time. When calculating costs for incoming connections, the line circuits can be allocated cost parameters that are made up of CARRIER and ZONE. You must use AMO TTBL to parameterize CARRIER and ZONE, which always work in combination. The empty zone, for which no charges are incurred according to time, is assigned by default.
TDCSU			Configure digital trunk circuits

AMO	Parameter	Lang.	Description
	CARRIER	E	Carrier (for cost computation) See above for a detailed description (AMO TACSU parameter CARRIER).
	COS	E	Class of service
	COTNO	E	Class of Trunk
	NNO	E	Node number (fictitious node number or node number of the partner system). See above for a detailed description (AMO TACSU parameter NNO).
	ITR	E	Internal traffic restriction group
	ZONE	E	Distance zone for call charges based on time. See above for a detailed description (AMO TACSU parameter ZONE).
TEXT			Administration of CDR text output tables
TLZO			Administration of the station allocation table
TTBL			Administration of the tariff tables
VBZGR			Allocation of the respective destinations (zones for call detail recording) to the internal traffic restriction groups
	TYPE	E	Branch parameters: CHRGINT (call detail recording for internal calls) and CHRGINC (call detail recording for incoming calls)
	ZONE	E	Zone allocation for call detail recording for internal and incoming calls
ZAND			Administration of central system data
	TYPE=CCD	Log dialog fields	Settings for call charge display on the terminal device and attendant console

Classes of service marked with *) are only to be released for specific countries for the feature public exchange telephone with call charge pulses.

6.1.5 Cross-References between AMOs and the AMO SELG

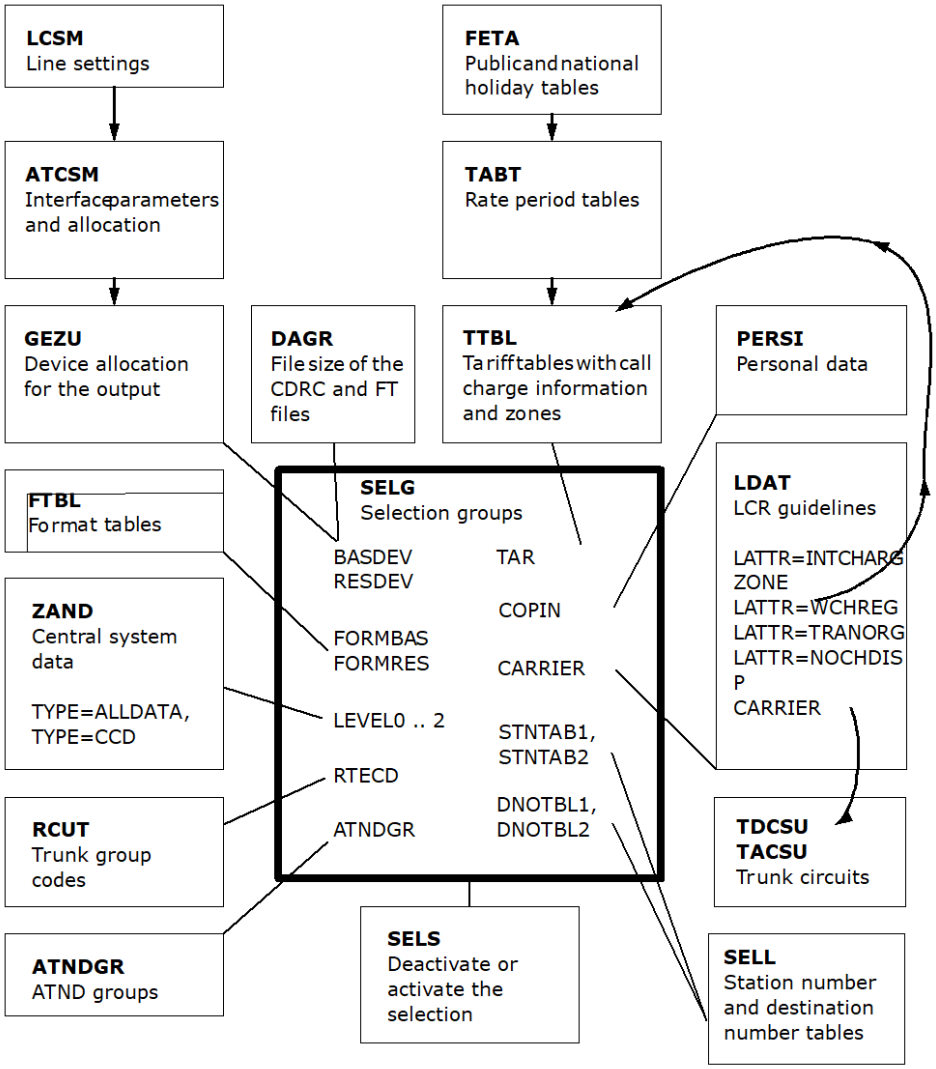


Figure 79: AMOs for Call Detail Recording - cross-references to AMO SELG

6.1.6 Types of Call Detail Recording

6.1.6.1 Internal Traffic

For internal traffic, call detail recording and charge calculation are possible for the following features: base call, consultation hold, transfer/pickup, three party conference, toggle, call pick-up, forwarding/call forwarding - no answer, executive intrusion, and callback.

6.1.6.1.1 Voice

Connections to special equipment (such as dictation equipment, paging equipment, etc.) are also recorded. Feature activations are not recorded if no voice transfer results (such as call waiting).

Connections with the attendant console (ATND) are only registered if the ATND is on the called side.

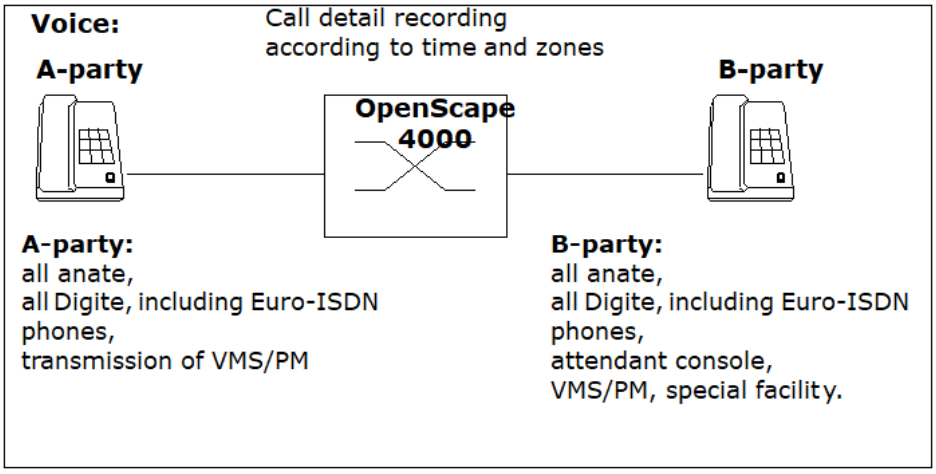


Figure 80: Configuration for internal traffic

Configuring system features

AMO FEASU

• CDRINH	Record call charges for internal traffic.
• DISCHINH	Display call charges for internal traffic on the station display
• CDRA	Call detail recording at station (ATND)

Configure station-specific features

AMO COSSU

• CDPRINT	Recording for the station with the COS no. ...
• CDRSTN	Immediate display of call charges on the terminal device
• CDRA	Call detail recording at attendant (ATND)

Configuring zone values

AMO VBZGR

• TYPE	Branch parameter for call detail recording for incoming calls (CHRGINT)
• ZONE	Zone allocation for call detail recording for internal calls (INT01-INT09)

Configure tariff tables

AMO TTBL

- Configure tariff group table

```
TAB=GRP: GROUPNO, CARRIER (=0), CATPTY, SERVICE,
 TARTBLNO
```

- Configure tariff table without call charge information

```
TAB=WOCU: TARTBLNO, ZONE (=INT01-INT09), INTDAY,
 TARDAY,
INTNT1-INTNT4, NTAR1-NTAR4, TARBAS, TARMIN, SEGTBLNO,
 CHPER
```

Configure timers

AMO CTIME

• DISPCH	Update period of the station call charge display, in seconds
• CDRDISDE	Duration of the call charge display after end of call (in seconds)

6.1.6.1.2 Non-Voice

Fax connections are recorded in the call detail recording for internal traffic under the "Fax" service and data connections are recorded under the "Data" service.

The type of the service ("fax" or "data") is registered in the call detail record.

Under the "data" service, no subdivision is done according to data transmission speed or according to special data service type, such as X.21 or synchronous/ asynchronous.

Internal calls of the following device types are recorded for non-voice calls:

- Euro-ISDN (S0 and S2)
- DCI and DCI-compatible devices
- Modem at an SLMA interface and on the a- and b-interfaces of an S0 terminal adapter (Euro-ISDN).

6.1.6.2 Incoming Trunk Calls and Tie Trunk Traffic

You can configure the call detail recording for all types of analog and digital lines. For the charge calculation, a cost parameter is used that you can configure for each trunk using the administration. The system specifies the clock.

During an incoming Euro-ISDN call, any charges announced with AOC-S (Advice of Charge (Setup) = charge notification at the start of the connection), AOC-D (charge notification during the connection), or AOC-E (charge notification at the end of the connection) are used for charge calculation in the call detail recording.

During an incoming analog call with call charge units, a CDR record can be recorded if needed. However, this does not result in any cost billing (collect

call). Information may be missing in the CDR records if this information is not transmitted by the remote analog station.

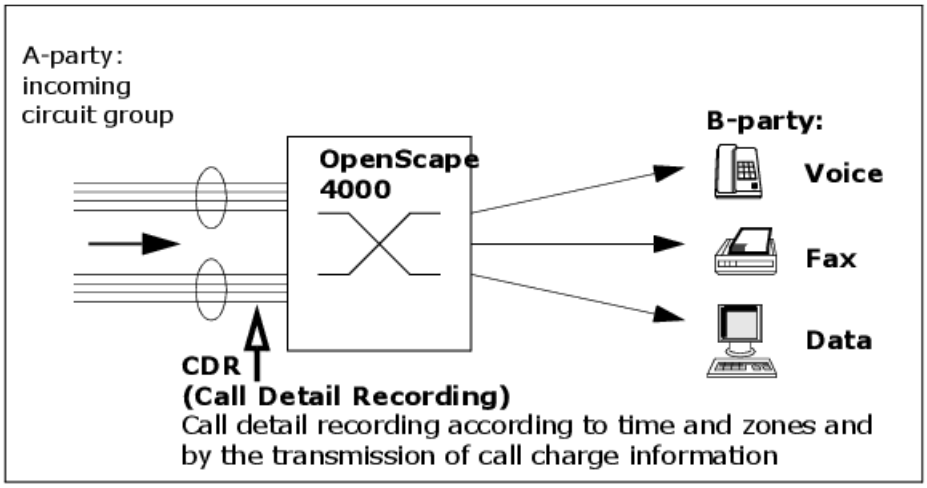


Figure 81: Configuration for incoming tie trunk traffic

Configuring System Features

AMO FEASU

• CDRIC	Record call charges for incoming network and trunk calls.
• GESPAM	Display call charges for incoming trunk calls on the station display
• DISCHNW	Display call charges for incoming network-wide traffic on the station display

AMO COT

• ICZL	Incoming CDR over zone or line
• ICZO	Activate incoming call detail recording by circuit
• TRSC	The line sends charge amounts to the originating node (valid for INCDR. If TRSC is not set, units are reported to the originating node so that the value UNIT is set there as the system date with AMO ZAND, TYPE=CCD, parameter CDDISPEX.

AMO TACSU / AMO TDCSU

• CARRIER	Carrier (for cost computation) (1 - 9) When calculating costs for incoming connections, the trunk circuits can be allocated cost parameters that are made up of CARRIER and ZONE. CARRIER and ZONE, which always work in combination, must be parameterized with AMO TTBL.

• ZONE	Distance zone for call charges based on time (EMPTY, INC01 - INC09) When calculating costs for incoming connections, the line circuits can be allocated cost parameters that are made up of CARRIER and ZONE. CARRIER and ZONE, which always work in combination, must be parameterized with AMO TTBL. The empty zone, for which no charges are incurred according to time, is assigned by default.

AMO TTBL

- WOCU

  Tariff tables 1 - 25 **without** charge information (ZONE=INC01 - INC09)
- WCU

  Tariff tables 1 - 25 **with** charge information (pulse tariff 0, 23 ....)

6.1.6.3 Outgoing Tie Trunk Traffic (Networking)

Call detail recording is possible for all analog and digital line types in the services "voice", "fax" and "data". It is performed on the basis of routing-dependent cost parameters (LCR = Least Cost Routing).

You can configure the LCR cost parameter for each LCR route element. This LCR cost parameter is used for OpenScape 4000 internal and external call charge calculation as well as for the control of the Digite display.

The networking call detail recording is always started, regardless of the connection type and regardless of the features used to make the connection. This means that not only the standard features are taken into consideration, but also all country-specific features.

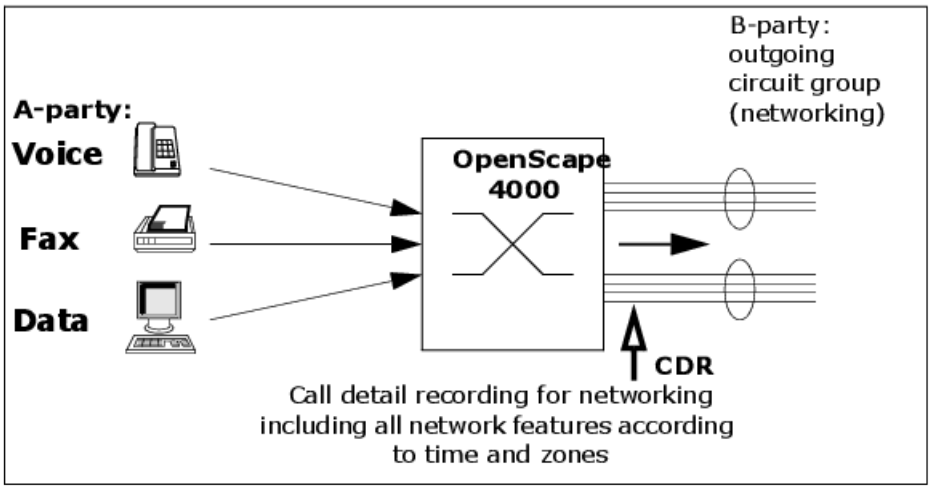


Figure 82: Configuration for outgoing tie trunk traffic

6.1.6.3.1 Configuring System Features for Outgoing Tie Trunks

AMO FEASU

• CDROGNW	Record call charges for outgoing network-wide traffic (tie trunk traffic: also see CDROGTR)
• DISCHNW	Display call charges for outgoing network-wide traffic on the station display

AMO LDAT

- see Section 58.6.3.2, "Configuring System Features for Outgoing CO"

AMO COT

- see Section 58.6.3.2, "Configuring System Features for Outgoing CO"

6.1.6.3.2 Configuring System Features for Outgoing CO

AMO FEASU

• CDROGTR	Record call charges for outgoing trunk calls Call detail recording for outgoing connections (trunk calls and tie trunk traffic) is always set using Least Cost Routing (LCR) parameters. The voice/fax/data services are normally treated in the same way as far as the call charges are concerned. Because LCR is configured according to service, each service can be allocated a different cost parameter.
• DISCHTR	Display call charges for outgoing trunk calls on station display

AMO LDAT

CARRIER	Carrier; must always be entered together with the ZONE parameter (1 - 9)	
ZONE	Values: EMPTY, SHORT, LOCAL, LONG01 - LONG49, ABROAD01 - ABROAD99, TIE01 - TIE09, INTERN01 - INTERN09	
LATTR	LCR attributes	
	Possible values:	
	WCHREG	Activate call detail recording
	EODSTCDR	Call detail recording starting at the end of dialing
	INTCHARG	External charges like internal
	NOTRANS	Transit node without charges
	NOCHDISP	Suppress display in the case of expensive warning

AMO COT

• DPRE	If the parameter is set, the dialing information that was actually transmitted (including, for example, prefix digits, AMO LODR, OUTPULSE) is passed to the call detail recording function (destination number with prefix digit to DATCOL).

6.1.6.4 Call Detail Recording for Networking

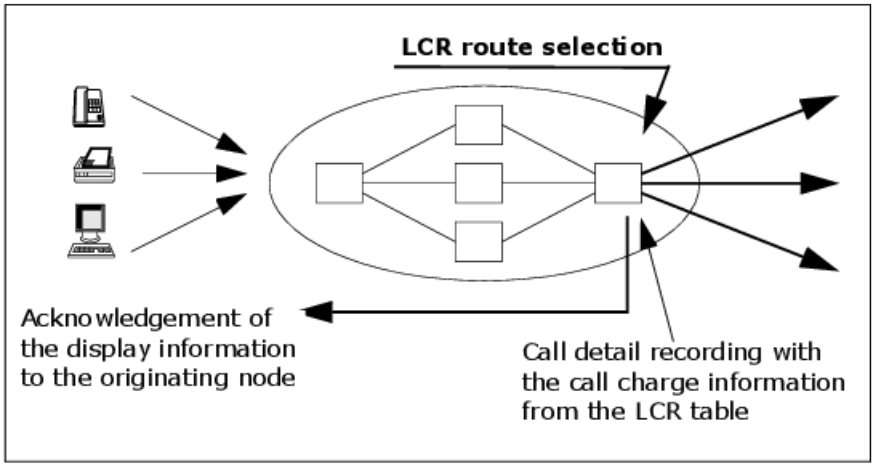


Figure 83: Call detail recording for networking

The following points have been implemented in call detail recording in networking:

- Call detail recording with the help of route-dependent and routine-dependent cost parameters (least cost routing parameters)
- You can configure the LCR cost parameter for each LCR route element.
- This LCR cost parameter is used for OpenScape 4000 internal and external call charge calculation as well as for the control of the Digite display. The cost parameter is not available for old routing.
- Transmission of the call charge information for a Digite display network-wide to the A-party's originating node
- The LCR AMOs determine when and where a call is recorded.
- Call detail recording and charging of networking connections are always done in the node in which the lines or trunk to be recorded are allocated.

6.1.6.5 Network-Wide Call Detail Recording With Call ID

Network-wide connections can be identified with the help of a call ID, which can be stored in the call data records. This makes it possible to link together call data records that stem from a connection's different recording locations (measurement at different path sections of a network-wide connection) at a later time for offline analysis of the call data records and for computing the costs.

The call ID has two levels and has a thread ID and a global ID: the thread and global IDs contain a three-level node number and a counter (sequence number). The call ID is assigned during the first call processing operation.

The thread ID does not change throughout the entire connection (even network-wide) and can therefore be consulted for a summary of all CDR records that belong to a connection.

The global ID changes with each call step such as transfer, call forwarding, etc.

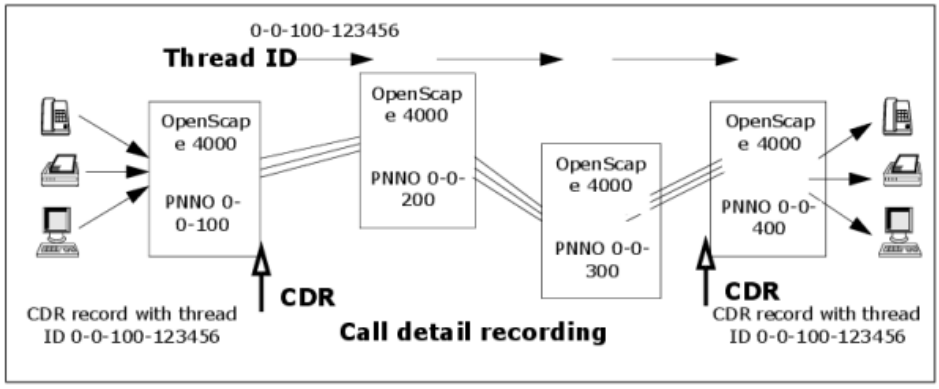


Figure 84: Network-wide call detail recording with thread ID

6.1.6.6 Euro ISDN Trunk

With the feature 'Euro-ISDN', the charge message from the trunk at the beginning of the connection (AOC Setup) is not only taken into account for the Digite display but is also processed in the call detail recording for the OpenScape 4000 internal charge calculation and in the external accounting management (call charge computer).

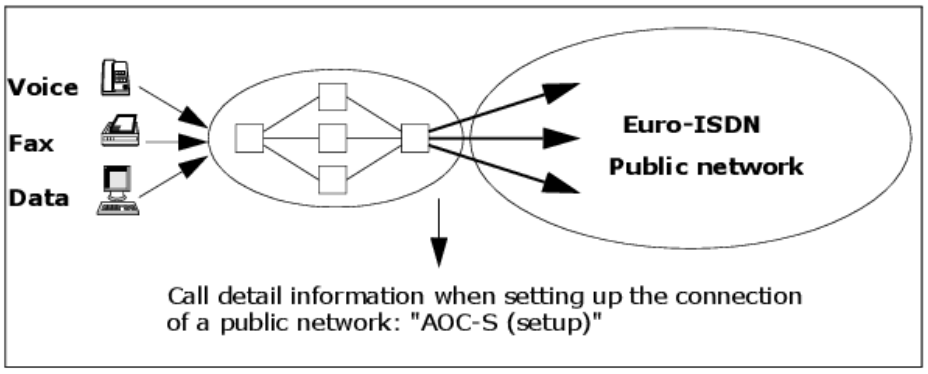


Figure 85: Euro-ISDN trunk

The following types of recording have been implemented for the network-wide transmission of a Euro-ISDN trunk's charge information to the originating node of the A-party for a Digite display

- AOC-S

  Call detail information while setting up the connection or during the connection (for example, 20 s =1 unit or 30 s =0.20 EUR)
- AOC-D

  Call detail information during the call (units or amount).
- AOC-E

  Call detail information when the call ends (units or amount).

6.1.7 Call Charge Display on the Digite

The CDRSTN class of service (call charge display at the telephone station) is needed to display the call charges at the station.

The call charge display is updated periodically. You can adjust the time interval between updates throughout the system with the help of a configurable timer. The call charges are displayed during the call and at the end of the call.

The charge notification from OpenScape 4000 to the Euro-ISDN telephone connection occurs during the call and at the end of the call, but not at the beginning of the connection when it is being switched. The charge notification occurs if the connection is made under the "Voice" service and if the Euro-ISDN telephone connection's station has been assigned the CDRSTN class of service.

If a Digite station has two chargeable connections (for example, during a consultation hold), the display shows the total of the charges that apply, regardless of the different types of costs (trunk call, inter-PBX traffic, or tie trunk traffic).

Primary and secondary calls on Digites are handled as separate connections. The respective charges are displayed separately. They are not added together. This type of call occurs when one call is taken over from another call with the help of call pickup, for example, after call waiting.

- **Call charges for internal calls**

  The costs that result from the length of the call and the cost parameter are shown on the Digite display during an internal call. This is configured for internal connections for each ITR group of a system.
- **Call charges for "incoming trunk and tie trunk"**

  The costs that result from the cost parameter are displayed. This cost parameter is configured for each trunk by Administration (accounting of call charges based on time).

  IMPORTANT: However, this does not mean a general release of the Digite call charge display for incoming connections for any given country-specific analog lines.

- **Call charges (CDRD) during a networking connection on the basis of route-dependent cost parameters**
  - The costs that result from the length of the call and the cost parameter are shown on the Digite display. This is configured for each selected routing trunk group for LCR connections (cost parameter depending on LCR route element).
  - LCR expensive warning signaling helps prevent a false call charge display on the Digite caused by an expensive route selection. This means that the "normal" call charges are displayed for a "normal" route and that the expensive warning signaling prevents the wrong call charge display when an expensive route is selected to remote nodes (for example, during break-out).
- **Call charges (CDRD) during a connection over the Euro-ISDN trunk**
  - The charge notification from the Euro-ISDN trunk to OpenScape 4000 to the Euro-ISDN telephone connection occurs at the end of the call and possibly during the call.

6.1.8 Types of Charge Calculation

The charge calculation has been adjusted to meet the new Euro-ISDN requirements and the requirement for a calculation done without call charge units. The following types of charge calculation are used:

- Charge calculation for internal traffic over internal zones (maximum of 9); the zones can be allocated by ITR group. The cost parameter of the ITR group in which the chargeable station is located always applies.
- Charge calculation with call charge units (price/call charge unit)
- Charge calculation with amounts (factor)
- Charge calculation for Euro-ISDN with cost parameters that are reported by the trunk (AOC-S, AOC-D, and AOC-E).
- Charge calculation without charge information based on cost parameters (CARRIER and ZONE) and length of the connection.

You can assign different prices for variable clocks (for example, for n sec. connection duration) for each cost parameter and time of day (which can also vary for each cost parameter). Different rate period tables and minimum and basic charges can be taken into account for each cost parameter.

If the network signals charge information, this information is included when calculating the charges.

The charge calculation is done centrally in the call detail recording. The calculated charges are passed on to the call processing and shown on the telephone station's Digite display (CDRD).

6.1.9 Data Recording

To perform call detail recording, all of a connection's relevant data must be known. Sometimes this data is obtained in phases of a connection that are widely spread out over time. Therefore, it must be collected step by step for each connection.

A "connection block" is available for collecting this data. A connection block is allocated to each connection. The identification is based on the trunk number and the communication service. This allocation does not change for the duration of the connection.

Two exceptions must be noted however:

- If a new paying party appears during a call, a new connection block must be opened for this party. The old party is handled as if there is an end-of-connection.
- The procedure is the same if a limiting value (charges or time) is reached.

Creating a standard data record:

Information is collected in the connection block (CB) during a connection.

- Calculation of the connection duration.
- If necessary, conversion of the cost unit using a table (only for ATND or MTLC).
- Change of the communication service from "voice" to "fax" when the fax class of service is set.
- Transmission of all necessary data in the standard data record.

Then the standard data record is transferred to the data selection function for further processing.

6.1.10 Data Selection

The data selection programs offer the operators of systems with call detail recording the capability of adjusting the data output of certain connections according to internal company requirements concerning the existing output capabilities (devices).

These then continue the processing of data records that were recorded by the data recording function and that were entered into memory especially reserved for this purpose at the end of the connection or section.

Selection sequence:

The selection processes each connection block or the standard data record that results from it. This is also true for standard data records that result from connection attempts (for example, station is busy in the trunk).

The basis of the selection process is the selection field, which is divided into 4 so-called selection groups (see AMO SELG).

Each selection group corresponds to an independent output unit with definable device allocation, where the outputs for "Display at attendant console" (or several attendant consoles) or each HD file are considered as one device.

Selection field

Table 21: Selection field

GROUP 1	GROUP 2	GROUP 3	GROUP 4

Selection group

Table 22: Selection group

POOL_PART	RES_OUT_WO_QUE
DEV_BAS	DEV_RES
BLOC_BAS	BLOC_RES
SEL_GR_STATE	SEL_TAB

The following parameters are allocated to each of these selection groups.

- POOL_PART

  Number of reserved elements (queue entries) in the CDB pool
- RES_OUT_WO_QUE

  Mode of operation for the reserve output
- DEV_BAS

  Device indicator for basic operation
- BLOC_BAS

  Number of data records per output procedure (basic)

- DEV_RES

  Device indicator for reserve operation
- BLOC_RES

  Number of data records per output procedure (reserve)
- SEL_GR_STATE

  Operating state of a selection group
- SEL_TAB

  Field of 8 selection tables

  Each selection group (1-4) taken into service compares the connection characteristics of the standard data record with the customer-specific characteristics given in its 8 selection tables. If a connection characteristic within a selection group applies, the standard data record is processed by the next selection group, regardless of the decision (output/no output). Multiple outputs (to the same device) are thereby eliminated even if overlapping characteristics are entered.

  It is possible to make multiple outputs (parallel outputs) of a standard data record to different devices if there are additional selection groups with the same characteristic combination in the selection tables.

  Selection table

  A selection table contains 13 fields.

  Table 23: Selection table

FORM_BAS	FORM_RES	CALC_LIST
DEST_LIMIT	LIMIT_CHARGES	LIMIT_TIME
MEMB_ROUT_CODE	MEMB_SERV_IND	MEMB_ATT_GR
POP1	POP2	NODE_TBL
	COPIN	CARRIER

  Elements:
- OUT_IND: output indications. Consists of the fields FORM_BAS, FORM_RES, CALC_LIST, DEST_LIMIT. The CALC_LIST field contains the new tariff group number, which is used during the charge calculation.

  Mode: DA_M_CGS_TA_OUT_IND_STR
- LIMIT_CHARGES: limiting value for call charge units; output occurs if this value is exceeded.

  Mode: DA_M_CONN_CHRG_UNIT_RNG
- LIMIT_TIME: limiting value for the duration of the connection; output occurs if this value is exceeded.

  Mode: DA_M_CG_TIME_STR
- MEMB_ROUT_CODE: routing code

  Mode: DA_M_CGS_MEMB_ROUT_ARY
- MEMB_SERV_IND: service with which output occurs (network type, transmission speed)

  Mode: DA_M_CGS_SERV_IND_PST

- MEMB_ATT_GR: statement for selecting a maximum of 16 ATND groups.

  Mode: DA_M_CGS_MENGE_ATT_GR_PST
- POP1: connection and class of service codes

  Mode: DA_M_CG_MARK1_PST
- POP2: limiting values

  Mode: DA_M_CGS_TA_MARK2_PST
- NODE_TBL: node number table (the node numbers are expanded to 4 places)

  Mode: DA_M_CGS_NODE_NO_ARY
- COPIN: Class of Pin

  Mode: POWERSET(DB_M_COPIN_RNG)
- CARRIER

  Mode: POWERSET(DB_M_CP_CARRIER_RNG)

6.1.11 Selection Group Operating States

One condition considered when deciding whether the selection table of a selection group checks a CDR record that is entered in memory is the current operating state of the respective selection group, among other conditions. This is why the corresponding state parameters are allocated to each selection group. They can be changed by administration and maintenance orders (AMO SELS).

This makes it possible to activate and deactivate call charge recording and CDR displays indirectly by means of the output of a selection group without device intervention (at times).

Operating states of selection groups (see also AMO SELS):

- State 'ON'

  The selection group is activated. Output should be performed with the allocated selection tables of the selection group. If a processed CDR record is to be output, it is linked into the output queue of the selection group and thereby released for output.
- State 'OFF WITH QUE'

  The selection group is conditionally activated. The CDR record is processed and linked in the output queue as in the state "ON". However, the output is blocked until the selection group is reset to the operating state "ON" or "OFF WITHOUT QUE". All CDR records that, in case of output, are already linked to the output queue at this time or that will be entered in this operating state in the future, are put in safekeeping for output for as long as the memory capacity of the overflow memory or the group's individual memory is not reached. If the memory capacity is reached, output starts on the reserve device.

  In this operating state, maintenance work can be done on the allocated basic output device without any loss of the output data of this selection group.
- State "OFF WITHOUT QUE"

  The selection group is conditionally deactivated. In this operating state, no processing is done to a CDR record in the selection tables of this selection group, so there is no output. However, all CDR records that are already

linked in the output queue at the time of the removal from service are still output. For block output, this can result in the formation of a partial block.

- State 'OFF'

  The selection group is deactivated. In this operating state, there is no processing of CDR records in the selection tables of this selection group. All CDR records that are linked in the queue at the time of the removal from service are deleted.

6.1.12 Validity Check of the Selection Entries

To guarantee smooth sequencing of both the selection processing and the output, AMO SELG – which processes and updates the selection tables – carries out a validity check on the changed selection entries, especially the output indication.

A selection group is only released for operation if the result of the validity check is positive or, in certain cases, if it can be corrected. Wrong, incomplete, or invalid entries always lead to an error message, even when corrected.

6.1.13 Data Output

The output is divided into the following two functional units.

- Immediate Output

  In immediate output, outputs to a device (such as printers, AM-WIN) or outputs to long-term memory (hard disk) are executed as soon as the connection is ended. In immediate output, the CDR records are copied to the output format or, when storing on the hard disk, the CDR record is stored with some supplementary data.
- Data Output on Demand

  The call charge data, which is temporarily stored on the hard disk, is output at a time defined by the customer. This output can take place one time or periodically. The prerequisite is that an AMO has been used to configure a dialog field for this job.

6.1.13.1 Immediate Output

Immediate output is divided into the following components:

- **Data preprocessing**
- **Formatting**
- **Output control**

- **Charge calculation**

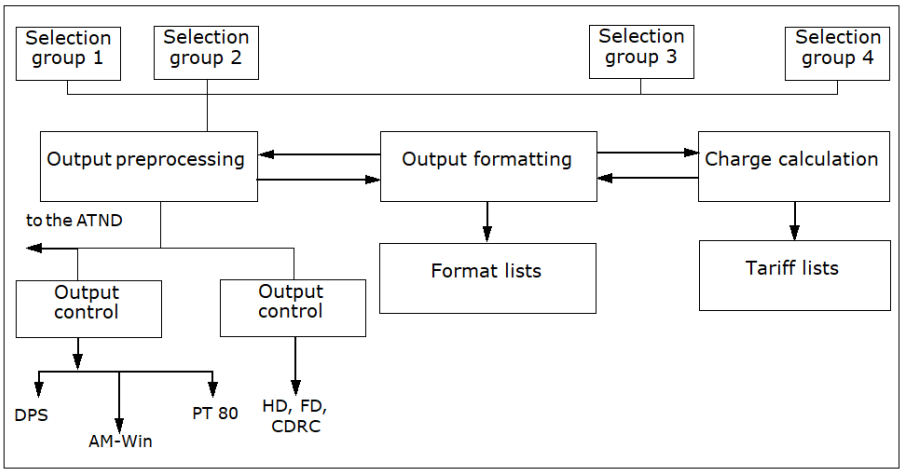


Figure 86: Overview of the selection

- **Data preprocessing**

  The job of the data preprocessing is to configure the data records or formatted data blocks in an output block according to the parameters entered in the selection group.

  The relevant output control takes over the output of this output block to the requested output medium, depending on the selection group entries.

  The following restrictions have been made for treating the attendant console as an output device:

  – An attendant group can have n-1 ATNDs.
  – The maximum number of attendant groups is 16

  If the base device is the same as the attendant console (ATND), no reserve device is permitted. If the base device is another output device, the reserve device can be an attendant console (ATND).

  Formatting

  The formatted (EBCDIC or ASCII code) CDR records can be transferred at any time via fast file transfer (FT SINX and other file transfer programs that are released for OpenScape 4000) to DMS or other applications. The OpenScape 4000 call detail recording files that the CDR records are filed in the requested customer format in an FT file (file transfer file). You can configure the format of the data records in the file with the help of AMOs. At a time specified by the customer or when the file has reached its maximum size, the file is closed and copied under a name specified by the customer. This file is then available for file transfer. After this file has been transferred with file transfer, it must be deleted, but not by call detail recording function.

  If the file is still present at the time of the copy operation, an alarm message is issued. The new file is then attached to the old file. If the file is not picked up, attachments are made until the memory capacity limits are reached. After this, data is lost.

  When there is a restart or reload during the copy operation, the appropriate data must be saved in a scratch file to prevent any duplicate or incomplete

data records when attaching. This data is used so that the file does not contain any mutilated data records.

The storage in the "FT file" is done either by the selection (for immediate output) or by output of the call charge data from the CDRC file to the "FT file".

The output records resulting from the formatting can be transferred to any device controller and any transfer procedure (including DPS channel), even if there is no device-specific data. The outputs that run to the ATND contain data that is converted in the switching unit to code appropriate for output. The processing and compilation of the variable output format data is laid out in format lists. These format lists consist of individual elements (see AMO FTBL).

Output control

Each output control uses programs, which vary according to the device to be connected, for configuring and processing different types of files. The files are output in any computer units or programs to the following:

– TTY (asynchronous terminals)
– DPS (connection of a data processing system)

Charge calculation

The task of charge calculation is to calculate the charges for each connection on the basis of the call data recorded in the CDR record using the tariff from the selection table. The type of charge calculation differs for the different communication services and is therefore handled in several subcomponents (see AMO TTBL).

- **Notes on the output devices**

  The zone parameter of the CDR record has 54 domestic and 99 foreign zones and 9 zones for internal, incoming, and tie trunk traffic.

  Because of the large amount of data when recording the internal connections, it may be necessary to output the call charge data quickly to a fast output device. To do this, use an AMO to enter the appropriate notice ("output to fast output device") in the call data recording bit string. If this bit is set, the call charge data selection is done only with the first selection group. The remaining selection groups are deactivated. In this case, temporary storage in a CDRC file (as reserve device) is also not possible. This limitation to one output device and one selection group makes it possible to achieve a considerably higher output speed.

  You can configure one basic and one reserve device for this one output. Possible or useful combinations:

  – DPS and magnetic tape (MT)
  – DPS and FT file (file transfer)
  – Magnetic tape (MT) and FT file
  – FT file and MT

  Storage for later retrieval (CDRC file) is not possible.

6.1.13.2 Data Output on Demand

Output on demand includes carrying out the dialog for the creation of the output orders, the selection of the stored CDR records, and the provision of

the selected CDR records for output. There are 8 dialog fields provided for the output; these can be used for both CDRS/CDRC and the call charge computer.

Unlike immediate output, output on demand allows the user to define the time of the call data output.

The user creates the output order by dialog. The following types or orders are possible:

- One-time orders (simple/multiple single order)
  - With a simple single order, there is exactly one output at the time the user defines.
  - With multiple single orders, the user can specify a maximum of 3 different output times.

  Periodic orders (simple/multiple standing orders)
  - With a simple standing order, the user issues dialog commands to specify the time of the first output and the period for the repeated outputs.
  - For multiple standing orders, the user specifies a maximum of three different output times and exactly one period. Each of the maximum of 3 orders is then repeated periodically. Hours, days, or months are allowed as periods (minimum value of the period is 1 hour, maximum value is 12 months).

  Additional parameters when creating an output order - along with the output time and period - are as follows:
  - CDR file
  - File beginning and end
  - Output device
  - Format table (AMO FTBL)
  - Tariff table (AMO TTBL)
  - Identifier indicating whether the data records should be deleted after successful output.
  - Identifier indicating whether a forced output of the CDR file is required. If there is a file overflow, a forced output can be arranged. However, the file is only printed if the "forced order" code was set in one of the dialog fields during configuration. If no "forced order" code was set, the forced order is ignored (AMO GEZAB).

  The parameters of the completely created dialog commands are saved in a dialog field and transmitted to the scheduled batch job processing function.

  In addition to creating an output order, the CDRC dialog offers the following functions:
  - Cancel output order (scheduled batch job)
  - Cancel outputs
  - Output (log) dialog fields

6.2 Call Detail Transmission

It is strongly recommended the connectivity is made via the Customer Lan (CLAN) and not the OpenScape 4000 Atlantic Lan (ATLAN).

Through using the CLAN, the Linux firewall only allows communication to the outside world through specific ports, thus protecting the internal ATLAN communication from external issues that can affect telephony stability.

The flexibility of using CLAN also allows any CDR collection devices to be in an independent LAN segment. It is understood, legacy installations that previously used the ATLAN will continue to do so.

6.2.1 Requirements for Call Detail Transmission to the DPS

Depending on the administration of the OpenScape 4000 system, data can be recorded over all outgoing, incoming, and tie trunk connections, and also over internal connections, and then prepared for call detail tracing. This makes it possible to output connection and call detail data. A data processing system (DPS) coupled over the data channel reachable over customer LAN is available as the output device. The Layer 4 protocol is ISO8073 Class 0 (RFC1006).

NOTICE: ATOS DOES NOT SUPPLY ANY APPLICATION WHICH CAN HANDLE DPS OUTPUT!!

This section describes configuration details for the transmission of data concerning the individual connections (individual call data) over the data channel to the DPS.

The following general possibilities for transmitting this data to the DPS exist:

- Immediately after each connection ends (immediate output) initiated by OpenScape 4000,
- After temporary storage of the data in OpenScape 4000

NOTICE: THIS USE CASE IS NOT RECOMMENDED ANY MORE! IF NO REALTIME PROCESSING IS NECESSARY FTFILE AND COLLECTING AGENT MUST BE USED. THESE MECHANISMS PROVIDE MUCH MORE FLEXIBILITY AND FURTHER PROCESSING CAPABILITIES.

  - On demand, initiated by the DPS,
  - Upon the expiration of a (periodic) scheduled batch job in OpenScape 4000 initiated by OpenScape 4000,
  - Upon overflow of the call detail file in OpenScape 4000 (forced output) initiated by OpenScape 4000.

  A configuration example for OpenScape 4000 is given in Section 59.3.1, "Example configuration of an immediate DPS output over customer LAN".The DPS receiver application parameters have to fit with the OpenScape 4000 configuration according to ISO8073 specification.

6.2.2 Transmission of Individual Call Data

The transmission of individual call data is a part of the OpenScape 4000 system feature "Call detail recording, central (CDRC)".

You must use AMO GEZU (device allocation) to configure the name of the DP application that is to receive the data. You may configure only one DP application name.

The content of the CDR record is freely configurable by AMO FTBL. The records are encoded in EBCDIC and the length of a single record must not exceed 1020 bytes.

IMPORTANT: If the DPS system fails, the output to other selection groups is also stopped and the CDR data is buffered as long as the output to DPS system is defective! A workaround would be the configuration of a reserve output device (e.g. FTFILE, see Section 59.3.1, "Example configuration of an immediate DPS output over customer LAN", step 4) to avoid this blockage.

The transmission of the data to the DPS can occur either immediately after a connection ends (immediate output) or after temporary storage in OpenScape 4000 (output on demand, this feature is deprecated. FTFILE and Collecting Agent should be used instead). For output on demand a dialog field has to be configured by AMO GEZAB (configuration of the central call detail data extraction). It is also important that you suitably coordinate the DP application and the OpenScape 4000 behaviour with one another according to ISO8073.

Regarding the CDRC1 and CDRC2 files (which due to poor performance compared to FTFILE usage is not recommended any more). These two hard disk files :CGD:GEZSFILE1 and :CGD:GEZSFILE2 are SAM files and are available for the temporary storage of the data in OpenScape 4000. Together they can currently accept a maximum of 130,000 data records. Each separate CDR file can store a maximum of 65,000 data records. The standard value of the file size for the CDR files (AMO DAGR controls administration of the CDR file parameters) is between 30,000 and 40,000 CDR records. Taking these boundary conditions into account, you can define the size of the CDR files with AMO DAGR as needed.

6.2.3 Message Sequences for Transmitting Individual Call Data

There are different message sequences for transmitting data over the data channel:

1) Immediate output after the end of a connection *initiated by OpenScape 4000*
2) (NOT RECOMMENDED ANY MORE). Data retrieval initiated by the DPS. If CDR records are stored in GEZSFILE1 and GEZSFILE2 then it is possible for the application to initiate the output. If no realtime processing is necessary the Collecting Agent provides much more flexibility in CDR data processing.

A separate logical connection must be set up between OpenScape 4000 and the DPS receiver application.

The DPS receiver application must always be ready to accept a connection setup from OpenScape 4000 (if there is not already a connection). Although normally the application initiates the connection and then receives and processes the CDR records, if the connection is lost OpenScape 4000 will create a new connection to the DPS system, so the DPS system must be able to handle connect requests.

If you have configured immediate output, once a connection is made, that connection is sustained. If it has been cleared down for any reason it is set up again as soon as the next data record is ready.

The DPS receiver application sets up and clears down the connection to the OpenScape 4000. During the connection, the following messages are exchanged:

1) OpenScape 4000 → DPS

OpenScape 4000 sends a data block with call data records to the DPS. This record is EBCDIC encoded and the length must not exceed 1020 bytes.

2) DPS → OpenScape 4000

The DPS receiver application acknowledges the receipt of the CDR information, and simultaneously indicates ready for next retrieval with the Data Indication message "A1011" (for description of the available messages see "Appendices C Example Coding for DPS output" under "OpenScape 4000, Call Detail Recording, Service Documentation").

If OpenScape 4000 does not receive the confirmation within 30sec the actual CDR record is sent again.

6.2.3.1 Example configuration of an immediate DPS output over customer LAN

In the following we give an example of the OpenScape 4000 configuration of a CDR output to a DPS system. Only the DPS specific components are stated, it is assumed that CDR is already configured and running.

Customer LAN address of OpenScape 4000: 192.168.0.103

IP address of DPS PC in customer LAN: 192.168.0.253

1) The LAN connection between ADP and PC receiving via Assistant routing functionality must be configured. The name of the connection is freely choosable, but in order to use the routing functionality the SRCPORT must be 102.

```
ADD-CPTP:DPCON,7,"FREEBSD","192.168.0.253";

ADD-CPTP:APPL,13,"LANGUE1","FREEBSD","LANGUE1",
YES,102,5096,"SRC","DST";
```

2) The CDR DPS device has to be assigned to the connection configured in step 1:

```
ADD-GEZU:DP,DP,V24HDLC,HDLC,"LANGUE1 ","FREEBSD "
,"LANGUE1 ";
```

3) CDRCDUMP bit has to be set in AMO FEACG. Normally this bit is already set for output into FTFILE:
`ADD-FEACG:CDRCDUMP;`

4) Configuration of a selection group for output to DPS device and activation of the selection group is required. The selection group configuration is the same as for output to FTFILE, but the base device is DPS:

```
ADD-SELG:SELG,3,N,DPS,NODEV,1,0;
CHANGE-SELG:SELT,3,1,FORM06,NOFORM,TARGR00,A22;
CHANGE-SELG:SELT,3,1,,,,,0&&999999;
CHANGE-SELG:SELT,3,1,,,,,,VOICE ;
```

```
CHANGE-SELG:SELT,3,1,,,,,,0&&15;

CHANGE-SELG:SELT,3,1,,,,,,,,ALL,ALL,N,N,N,N,N,N,N,
N,N,N,N,N,N,N,N,N,N;

CHANGE-SELG:SELT,3,1,,,,,,,,,,,,,,,,,,,,,,,,,,0,
000000;

CHANGE-SELG:SELT,3,1,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
0&&999,0&&254,0&&30;

CHANGE-SELG:SELT,3,1,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
N,N,INTERN&INCO&OUTG&ACACT&LOAD,0&&15,0&&9,ALL;

ACTIVATE-SELS:3;
```

The previous example has no reserve device, which means that the CDR records are buffered if the DPS is defective. This means that remaining active selection groups are also blocked to avoid a data loss on DPS system. To avoid this blockage a reserve device can be configured. In the example below we use reserve device=FTFILE and the same output format. If an output to FTFILE is already existing the record from the DPS system will be IN ADDITION to the "normal" records and must be ignored by the application processing the FTFILE data:

```
ADD-SELG:SELG,3,Y,DPS,FT,1,0;
CHANGE-SELG:SELT,3,1,FORM06,FORM06,TARGR00,A22;
CHANGE-SELG:SELT,3,1,,,,,0&&999999;
CHANGE-SELG:SELT,3,1,,,,,,VOICE ;
CHANGE-SELG:SELT,3,1,,,,,,,0&&15;

CHANGE-SELG:SELT,3,1,,,,,,,,ALL,ALL,N,N,N,N,N,N,N,
N,N,N,N,N,N,N,N,N,N,N;

CHANGE-SELG:SELT,3,1,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,0,
000000;

CHANGE-SELG:SELT,3,1,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
0&&999,0&&254,0&&30;

CHANGE-SELG:SELT,3,1,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
N,N,INTERN&INCO&OUTG&ACACT&LOAD,0&&15,0&&9,ALL;

ACTIVATE-SELS:3;
```

5) Configuration of the output format FORM06 referenced in the selection group from step 4 (Length must not exceed 1020 Bytes):

```
ADD-FTBL:6,B,FORM,1,N,"A##@@#@@#@#@@@@@@@@@@@@@@@@@@
@@@##@@@@@#@@#@@#@#@@";

ADD-FTBL:6,B,FORM,2,N,"@@@@@@@@@@@@@@@@@@@##@#@#@#@#@
#@@@#@@@@#@@#@#@@@@@";

ADD-FTBL:6,B,FORM,3,N,"@@#@@@@#@@#@@#@@#@@#@@@@@@@@@@
@@@@@@@";
```

```
ADD-FTBL:6,B,CTRL,4,N,CR;
ADD-FTBL:6,B,CTRL,5,Y,LF;
ADD-FTBL:6,B,FIELD,1,RECTYPE,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,2,CALLILV0,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,3,CALLILV1,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,4,CALLILV2,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,5,CALLIPTY,CHAR," ",L;
ADD-FTBL:6,B,FIELD,6,CONNTYPE,CHAR," ",L;
ADD-FTBL:6,B,FIELD,7,CONSECT,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,8,DESTLV0,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,9,DESTLV1,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,10,DESTLV2,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,11,DESTPTY,CHAR," ",L;
ADD-FTBL:6,B,FIELD,12,END10,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,13,ENDDAY,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,14,ENDHOUR,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,15,ENDMIN,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,16,ENDMONTH,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,17,ENDSEC,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,18,ENDYEAR,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,19,QUEUEDUR,CHAR," ",R;
ADD-FTBL:6,B,FIELD,20,RINGDUR,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,21,SUPLSERV,CHAR," ",L;
ADD-FTBL:6,B,FIELD,22,THRESEQ,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,23,TKNOREAL,CHAR," ",R;
ADD-FTBL:6,B,FIELD,24,TKNOTRGR,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,25,PPLV2,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,26,PPLV1,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,27,PPLV0,CHAR,"0",R;
ADD-FTBL:6,B,FIELD,28,CHRGEE,CHAR," ",L;
```

6.2.4 Messages When Transmitting Individual Call Data

The following describes the different messages for the transmission of individual call data:

- Send CDR information,
- CDR information block on demand or with immediate output,
- Bad or good CDR information end,
- CDR information processed,
- CDR data retrieval request
- Repeat the same call data record (immediate output),
- Verification of connection ("heartbeat").

The record identifier unambiguously identifies each message.

The message contents are represented in EBCDIC. Numerical message elements are to be interpreted as decimals in EBCDIC strings.

The setup of the messages is defined. However, you can use AMO FTBL (format table administration) to configure and change the format and the content of the actual connection and call detail data within the data blocks (data records with record identifiers "AA", "AB", "AH" and "AI") so that it is customer-specific.

The separate data elements of the messages are summarized and explained in Section 59.5, "Types of Elements When Transmitting Call Detail Data".

6.2.4.1 Message "Send CDR Information"

Direction:

DPA → OpenScape 4000

Format:

Fixed format

Table 24: Data Record "Send CDR information", Direction: DPA -> OpenScape 4000

RID	REF	Start of time frame	End of time frame
2	2	10	10

Description

Table 25: Description of Data Elements for "Send CDR information", Direction: DPA -> OpenScape 4000

Position (byte)	Name	Value	Description
1 – 2	RID	"A0"	Record identifier (see Section 59.5.1, "Elements with a Fixed Specification")
3 – 4	REF		Reference (see Section 59.5.1, "Elements with a Fixed Specification")
5 – 14			Start of the time frame in format yymmddhhmm *); if dd = 00, the time frame starts with the start of the file
15 – 24			End of the time frame in format yymmddhhmm *); if dd = 00, the time frame ends with the end of the file

*)	All components of the data should be right justified with leading zeros.
	If the entire contents of the file should be sent, the information concerning the start and end of the time frame can be left out completely.
	If the year yy entered is #≤ 80, it is considered to be in the 21st century and if yy > 80 it is considered to be in the 20th century (for example, yy = 00 corresponds to 2000; yy = 99 corresponds to 1999).

6.2.4.2 Message "CDR information block on demand" or "CDR information block with immediate output"

Direction

OpenScape 4000 → DPA

Format:

Only the record identifier (Record ID) and, for the first record, the reference (REF) have a fixed definition. You can put the rest together in any way from the data elements defined in Section 59.5.2, "Configurable Elements". Furthermore, you can configure the length, justification, fill character, and, if needed, decimal separation character (decimal point or comma) of these elements. Examples of possible formats are given in the following.

Setup of the first data record in a block (Example)

Table 26: Setup of the First Data Record in a Block (Example), Direction: OpenScape 4000 -> DVA

RID	REF	BLENBYT	Output-Time	BLENREC
2	2	4	10	3

Description:

Table 27: Description of Data Elements for "CDR information block on demand or for immediate output", Direction: OpenScape 4000 → DPA

Position (byte)	Name	Value	Description
1 – 2	RID	"AA" "AH"	Record identifier (see Section 59.5.1, "Elements with a Fixed Specification") on demand For immediate output
3 – 4	REF	"00" "01" "02"	Source of the data to be transmitted for immediate output CDR1 file CDR2 file
5 – 8	BLENBYT		Length of the entire block in bytes right justified, with leading zeros *)
9 –10	OUTYEAR		Date of the output: year (right justified, with leading zeros*))
11 – 12	OUTMONN		Date of the output: month (right justified, with leading zeros*))
13 – 14	OUTDAYN		Date of the output: day (right justified, with leading zeros*))
15 – 16	OUTHOUR		Date of the output: hour (right justified, with leading zeros*))

Position (byte)	Name	Value	Description
17 – 18	OUTMIN		Date of the output: minute (right justified, with leading zeros*))
19 – 21	BLENREC		Number of the data records following in the block; (right justified, with leading zeros *)

*)	The coding information (length, justification, and fill character) applies to the present example.

Setup of the data records following in the block (example):

Format

Table 28: Setup of the *following* data records in the block (example)

RID	L	SWP	STNID	CHRGEE	PIN	TKNOLIST
2	4	2	1	6	12	6

Table 29: Setup of the *following* data records in the block (example)

ROUTCN	DESTPTY	NETTYPE	SERVICE	SPEED	CHRGUNIT
2	22	1	1	1	4

Table 30: Setup of the *following* data records in the block (example)

End-of-connection	Call duration	MSGNO	SIGDATA
13	7	5	1

Description

Table 31: Description of the Data Elements for "CDR information block on demand or for immediate output", Direction: OpenScape 4000 → DPA

Position (byte)	Name	Value	Description
1 – 2	RID		Record identifier (see Section 59.5.1, "Elements with a Fixed Specification")
		"AB"	On demand
		"AI"	For immediate output
3 – 6	L	"0084"	Length of the following data in bytes ***)
7 – 8	SWP	" 1"... "11"	Partial switching procedure **)

Position (byte)	Name	Value	Description
9	STNID	"1"... "5"	User ID **)
10 – 15	CHRGEE		Party charged for the connection left justified, filled with blanks *)
16 – 27	PIN		Personal id left justified, filled with blanks *)
28 – 33	TKNOLIST		Fictitious circuit number (trunk no. list) right justified, with leading blanks *)
34 – 35	ROUTCN		Trunk group code right justified, with leading blanks *)
36 – 57	DESTPTY		Newly selected or through connected destination for a connection. left justified, filled with blanks *)
58	NETTYPE	"1"... "3"	Output of the network description **)
59	SERVICE	"1"... "6"	Output of the service **)
60	SPEED	"1"... "6"	Output of the transmission speed **)
61 – 64	CHRGUNIT		Call charge units right justified, with leading zeros *)
65 – 66	ENDYEAR		End-of-connection: year (right justified, with leading zeros*))
67 – 68	ENDMONTH		End-of-connection: month (right justified, with leading zeros*))
69 – 70	ENDDAY		End-of-connection: day (right justified, with leading zeros*))
71 – 72	ENDHOUR		End-of-connection: hour (right justified, with leading zeros*))
73 – 74	ENDMIN		End-of-connection: minute (right justified, with leading zeros*))
75 – 76	ENDSEC		End-of-connection: seconds (right justified, with leading zeros*))
77	END10		End-of-connection: 1/10 seconds (right justified, with leading zeros*))
78 – 79	CONHOUR		Call duration: hours (right justified, with leading zeros*))

Position (byte)	Name	Value	Description
80 – 81	CONMIN		Call duration: minutes (right justified, with leading zeros*))
82 – 83	CONSEC		Call duration: seconds (right justified, with leading zeros*))
84	CON10		Call duration: 1/10 seconds (right justified, with leading zeros*))
85 – 89	MSGNO		Message's consecutive number right justified, with leading zeros *)
90	SIGDATA	"1"... "2"	Identification whether the data record is correct, incorrect, or duplicate **)

*)	The coding information (length, justification, and fill character) applies to the present example.
**)	The coding given for the values applies to the present example. The appropriate code for the possible values of the element must be set with AMO TEXT.
***)	This length is not one of the configurable data elements. It is set up as field with constant contents.

6.2.4.3 Message "Good/Bad CDR information end"

Direction:

OpenScape 4000 → DPA

Format:

Fixed format

Table 32: Data record for "Good/Bad CDR information end", direction: OpenScape 4000 → DPA

RID	REF
2	2

Description

Table 33: Description of the Data Elements for "Good/Bad CDR information end", Direction: OpenScape 4000 → DPA

Position (byte)	Name	Value	Description
1 – 2	RID		Record identifier (see Section 59.5.1, "Elements with a Fixed Specification")
		"AC"	Good
		"AD"	*) Bad
3 – 4	REF	"00" "01" "02"	Source of the transmitted data **) only possible for record identifier = "AD" CDR1 file CDR2 file

*) e.g.:	Incorrect block length, file not available, FTBL not generated, DPA retrieval is not set to "Yes", CGD: Area does not exist, etc.
**) e.g.:	No reference to CDR file in message "Send CDR information" or block length greater than 1020 bytes

6.2.4.4 Message "CDR information processed"

Direction:

DPA → OpenScape 4000

Format:

Fixed format

Table 34: Data Record for "CDR information processed", Direction: DPA -> OpenScape 4000

RID	REF	NRR
2	2	1

Description

Table 35: Description of the Data Elements for "CDR information processed", Direction: DPA → OpenScape 4000

Position (byte)	Name	Value	Description
1 – 2	RID	"A1"	Record identifier (see Section 59.5.1, "Elements with a Fixed Specification")

Position (byte)	Name	Value	Description
3 – 4	REF		Reference (see Section 59.5.1, "Elements with a Fixed Specification")
5	NRR	"0" "1"	New retrieval request Interrupt transmission Request for next block or acknowledgement of "AC.." / "AD.."

6.2.4.5 Message "CDR data retrieval request"

Direction:

OpenScape 4000 → DPA

Format:

Fixed format

Table 36: Data Record for "CDR data retrieval request", Direction: OpenScape 4000 → DPA

RID	REF	RRR
2	2	1

Description

Table 37: Description of the Data Elements for "CDR data retrieval request", Direction: OpenScape 4000 → DPA

Position (byte)	Name	Value	Description
1 – 2	RID	"AF"	Record identifier (see Section 59.5.1, "Elements with a Fixed Specification")
3 – 4	REF	"01" "02"	Notification of where to find the data to be transmitted CDR1 file CDR2 file
5	RRR	"1" "2"	Reason for the retrieval request Scheduled batch job in OpenScape 4000 Forced output

6.2.4.6 Message "Repeat the same call data record (for immediate output only)"

Direction:

DPA → OpenScape 4000

Format:

Fixed format

Table 38: Data Record for "Repeat the same call data record (for immediate output only)", Direction: DPA → OpenScape 4000

RID	REF	RR
2	2	1

Description

Table 39: Description of the Data Elements for "Repeat the same call data record (for immediate output only)", Direction: DPA → OpenScape 4000

Position (byte)	Name	Value	Description
1 – 2	RID	"W1"	Record identifier (see Section 59.5.1, "Elements with a Fixed Specification")
3 – 4	REF	"00"	Immediate output
5	RR	"1"	Request for repetition Request the same block

6.2.4.7 Verification of Connection ("Heartbeat").

The DPA can send this job to determine whether there is a logical connection. In the "good case", OpenScape 4000 acknowledges immediately, in the "bad case" OpenScape 4000 cannot react.

Job:

Direction:

DPA → OpenScape 4000

Format:

Fixed format

Table 40: Data Record for "Verification of connection ("Heartbeat")", Direction: DPA → OpenScape 4000

RID	REF
2	2

Description

Table 41: Description of the Data Elements for "Verification of connection ("Heartbeat")", Direction: DPA –> OpenScape 4000

Position (byte)	Name	Value	Description
1 – 2	RID	"A0"	Record identifier (see Section 59.5.1, "Elements with a Fixed Specification")

Position (byte)	Name	Value	Description
3 – 4	REF	"00"	No file

Acknowledge:

Direction:

OpenScape 4000 → DPA

Format:

Fixed format

Table 42: Data Record for "Verification of connection ("Heartbeat")", Direction: OpenScape 4000 → DPA

RID	REF
2	2

Description

Table 43: Description of the Data Elements for "Verification of connection ("Heartbeat")", Direction: OpenScape 4000 → DPA

Position (byte)	Name	Value	Description
1 – 2	RID	"AD"	Record identifier (see Section 59.5.1, "Elements with a Fixed Specification")
3 – 4	REF	"00"	No file

6.2.5 Types of Elements When Transmitting Call Detail Data

Each data record exchanged between OpenScape 4000 and the DPA in the framework of call detail recording consists of particular individual components, so-called data elements.

All elements are coded in EBCDIC. Numerical message elements are interpreted as decimals in EBCDIC strings.

You should distinguish between

- elements with a fixed specification such as record identifier, reference, and others,
- configurable elements. You can put together the configurable part of the data block format (see Section 59.4.2, "Message "CDR information block on demand" or "CDR information block with immediate output"") from these elements with AMO FTBL or AMO TEXT. You can set the length, justification, fill character, and decimal separation character (decimal point or comma), if any, for each element.

The elements with a fixed specification and those that are configurable are listed in detail in Section 59.5.1, "Elements with a Fixed Specification" and Section 59.5.2, "Configurable Elements".

6.2.5.1 Elements with a Fixed Specification

Table 44: Elements with a Fixed Specification

Name	Value	Description
RID		Record identifier
		A particular record identifier is unambiguously allocated to each message in connection with the transmission of connection and call detail data:
	"A0"	Send CDR information or Verification of connection
	"A1"	CDR information processed
	"AA"	Block start for output on demand
	"AB"	Call data record for output on demand
	"AC"	Good CDR information end
	"AD"	Bad CDR information end or Verification of connection
	"AF"	CDR data retrieval request
	"AH"	Block start for immediate output
	"AI"	Call data record for immediate output
	"W1"	Repeat the same call data record (for immediate output)
		Byte 1 of the record identifier contains the service identifier (for example, call detail recording), byte 2 contains the meaning and also the direction of the data record in question: data records going from OpenScape 4000 to the DPA are identified by letters, data records going from the DPA to OpenScape 4000 are identified by numbers.
REF		Reference
		The reference indicates the source of the data that is being transmitted or that is to be transmitted. Unless otherwise stated (see Section 59.5.1, "Elements with a Fixed Specification"), all reference entries within a message sequence must agree. The reference has the following meanings for the transmission of individual call data:
		Transmission of the data from
	"00"	No file (immediate output)
	"01"	CDR1 file without deleting

Name	Value	Description
	"02"	CDR2 file without deleting
	"03"	CDR1 file with deleting
	"04"	CDR2 file with deleting
		Deletion of the data without transmission from
Name	Value	Description
	"05"	CDR1 file (for SNA-RJE without end message) *)
	"06"	CDR2 file (for SNA-RJE without end message) *)
	"07"	CDR1 file (for SNA-RJE with end message) *)
	"08"	CDR2 file (for SNA-RJE with end message) *)
NRR	"0" "1"	New retrieval request Interrupt transmission Request for next block or acknowledge "AC", "AD"
RRR	"0" "1"	Reason for the retrieval request Scheduled batch job in OpenScape 4000 Forced output
RR	"1"	Request for repetition Request for the same immediate output record or block

IMPORTANT: To delete the data without transmitting it, use the values "05" and "06" in dialog operation (an end message is always implied in dialog operation). These two values indicate no end message only in the SNA-RJE operations, so the values "07" and "08" are still available. These two values allow the data to be deleted without transmission with end message, even in SNA-RJE operation.

6.2.5.2 Configurable Elements

IMPORTANT: The indication "(n-digit)" in an element refers to the possible information content (digits or characters) of the element in question. A shorter or longer length can be configured for the elements unless the entry in the table reads "max. n-digit".

Example 1:

The element CHRGEE (party responsible for connection costs) with the statement "(6-digit)" can, for example, be configured to be four digits. This is useful if the party responsible for connection costs (paying party) has only four digits. On the other hand, the field can also be configured as eight digits if, for example, the DP application is expecting an 8-digit field. In this case, 6 digits contain the actual value and the remaining digits contain the fill character.

For certain elements, you must use AMO TEXT to set up text strings for all possible values (while taking the number of possible digits into consideration).

Example 2:

For the element OUTDAYC (date of the output: name of the day of the week),

```
"MONDAY ", "TUESDAY ", "WEDNESDAY ", "THURSDAY " and so on
 (each 10 characters long)
 or "MO", "TU", "WE", "TH", and so on
 or the short form  "1", "2", "3", "4", and so on
```

can be set up as values.

Configurable Elements

Table 45: Configurable Elements

Name	Description
ACCTCODE	The call's account code. The user enters the account code either before or during the call (12-digit)
ACDAGTID	ACD Agent ID (6 characters). ID of an ACD Agent for an incoming or outgoing answered call
ACDGRPID	ACD Group ID (3 Zeichen). Group ID for an ACD call
ADPLOAD	Processor load of the ADP in 1/10 percent. This is the average load over 10 seconds (4-digit). The time stamp, showing when the load was determined, is in the field "end of connection"->ENDDAY (2-digit), ENDMONTH (2-digit), ENDHOUR (2-digit), ENDMIN (2-digit), ENDSEC (2-digit), END10 (1-digit).
AOCTYPE	Type of the call charge accounting message (10-digit) You can use AMO TEXT to set up text strings for this element, which can have the following values: Call detail information during the call (D_AOC) Call detail information when the call ends (E-AOC) Call detail information when setting up the connection (S_AOC)
ATNDGRNO	Attendant Group (2-digit) (see In the fields for incoming calls are:)
ATTCALLP	Attendant Call Priority - priority of a call in an attendant queue. Only available for ACWinMQ (2 characters)
ATTCALLR	Attendant Intercept Reason - only available for ACWinMQ (2 characters)
ATTCALLT	Attendant Call Type- only available for ACWinMQ (2 characters)
ATTQUEID	Attendant Queue ID - queue ID assigned to a call. Only available for ACWinMQ (2 characters)
BCHLCNT	Number of B channels (max. 2-digit). No longer maintained

Name	Description
BLENBYT	Block length in bytes (5-digit)
BLENREC	Number of records per block (5-digit) (The number of data records in the block with record ID = "AB" or "AI")
CALCTYPE	Type of billing used (10-digit) You can use AMO TEXT to set up text strings for this element, which can have the following values: Pay phone (RURAL) (CLOCK) Pulse or amounts from CO (PULSES) Accounting of call charges based on time (WOUT)
CALLEPTY	Called party: number that was dialed by the calling station. (22-digit)
CALLIID	Station ID of the calling party (text parameter STNID is defined in AMO TEXT) (10-digit)
CALLILV0	Node number of calling party (3-digit max.)
CALLILV1	Subdomain number of the calling party (max. 3-digit)
CALLILV2	Domain number of the calling party (max. 2-digit)
CALLIPTY	Calling party: party that initiated the existing connection/ segment. (22-digit)
CALLIONI	Originating network ID of calling party
CARRIER	Identifier for the communication network as text string (10-digit, see In the fields for incoming calls are: and In the fields for internal calls are:) You can use AMO TEXT to set up text strings for this element, which can have the following values: CARRIER_0 (internal) CARRIER_1 CARRIER_n CARRIER_9
CAUSE	Output of the cause of the clearing of a connection (3-digit, see table Meaning of the Values for the Element CAUSE in AMO FTBL)

Name	Description
CHOFCON	Output of the type of connection (10-digit, see In the fields for incoming calls are: and In the fields for internal calls are:) You can use AMO TEXT to set up text strings for this element, which can have the following values: Local connection Long-distance connection Local connection with exceeded limiting value Long-distance connection with exceeded limiting value No entry Rerouting / Routopt You can set up the limiting value for the number of the call charge pulses or the connection duration with AMO GRZW.
CHRGUNIT	Call charge units: The units in this field are recalculated from the calculated costs. (5-digit, see In the fields for internal calls are:)
CON10	Call duration: 1/10 seconds (1-digit)
CONCHRG	Output of the costs including sales tax. For calculation in 1/100th (max. 8-digit) For calculation in 1/100000th (max. 12 digits) OpenScape 4000 calculates this value according to the price per pulse set up with AMO TTBL (tariff table administration)
CONCHRN	Output of the net costs without sales tax. For calculation in 1/100th (max. 8 digits) For calculation in 1/100000th (max. 12 digits)
CONHOUR	Call duration: hours (2-digit)
CONMIN	Call duration: minutes (2-digit)
CONNSTEP	All of a connections's CDB records are numbered in order (starting with contents 1), (3-digit).
CONNTYPE	Output of the connection type as text string (10 characters, see In the fields for incoming calls are:). You can use AMO TEXT to set up text strings for this element, which can have the following values: Outgoing connections (OUTGO) Internal connections (INTERN) Incoming connections (INCO) Attendant activity (ACACT) Processor load (LOAD)
CONSEC	Connection duration: seconds (2-digit)
CONSECT	Connection duration, total in tenths of seconds (6-digit)

Name	Description
COPIN	Output of the PIN class (see AMO PERSI) as text string (10 characters) You can use AMO TEXT to set up text strings for this element, which can have the following values: No PIN available PIN Class_1 PIN Class_n PIN Class_8
CTRDIFF	CDRS difference counter, only CDRS functionality (5-digit)
CTRTOT	CDRS summation counter, only CDRS functionality (5-digit)
DESTLV0	Node number of the new or connected party, (3-digit)
DESTLV1	Subdomain number of the new or connected party, (3-digit)
DESTLV2	Domain number of the new or connected party, (2-digit)
DESTPID	Station ID of the new or connected party. It is not possible to determine the ID for dialed numbers. In this case, "unknown" is output. The text parameter STNID is defined in AMO TEXT (10 digits)
DESTPTY	connected party: Newly selected or through connected destination for a connection (22 digits).
DISPCHRG	Connection charges, including sales tax, shown on display. Calculated during the connection. For calculation in 1/100th (max. 8-digit) For calculation in 1/100000th (max. 12-digit)
DISPCHRN	Connection charges, not including sales tax, shown on display. Calculated during the connection. For calculation in 1/100th (max. 8-digit) For calculation in 1/100000th (max. 12-digit)
DNIS	Text string regarding the called party. Output of the Identification Service Number belonging to the dialed number. The DNIS number is provided by the BREAKIN trunk and refers to the called party (11-digit)
END10	End-of-connection: tenths of seconds (1-digit)
ENDDAY	End-of-connection: day (2-digit)
ENDHOUR	End-of-connection: hour (2-digit)
ENDMIN	End-of-connection: minute (2-digit)
ENDMONTH	End-of-connection: month (2-digit)
ENDSEC	End-of-connection: second (2-digit)
ENDYDAY	End-of-connection: day of year (1...366, 3-digit)

Name	Description
ENDYEAR	End-of-connection: year (4-digit)
EXPENS	Output of the identifier 'Expensive connection' as text string (10-digit) You can use AMO TEXT to set up text strings for this element, which can have the following values: Cheap Expensive Free A-station Free B-station
FACA	Values for FX or TTA trunk access on BREAKIN trunk as part of the NI2 PRI service (5-digit)
FACB	Values for FX or TTA trunk access on BREAKOUT trunk as part of the NI2 PRI service (5-digit)
FLAG1	No longer maintained
FLAG2	No longer maintained
GLOBLLV0	Node number of the global leg ID (3-digit), identical to LEGLV0
GLOBLLV1	Subdomain number of the global leg ID (3-digit), identical to LEGLV1
GLOBLLV2	Domain number of the global leg ID (2-digit), identical to LEGLV2
GLOBLSEQ	Sequence number of the global leg ID. A new global call ID is provided only when there is a new connection (8-digit), identical to LEGSEQ
GLOBLV0	Node number of the global call id, (3-digit)
GLOBLV1	Subdomain number of the global call id, (3-digit)
GLOBLV2	Domain number of the global call id, (2-digit)
GLOBSEQ	Global call ID: a number global call ID may only be created when a new connection is set up (8-digit).
HOLDDUR	Total hold time in 1/10 seconds (5-digit)

Name	Description
IDPP	Output of the CDRS station number as text string (10 characters) You can use AMO TEXT to set up text strings for this element, which can have the following values: Trunk circuit (TC) Main PBX tie trunk (MTLC) Station (STN) Attendant console (ATND)
INFOTYPE	Type of information (10-digit), If accounting call charges from CO, then units or amounts. You can use AMO TEXT to set up text strings for this element, which can have the following values: Amounts from CO (AMO UNT) Units from CO (UNITS)
INTNBCHA	B channel of the real trunk number of the location that is not recording
INTNLIST	Fictitious trunk number converted from INTNREAL (max. 6-digit, see AMO FBTN)
INTNREAL	Real trunk number of the location that is not recording (see TKNOREAL, 5-digit) Outgoing connection: A-station PEN or incoming circuit Incoming connection: B-station PEN or outgoing circuit Internal connection: same as private automatic branch exchange: B-station PEN Network-wide: A-station PEN or incoming circuit
INTNTRGR	Trunk number group of INTNREAL (real trunk number of the location that is not recording). If the location that is not recording is a telephone instead of a trunk, this has the value 0 (5-digit)
KEYLV0	Node number of the key line used party, (3-digit)
KEYLV1	Subdomain number of the key line used party, (3-digit)
KEYLV2	Domain number of the key line used party, (2-digit)
KEYPTY	Key line used party: the selected trunk (number) of a multi-trunk equipped with a key phone (22-digit).
LCALLENO	Length of the called number (called party), (2-digit)

Name	Description
LDESTNO	Length of the destination number (2-digit). The dialed selection number can be transmitted to the DPA either in its complete form or – for reasons of data protection – partly deleted; the partial deletion can be done in two ways: only the first n digits of the destination number are transmitted to the DPA the last n (of the actually dialed) digits are deleted You can use AMO SELG to select the method that you want to use.
LEGLV0	Node number of the leg id, (3-digit)
LEGLV1	Subdomain number of the leg ID, (3-digit)
LEGLV2	Domain number of the leg ID, (2-digit)
LEGSEQ	Leg ID: If the destination station is changed in an existing connection, a new leg ID is generated but the global call ID itself is not changed (8-digit).
PINLEN	Length of the personal ID (2-digit)
LISTTYPE	Output of the type of the CDRS output format as text string, only CDRS functionality (16 characters) You can use AMO TEXT to set up text strings for this element, which can have the following values: Individual call charge calculation (IND) Partial call charge calculation (PART) Total call charge calculation (TOTAL)
MOBUCLV0	Node number of mobile user calling party, (3-digit)
MOBUCLV1	Subdomain number of mobile user calling party, (3-digit)
MOBUCLV2	Domain number of mobile user calling party (2-digit)
MOBUCPTY	Mobile user calling party: the user identifies himself/herself at the called station with a PIN (22-digit)
MSGNO	Message's consecutive number of the S&F (Store & Forward) connection (5-digit)
NCT	Flag that shows that a network call transfer (NCT) was successfully performed. The transfer is done in the public network and all connections over the OpenScape 4000 are released. Because of this, it is no longer possible to record the accounting of call charges of the remaining call (1-char)
NETCARA	The trunk-related access code of the network carrier (related to the BREAKIN trunk) (4-digit)

Name	Description
NETCARB	The trunk-related access code of the network carrier (related to the BREAKOUT trunk) (4-digit)
NETPULS	Pulse: call detail information from the network (5-digit)
NETSVCA	Service for a long-distance call carrier that supplies the PRI rate call (call ends in the PBX); this service is used or requested for an incoming PRI rate call (2-digit)
NETSVCB	Service for a long-distance call carrier that supplies the PRI rate call (call ends in the PBX); this service is used or requested for an outgoing PRI rate call (2-digit)
NETTYPE	Output of the network description as text string (10 characters) You can use AMO TEXT to set up text strings for this element, which can have the following values: - Analog network (ANA) - Integrated Data Network (IDN) - Integrated Service Data Network (ISDN)
ORIGIPA	Originating IP Address of the call (15-digits)
OSAA	Operator system access for incoming trunk connections (area 0-2) (1-digit)
OSAB	Operator system access for outgoing trunk connections (area 0-2) (1-digit)
OUTDAY	Date of the output: day of the year (1...366, 3-digit)
OUTDAYC	Date of the output: name of the day (10-digit) You can use AMO TEXT to set up text strings for this element, which can have the following values: Monday Tuesday Wednesday Thursday Friday Saturday Sunday See also Example 2: before the start of the table.
OUTDAYN	Date of the output: day (2-digit)
OUTHOUR	Date of the output: hour (2-digit)
OUTMIN	Date of the output: minute (2-digit)
OUTMONN	Date of the output: month (2-digit)

Name	Description
OUTMONC	Date of the output: name of the month (10-digit) You can use AMO TEXT to set up text strings for this element, which can have the following values: January February March April May June July August September October November December
OUTSEC	Date of the output: second (2-digit)
OUTYEAR	Date of the output: year (4-digit)
CHRGEE	Paying party: connection's party responsible for connection costs (22-digit) (see In the fields for incoming calls are:). Information on the right or left justified output field Section 59.5.2, "CALLEPTY".
PPLV0	Node number of the paying party, (3-digit)
PPLV1	Subdomain number of the paying party, (3-digit)
PPLV2	Domain number of the paying party, (2-digit)
PRECLEV	Precedence level of the calling party, (2-digit)
QUEUEDUR	Queuing duration: total delay time in the queue in 1/10 seconds (5-digit).
RECNO	Consecutive number of the record to be output (1...9999, 4-digit) by selection group. The consecutive number is initialized to 1 for each dialog field for "Data transmission on demand" or for "Restart" (also for "RELOAD" or "Power on") and is continually incremented for "immediate output" (even after soft restart).

Name	Description
RECPT	Record point (max. 1 digit) Possible values: 0 = transit 1 = exit to trunk 2 = record directly at origin 3 = record directly at origin and exit to trunk 4 = incoming
RECTYPE	Type of recording, either relating to the accounting of call charges or traffic measurement or both (1-digit)
RING10	1/10 seconds part of the ring duration in the format minutes:seconds;1/10 seconds (1-digit)
RINGDUR	Total ring duration in format 1/10 seconds (5-digit) (see In the fields for internal calls are:)
RINGMIN	Minute portion of the ring duration in format minutes:seconds;1/10 seconds (2-digit)
RINGSEC	Second portion of the ring duration in the format minutes:seconds:1/10 seconds (2-digit)
ROUTCC	Trunk group code as text string (10-digit), (see In the fields for incoming calls are: and In the fields for internal calls are:) You can use AMO TEXT to set up text strings for the different trunk group codes, for example, "BUSINESS ", "PRIVATE " (each 10 characters long).
ROUTCN	Trunk group code (6-digit), (see In the fields for incoming calls are: and In the fields for internal calls are:) Instead of the actual trunk group code that is used for seizing the trunk or tie trunk when setting up the connect (for external calls, the prefix "0"), the customer can specify 2-digit numbers (see AMO RNKR). For example, this allows you to use different codes to distinguish between external calls for business or private purposes so that they can be billed separately.
RTINGLV0	Node number of the redirecting party, (3-digit)
RTINGLV1	Subdomain number of the redirecting party, (3-digit)
RTINGLV2	Domain number of the redirecting party, (2-digit)
RTINGPTY	Redirecting party: party that forwards a call (22-digit).
RTIONLV0	Node number of the redirection party, (3-digit)
RTIONLV1	Subdomain number of the redirection party, (3-digit)
RTIONLV2	Domain number of the redirection party, (2-digit)
RTIONPTY	Redirection party: where a call is redirected to (22-digit).

Name	Description
RURAL	Flag for pay phone call, (1-digit) Possible values: 0 = pay phone 1 = other telephone
SELGRUNO	Number of the selection group that created the CDR record (1-digit). You can use AMO SELG (selection group administration) to put the selection group together with different criteria For example, the criteria could be: the connection type (local and long-distance), the entry of a user in a user list, or exceeding a limiting value for the time or cost. By indicating the selection group number, all connections that meet all set criteria of the chosen selection group are recorded.
SERVICE	Output of the service as a text string (10-digit) You can use AMO TEXT to set up text strings for this element, which can have the following values: Voice connection (VOICE) Facsimile (FAX) Data terminal (DTE)
SIDANI	Text string referring to the calling party. The BREAKIN trunk provides the SIDANI number, which refers to the calling party (24-digit)
SIGDATA	Code indicating whether the output data record is correct, incorrect, or a duplicate (10-digit). You can use AMO TEXT to set up text strings for this element, which can have the following values: imprecise or duplicated data record correct data record A data record is identified as imprecise if discrepancies are found while processing the call detail data. For example, this could happen if the connection was automatically restored after a OpenScape 4000 soft restart and the number of call charge pulses and the call duration can not be exactly determined.

Name	Description
SPEED	Output of the transmission speed as a text string (10-digit) You can use AMO TEXT to set up text strings for this element, which can have the following values: No speed information 2400 baud 4800 baud 9600 baud 48000 baud (only for S0 link) 64000 baud (only for S0 link) See the table Meaning of the Values for the Element SPEED in AMO FTBL.
ST10	Connection start: 1/10 second (1-digit)
STDAY	Connection start: day (2-digit)
STHOUR	Connection start: hour (2-digit)
STMIN	Connection start: minute (2-digit)
STMONTH	Connection start: month (2-digit)
STSEC	Connection start: second (2-digit)
STYDAY	Connection start: day of the year (1...366, 3-digit)
STYEAR	Connection start: year (4-digit)
STNID	Output of the station identification as text string (10-digit), (see Note 1) You can use AMO TEXT to set up text strings for this element, which can have the following values: Attendant console Main PBX tie trunk Night server Station Service module (TCS) Special call charge accounting Maintenance equipment Public telephone Mobile user External trunk number (keyset)

Name	Description
SUPLSERV	Output of the supplement service as a text string (10-digit) You can use AMO TEXT to set up text strings for this element, which can have the following values: Not defined Normal call Consultation call Call transfer Callback Forwarding on busy station Call forwarding Call forwarding, no answer Call pick-up Conference call Override Hunt group Mailbox Radio paging (scroll) Dictation Credit card charge Acceptance of reverse charges Call redirection Door opener Ringing state Hang up on hold Hang up on hold in the attendant queue Busy Removal from the attendant queue Entry into the attendant queue Transfer of a conference by the master Automatic recall when transferring Interruption by the attendant Call forwarding to central attendant console No CDR with eos CDR lost buffer Attendant (ATND) activating night service Attendant (ATND) deactivating night service Attendant (ATND) pulls out the plug (log off) Attendant (ATND) inserts plug (log on) Attendant (ATND) deactivated Attendant (ATND) restart Hang up on hold in the hunt group queue
	- Hunt group busy - Data record with SWU and ADP load - Passing the call through (transit) - Call rerouting - Incoming call barred - Destination station deactivated - Resource unavailable - Call rejected - Non-allocated number - Account code - The chargeable convener is integrated in the conference - The chargeable convener has left the conference - A-station on hold - B-station on hold - A-station back from hold - B-station back from hold - A-station cradled on hold - B-station cradled on hold - Ringing after connected
SVCDOM	Service Domain of the calling party, (19-digit),

Name	Description
SWP	Partial switching procedures (10-digit) You can use AMO TEXT to set up text strings for this element, which can have the following values: - No switching procedure (EMPTY) - Section after section (SECASEC) - Section after account code (SECACC) - Section after seizure (SECS) - Section after limit value (SECL) - End of call after section (ENDSEC) - End of call after seizure (ENDS) - End of call after limiting value (ENDL) - Limit after section (LASEC) - Limit after seizure (LAS) - Limit after first limit (LAL) Explanation: The values two to ten arise as possible combinations of the events at the beginning and end of the time frame to which the CDR record refers. The following events are considered: Seizure of a line Beginning a data record Section, change of the party responsible for connection costs (for example, transferring the connection) Closing up the old data record and starting a new one Limiting value exceeded for call charge pulses or time Closing up the old data record and starting a new one End-of-connection Closing up the data record The last of the values given above identifies a section for chained fax messages.
SWULOAD	SWU processor load in 1/10 percent. This is an average value over 10 seconds (4-digit). The time stamp indicating when the load was measured is in the field "Start of the connection"->STDAY(2-digit), STMONTH(2-digit), STHOUR(2-digit), STMIN(2-digit), STSEC(2-digit),ST10(1-digit)
TERMIPA	Terminating IP Address of the call (15-digit)
THRELV0	Node number of the global thread ID (3-digit), identical to GLOBLV0
THRELV1	Subdomain number of the global thread ID (3-digit), identical to GLOBLV1
THRELV2	Domain number of the global thread ID (2-digit), identical to GLOBLV2
THRESEQ	Sequence number of the global thread ID (8-digit), identical to GLOBSEQ
TKNOBCHA	B channel of the real trunk number of the recording point.
TKNOTRGR	Trunk number group of TKNOREAL (real trunk number of the recording point). If the recording point is a telephone, 0 (zero) is output instead of a trunk (2-digit)

Name	Description
TKNOLIST	Fictitious circuit number, converted from TKNOREAL (Trunk no. list, 6-digit) The real circuit number (board number) is depicted on a fictitious circuit number specifically for this customer with the help of a table. You can customize this table with AMO FBTN (administration of the flat byte and trunk number table).
TKNOREAL	Real trunk number of the recording point (trunk no. real, 5-digit): Outgoing connection: outgoing circuit Incoming connection: incoming circuit Internal connection: same private automatic branch exchange: A-station PEN Internal connection: network-wide: outgoing circuit
TRNSFLV0	Node number of transferring party, (3-digit)
TRNSFLV1	Subdomain number of the transferring party, (3-digit)
TRNSFLV2	Domain number of the transferring party, (2-digit)
TRNSFPTY	Transferring party: party that transfers a call (22-digit). Information on the right or left justified output field (see Section 59.5.2, "CALLEPTY").
TRANSCNT	Number of transit nodes passed through (2-digit max.)
UNANS	through connect/ no through connect (10-digit) You can use AMO TEXT to set up text strings for this element, which can have the following values: Through connection (THRCONN) Non-through connection (NTHRCONN)
UNITERAS	Output whether CDRS call charge totals are deleted after being output as text string, only CDRS functionality (22-digit). You can use AMO TEXT to set up text strings for this element, which can have the following values: Difference counter deleted or through-connected Difference counter not deleted or not through-connected
PIN	Personal ID (max. 12-digits)

Name	Description
ZONE	Output of the distance zone as a text string (10-digit, see In the fields for incoming calls are: and In the fields for internal calls are:) You can use AMO TEXT to set up text strings for this element, which can have the following values: 1st incoming zone (INC01) n-th incoming zone (INCnn) 9th incoming zone (INC09) 1st abroad (ABROAD01) n-th abroad (ABROADnn) 99th abroad (ABROAD99) 1st distance (LONG01) n-th distance (LONGnn) 50th distance (LONG50) No charge (NOCHRG) Call detail information from carrier (CHRGINFO) 1st internal zone (INT01) n-th internal zone (INTnn) 9th internal zone (INT09) Empty entry (EMPTY) Short zone (SHORT) Local Zone (LOCAL) 1st zone for tie trunks (TIE01) n-th zone for tie trunks (TIEnn) 9th zone for tie trunks (TIE09)

Remarks:

1) In the fields for incoming calls are:

ATNDGRNO	=	Group number of the attendant console that answered and forwarded this call
CARRIER	=	a carrier that can be allocated to an incoming trunk group (AMO TACSU / TDCSU)
CHOFCON	=	always "LONG"
CONNTYPE	=	"INCOMING"
ROUTCC	=	empty (fill character)
ROUTCN	=	empty (fill character)
STNID	=	station identification of the called station
ZONE	=	a zone INC01 - INC09 that can be allocated to an incoming trunk group (AMO TACSU / TDCSU)

1) In the fields for internal calls are:

CARRIER	=	always "0"
CHRGUNIT	=	empty (fill character)
CONNTYPE	=	"INTERN"
CHOFCON	=	always "LOCAL"
ROUTCN	=	empty (fill character)
ROUTCC	=	empty (fill character)
RINGDUR	=	"0" for ZAND parameter CDRRINGB = NO (AMO ZAND)

ZONE	=	zone INT01 - INT09 determined from the ITR group (AMO VBZGR)

6.3 Call Detail Information for Heterogeneous Networks

6.3.1 Call Charge Display Parameters in AMO COT and AMO COSSU

You can activate and deactivate the Advice of Charge (AOC) messages sent over the tie trunk with the CDRSTN/CDRD parameter in the AMOs COS and COT.

- If the CDRD parameter is set in the tie trunk's AMO COT, the system checks if the CDRSTN parameter is also set in the tie trunk's AMO COS.
- If the CDRD/CDRSTN parameter is set in the tie trunk's AMOs COT and COS, AOC messages are sent over the tie trunk.
- If the CDRD parameter is set in AMO COT but CDRSTN is not set in the AMO COS, no AOC messages are sent over the tie trunk, even if the call charge display class of service is set in the AMO COS for the terminal device.
- If the CDRD parameter is not set in the tie trunk's AMO COT, the CDRSTN parameter in the tie trunk's AMO COS is not checked. AOC messages are only sent over the tie trunk for terminal devices that have the CDRSTN parameter set in the AMO COS.
- If the CDRD parameter is set in the tie trunk's AMO COT, the tie trunk's AMO COS is checked to see if the CDRSTN parameter is also set there.

Table 46: CDRD/CDRSTN in AMOs COT and COSSU

CDRD in AMO COT	CDRSTN in AMO COSSU	
No	Not relevant	The CDRSTN parameter in the tie trunk's AMO COS is not checked. AOC messages are only sent over the tie trunk for terminal devices that have the CDRSTN parameter set in their COS.
Yes	No	Do not send any AOC messages over the tie trunk, even if the CDRSTN parameter is set in the AMO COS for the terminal device.
Yes	Yes	Send AOC messages over the tie trunk.

6.3.2 Charge-Related COT Parameters

6.3.2.1 AOCC

The **AOCC** parameter must always be set for CORNET-NQ tie trunks. Otherwise no Advice of Charge (AOC) messages are sent over the tie trunk.

The COT parameter **AOCC** must also be set for QSIG and ETSI connections to external systems, **but only if the trunk also understands the Advice of Charge request. Clarify this beforehand with the external manufacturer.**

If the COT parameter **AOCC** is set but the trunk does not understand the AOC request, the AOC class of service is suppressed. All AOC messages that are received will be discarded.

More information you can find in section "INCDR - Feature Usage Examples and COT Parameters, Chapter 262, "AOCC - Request charges per line for remote station".

6.3.2.2 IICB

If the parameter IICB is set, billing elements that are received are discarded.

More information you can find in section "INCDR - Feature Usage Examples and COT Parameters, Chapter 272, "IICB - Ignore incoming billing information element".

6.3.2.3 SNBE

If the parameter SNBE is set, no billing elements are sent.

More information you can find in section "INCDR - Feature Usage Examples and COT Parameters, Chapter 276, "SNBE - Send no billing element to the partner system".

6.3.2.4 IGID

If the parameter IGID is set, incoming call IDs are discarded. This is optional and should be used in carrier networks.

Note: This is a mandatory parameter **for carriers.**

6.3.2.5 TRSC

The line sends charge amounts to the originating node (valid for INCDR). If the parameter TRSC is not set, units are reported to the originating node.

More information you can find in section "INCDR - Feature Usage Examples and COT Parameters, Chapter 277, "TRSC - Trunk sends call charges to source node".

6.3.2.6 DPRE

If the parameter DPRE is set, the dialing information that was actually transmitted (including, for example, prefix digits, AMO LODR, OUTPULSE) is passed along to the call detail recording function.

More information you can find in section "INCDR - Feature Usage Examples and COT Parameters, Chapter 268, "DPRE - Send dial information actually sent to partner system as destination number with prefix digits to call data recording".

6.3.2.7 ICZO and ICZL

You can use the parameter ICZO to activate incoming call detail recording per trunk.

You can use the parameter ICZL to activate incoming call detail recording by zone and line.

The parameters ICZL and ICZO are mutually exclusive.

When transferring the connection of a call from the ATND to the station and from the secretary to the executive station, a separate CDR record is created for each call section.

IMPORTANT: The AMO GEFE indicates whether the ATND or the secretary must pay for their call section themselves. The GEFE parameter ATTNDINC defines whether the ATND or the secretary is chargeable for incoming connections. The GEFE parameter ATTNDOUT defines whether the ATND or the secretary is chargeable for outgoing connections.

More information you can find in section "INCDR - Feature Usage Examples and COT Parameters, Chapter 271, "ICZO - Incoming call data recording by zone only" and Chapter 270, "ICZL - Incoming call data recording by zone or from line".

6.3.2.8 CCTN

The parameter CCTN in the AMO COT of an analog circuit causes the telephone number that is entered as the calling party in the circuit number field (CCT) to be reported to the call detail recording function.

More information you can find in section "INCDR - Feature Usage Examples and COT Parameters, Chapter 264, "CCTN - Apply trunk number as A number".

6.3.2.9 DFNN and LWNC on Tie Trunks to an Expression 450

Neither the COT parameter DFNN nor LWNC may be set for the circuit to the XPR because otherwise the paying party would be provided with the wrong account number (with the number of the tie trunk to the XPR).

A dialing analysis is made in the OpenScape 4000 with the calling party that the OpenScape 4000 receives from the XPR. Then the node number from the

RICHT entry is established and, along with the calling party, is reported to the call detail recording function. In this way, the paying party (the calling party) is clearly identified.

More information you can find in section "INCDR - Feature Usage Examples and COT Parameters, Chapter 273, "LWNC - Line protocol without node number" and Chapter 267, "DFNN - Use default node number for trunk as a dummy source node number".

6.3.3 Charge-Related TDCSU Parameters

6.3.3.1 ZONE

The parameter ZONE is read out of the AMO VBZGR branch CHRGINC. The ITR group of the incoming circuit determines the zone, depending on the ITR group of the destination.

The ZONE parameter includes the distance zone for charges based on time.

For the purpose of calculating costs for incoming connections, the line circuits can be allocated cost parameters that are made up of CARRIER and ZONE. You must use AMO TTBL to parameterize CARRIER and ZONE, which always work in combination. The empty zone, for which no charges are incurred according to time, is assigned by default.

6.3.4 Charge-Related FEASU Parameters

6.3.4.1 DISCHNW and CDROGNW

The AMO FEASU also automatically sets the parameter CDROGNW when the parameter DISCHNW is set.

6.3.5 Charge-Related LDAT Parameters

6.3.5.1 LATTR Parameter NOCHDISP

Setting the LATTR parameter NOCHDISP causes the charge display for the terminal device to be suppressed.

However, this does not cause the connection to be marked as expensive in the CDR record EXPENS field of AMO FTBL.

A connection is recorded in the CDR record in the EXPENS field only if it is identified as expensive by the parameter LSCHED in AMO LDAT.

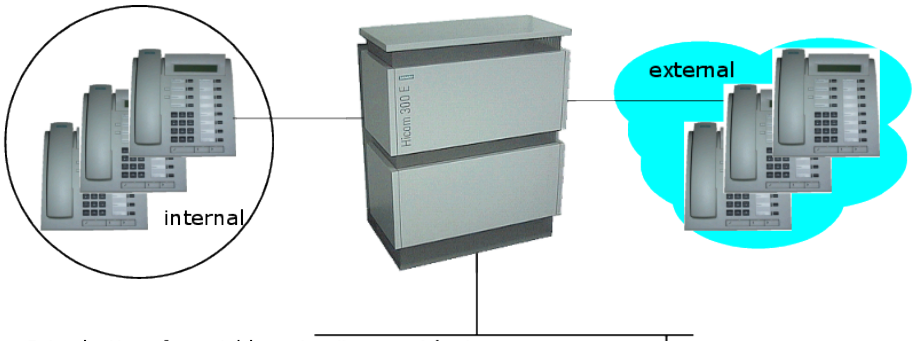
7 Internal and network-wide call detail recording (INCDR) - Usage Examples

7.1 CDRe - Call Detail Recording enhanced

7.1.1 Specification

The "CDRe" feature broadens the scope of call data recording and generates not only call detail records but also, and more importantly, call data records. These call data records are transferred for further processing.

The goal of this feature is to cover as many CDRe changes as possible on the basis of the extended variety of requirements in OpenScape 4000. Because of their complexity, however, CDRe Traffic, CDR Account Code, and Elapsed Time Display are handled separately.



- Introduction of a variable cost unit concept (not for internal connections)
- Introduction of fields in the CDR record for call detail recording
- Recording of all activities at the terminal using CDRe
- Call tracing by implementation of the call sequence number
- Without CDRe call charge recording remains basically unchanged

The data evaluation for call traffic measurement and call data recording is performed on an external processor.

7.1.2 Description

Originally, CDR (Call Detail Recording) was used to assign call charges to a station. For this purpose, various call details are output in a flexible format. These CDR records can then be transferred for further processing.

This principle had been enhanced. Call charge recording is enhanced by the feature "CDRe". This means, that not just call charges are recorded but also all call details. These records are then transferred for further processing. They are also used to measure the effectiveness of call handling and performance They are also used to measure the effectiveness of call handling and performance.

For a Call Management System (CMS) to be able to generate useful information, each destination change must generate a separate call data record. CDRe can be deactivated if these records are not required.

To facilitate the evaluation of the call data records with regard to effectiveness and performance, additional information fields are recorded in the OpenScape 4000; these are available for output in the data record.

In addition to the various numbers associated with the connection, the time a connection waits in the queue is now recorded for attendant consoles.

7.1.3 Modified Cost Unit Assignment Concept

Cost unit assignment can be administered for a connection.

In addition to the internal rules, situations can now be defined where a different cost unit is assigned to a connection which deviates from the internal rules. The user-defined rules override the internal rules. If in a call-processing situation both the internal and the user-defined rules could be applied, the cost unit is assigned according to the user-defined rule. This also allows the complete re-definition of internal rules.

The internal rules can also be displayed to make the entire set of rules easier to understand.

7.1.4 Special Features

- Data is always entered in the Paying_Party, Calling_Party, and Destination_Party fields in the charge detail record. In contrast, the Called_Party field is not always supplied with data. Data is entered in the Transferring-Party field in the event of call transfer. The Mobile_User_Calling and Key_Line_Used CM (PIN /KEY system) fields are feature-dependent.
- If CDRE is active, the entries for cost distribution on the AC and for CHESEs in the AMO GEFE are ignored. A separate CDB is generated for each call segment.
- When CDRE is active, the off-hook signal starts the call detail recording irrespective of the entry in ZAND (answer or end of dial).
- The AMO DEFPP is only applicable to an incoming and outgoing connection. The entries are ignored for an internal connection.
- A customer-specific calling number should be entered for each trunk or attendant in the AMO TLZO. If you do not enter this number, a default calling number (999999) is entered in the record.
- In the AMO KNMAT, MODCON parameter entries are ignored for the virtual node number CDR.

- The COT parameter AOCC:
  - should always be set in systems with V2.0 or later with Cornet NQ, ECMA, and QSIG.
  - in external systems with ECMA/QSIG should be checked to ensure that the parameter is interpreted correctly in the remote system. Display information is lost in the event of incorrect interpretation.
  - should be set if you want charge information to be sent to the connected system.
  - must not be set for other protocols, such as, DSS1, DPNSS, and DASS because the remote system cannot work with the protocol messages that this would generate, which could result in the OpenScape 4000 incorrectly turning off the display information.
- The COT parameter ICZO only activates the incoming call detail recording on the trunk.
- The ICZL has no function at this time because no carrier currently sends charge information for incoming calls.
- In the AMO PERSI, COPIN specifies which calling number is sent to the call detail recording module during identification (station or mobile).

7.1.5 User Interface

Most changes to the user interface result from the consolidation of the US call detail recording and IM CDRe.

7.1.6 Service Information

No special requirements.

7.1.7 AMOs

7.1.7.1 Enabling and Disabling Call Data Recording Enhancements

- CDR-e is enabled as follows:
  `CHANGE-FEASU:TYPE=A,CM=CDRE;`
- CDR-e is disabled as follows:
  `CHANGE-FEASU:TYPE=D,CM=CDRE;`

7.1.7.2 Important Fields in the Call Detail Record

- Output the connection's cost unit with node and number:

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="COST UNIT: #@-#@-#@@@ #@@@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;
```

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=PPLV0,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=2,
FLDNAME=PPLV1,FILLTYPE=CHAR,FILLER=" ",
FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=3,
FLDNAME=PPLV2,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=4,
FLDNAME=CHRGEE,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the calling party with node and number

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="CALLER: #@-#@-#@@@ #@@@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=CALLILV0,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=2,
FLDNAME=CALLILV1,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=3,
FLDNAME=CALLILV2,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=4,
FLDNAME=CALLIPTY,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the dialed number and length of the number

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="DIALED: #@@@@@@@@  NO. LENGTH: #@@";
```

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=CALLEPTY,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=2,
FLDNAME=LCALLENO,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=R;
```

- Output the connection's current destination with node and number and its length:

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,
END=N,FORMAT="DESTINATION: #@-#@-#@@@ #@@@@@@@@
NO. LENGTH: #@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=DESTLV0,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=2,
FLDNAME=DESTLV1,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=3,
FLDNAME=DESTLV2,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=4,
FLDNAME=DESTPTY,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=5,
FLDNAME=LDESTNO,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=R;
```

- Output the forwarding party of a forwarded connection with node and number:

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="FORWARDER: #@-#@-#@@@#@@@@@@@@@";
```

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=RTINGLV0,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=2,
FLDNAME=RTINGLV1,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=3,
FLDNAME=RTINGLV2,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=4,
FLDNAME=RTINGPTY,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the forwarding destination of a forwarded connection with node and number:

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="FORWARDING DESTINATION: #@-#@-#@@@ #@@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=RTIONLV0,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=2,
FLDNAME=RTIONLV1,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=3,
FLDNAME=RTIONLV2,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=4,
FLDNAME=RTIONPTY,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the connected user of a transferred connection with node and number:

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="TRANSFERRING PARTY: #@-#@-#@@@ #@@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=TRNSFLV0,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=2,
FLDNAME=TRNSFLV1,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=3,
FLDNAME=TRNSFLV2,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=4,
FLDNAME=TRNSFPTY,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output a home station of a number identified with a PIN, with node and number

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="TRANSFERRED: #@-#@-#@@@ #@@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=MOBUCLV0,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=2,
FLDNAME=MOBUCLV1,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=3,
FLDNAME=MOBUCLV2,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=4,
FLDNAME=MOBUCPTY,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the number assigned to the keyline used, with node and number

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="KEYLINE: #@-#@-#@@@ #@@@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=KEYLV0,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=2,
FLDNAME=KEYLV1,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=3,
FLDNAME=KEYLV2,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=4,
FLDNAME=KEYPTY,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the call ID and the number of the CDB record:

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="CALL ID: #@-#@-#@@@/#@@@@@@@@@, #@-#@-#@@@/
#@@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=2,END=N,
FORMAT="COUNTER: #@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=6,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=GLOBLV0,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=2,FLDNAME=GLOBLV1,
FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

```
ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=3,FLDNAME=GLOBLV2,
FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=4,FLDNAME=GLOBSEQ,
FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=5,FLDNAME=LEGLV0,
FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=6,FLDNAME=LEGLV1,
FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=7,FLDNAME=LEGLV2,
FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=8,FLDNAME=LEGSEQ,
FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=9,FLDNAME=CONNSTEP,
FILLTYPE=CHAR,FILLER=" ",FLDALIGN=R;
```

- Output the wait time (1/10 seconds) in an AC's queue:

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="WAIT TIME: #@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=QUEUEDUR,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=R;
```

- Output the account code (ACCTCODE):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="ACCTCODE: #@@@@@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
```

```
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=ACCTCODE,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the ADP processor load (ADPLOAD):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="ADP-TIME: #@:#@,#@'#@ #@-#@-#@@@
ADP-LOAD: #@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=ENDHOUR,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=2,
FLDNAME=ENDMIN,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=3,
FLDNAME=ENDSEC,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=4,
FLDNAME=END10,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=ENDDAY,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=2,
FLDNAME=ENDMONTH,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=3,
FLDNAME=ENDYEAR,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=4,
FLDNAME=ADPLOAD,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the SWU processor load (SWULOAD):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
```

```
FORMAT="SWU-TIME: #@:#@,#@'#@ #@-#@-#@@@   SWU-LOAD:
 #@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=STHOUR,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=2,
FLDNAME=STMIN,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=3,
FLDNAME=STSEC,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=4,
FLDNAME=ST10,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=STDAY,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=2,
FLDNAME=STMONTH,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=3,
FLDNAME=STYEAR,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=4,
FLDNAME=SWULOAD,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the calling party ID (CALLIID):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="CALLIID: #@@@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
```

```
FLDNAME=CALLIID,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the destination party ID (DESTPID):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,
END=N,FORMAT="DEST-ID: #@@@@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=DESTPID,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the connection type (CONNTYPE):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,
END=N,FORMAT="CONNTYPE: #@@@@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=CONNTYPE,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the text string relating to the dialed number (DNIS):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,
END=N,FORMAT="DNIS: #@@@@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;
```

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=DNIS,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the text string relating to the calling number (SIDANI):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="SIDANI: #@@@@@@@@@@@@@@@@@@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=SIDANI,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the values for FX trunk access on the A side (FACA):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,
END=N ,FORMAT="FACA: #@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=FACA,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the values for FX trunk access on the B side (FACB):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="FACB: #@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;
```

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=FACB,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the global leg ID node number (GLOBLLV0):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="GLOBAL LV0: #@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=GLOBLLV0,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the global leg ID subdomain number (GLOBLLV1):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="GLOBAL LV1: #@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=GLOBLLV1,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the global leg ID domain number (GLOBLLV2):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="GLOBAL LV2: #@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
```

```
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=GLOBLLV2,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the global leg ID sequence number (GLOBLSEQ):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,
END=N,FORMAT="GLOB SEQ: #@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=GLOBLSEQ,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the global thread ID node number (THRELV0):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="THREAD LV0: #@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=THRELV0,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the global thread ID subdomain number (THRELV1):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="THREAD LV1: #@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;
```

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=THRELV1,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the global thread ID domain number (THRELV2):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="THREAD LV2: #@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=THRELV2,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the global thread ID sequence number (THRESEQ):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="THREAD SEQ: #@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=THRESEQ,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the entire hold duration (HOLDDUR):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="HOLDDUR: #@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;
```

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=HOLDDUR,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the trunk number group of the non-recording point (INTNTRGR):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="PTRK-GRP: #@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=INTNTRGR,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the trunk number group of the recording point (TKNOTRGR):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="TRK-GRP: #@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=TKNOTRGR,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output network call transfer (NCT):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="NCT: #";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
```

```
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=NCT,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the A party network carrier (NETCARA):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="NETCARA: #@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=NETCARA,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the B party network carrier (NETCARB):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="NETCARB: #@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=NETCARB,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the A party network service (NETSVCA):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="NETSVCA: #@";
```

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=NETSVCA,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the B party network service (NETSVCB):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="NETSVCB: #@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=NETSVCB,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output operator system access A (OSAA):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="OSAA: #";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=OSAA,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output operator system access B (OSAB):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="OSAB: #";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=OSAB,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Output the record type (RECTYPE):

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,
END=NFORMAT="RECTYPE: #@@@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=RECTYPE,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

- Filters in the AMO SELG

  RECTYPE indicates relevance for PM and/or CDRE.

  CONNTYP can be used to filter according to ACACT/LOAD/ALL, depending on the requirements.

  SERVICE now only supports VOICE, FAX, and DTE.
- Conversion of numerical values into texts with the AMO TEXT

  SERVICE, SWP, CONNTYP, and SUPLSERV have been changed.

7.1.7.3 Modified Cost Unit Assignment Concept

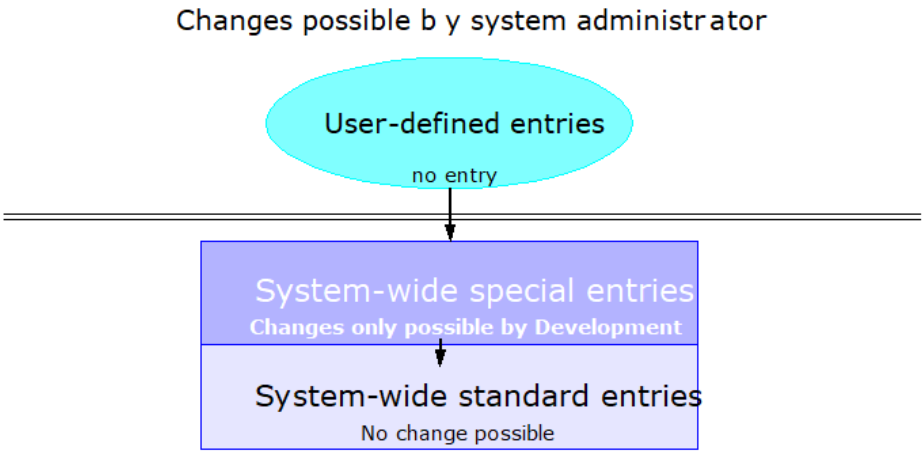
Standard behavior, that is, the system should behave as usual with regard to cost unit assignment:

Normal system behavior. No configuration data is necessary.

Reset all entries and restore the standard behavior with regard to cost unit assignment:

```
DELETE-DEFPP:ALL;
```

7.1.7.4 Processing Sequence for Entries in DEFPP



Configuring special rules for callback

If a callback is entered in the requested called party's mailbox and the mailbox owner activates the callback, the charges are normally assigned to the mailbox owner as the cost unit. For connections over tie trunks, the originator of the connection can be defined as the cost unit:

```
ADD-DEFPP:CONNTYPE=OUTGO,SUPLSERV=CALLBACK,
CHRGEE1=CONNECT;
```

NOTICE: Attention! For normal callback connections over tie trunks without a mailbox, cost unit assignment is reversed with the result that the called party becomes the cost unit.

Configuring special rules for conditional and unconditional call forwarding

If the central office forwards a call several times, the charges are normally assigned to the original called party who initiated the first call forwarding action. In the case of connections that are forwarded several times and then finally to the central office, the charges are assigned to the station that initiated forwarding to central office. The following settings are necessary either if the charges for connections from the central office are to be assigned to the actual party reached or if the charges for connections to the central office are to be assigned to the initiator of the connection:

```
ADD-DEFPP:CONNTYPE=OUTGO,SUPLSERV=CALLFOR,
CHRGEE1=CALLING;

ADD-DEFPP:CONNTYPE=INCO,SUPLSERV=CALLFOR,
CHRGEE1=CONNECT;
```

Configuring special rules for a hunt group

A hunting group is normally reached via the hunting group station number. The charges are assigned to the hunting group member who answers the call. The following setting is necessary, if the charges are to be assigned to the hunting group station number:

```
ADD-DEFPP:CONNTYPE=INCO,SUPLSERV=HUNTGRP,
CHRGEE1=CALLED;
```

Configuring special rules for override

An override connection is always an internal connection. Administration of charge assignment is not possible for internal connections.

Configuring special rules for call pickup

Normally, the charges are assigned to the station that picks up a trunk call. It is, however, possible to define the originally called party as the cost unit:

```
ADD-DEFPP:CONNTYPE=INCO,SUPLSERV=PICKUP,
CHRGEE1=CALLED;
```

Configuring special rules for call transfer

Normally, the charges accrued during call transfer are assigned to the internal station (or the held party, if all stations are internal). The following settings are necessary if the charges for an extended connection are to be assigned to the extending party:

```
ADD-DEFPP:CONNTYPE=OUTGO,SUPLSERV=TRANSFER,
CHRGEE1=TRANSPTY;

ADD-DEFPP:CONNTYPE=INCO,SUPLSERV=TRANSFER,
CHRGEE1=TRANSPTY;
```

7.1.7.5 Changes in the AMO GEFE

This is where you specify whether the attendant or secretary are assigned their own charges or if the charges are passed on to the other party. This can be set independently for incoming and outgoing connections.

COSTDUTY OF ATTENDANT / SECRETARY	INCOMING :	NO
	OUTCOMING :	NO

If two outgoing calls are connected to each other, this parameter allows or blocks a possible change to the connection direction of one of these two calls (in this case, from "outgoing" to "incoming").

CHANGE OF CALL DIRECTION IN TICKET SEQUENZ :	YES

The parameter shows renewed ringing for a call that was already put through. In this case, SupplService is changed to Ring_after_connect.

NEW RINGING, THROUGH CONN. CALL IN RINGDUR :	NO

The parameter allows the queuing duration to be output without enabling the CDRE feature.

OUTPUT OF QUEUE_DUR WITHOUT ACTIVATION OF CDRE :	YES

A user identified as "confidential" is suppressed in the CALLIPTY output field (AMO FTBL). This user is usually also the paying party (as Calling). This parameter can be used to allow or block the output of this confidential user in the PayingParty field.

SHOW RESTRICTED SUBSCRIBER IN PAYINGPARTY :	NO

You can also specify whether the destination number should be shortened by two digits.

DESTINATION NUMBER SHORTENED BY 2 DIGITS :	NO

Should a new ticket and therefore a new call detail record be generated if the other party involved in the call with the paying party (PP) changes because of forwarding or similar.

TICKET BY SAME PP :	YES

Call charge units received by the carrier are entered in the field Field CHUNIT. If YES is set, the call charge information from the CO is entered in NETPULS while internally calculated call charge data is entered in CHUNIT.

OFFICIAL UNITS ARE SAVED IN CDB :	YES

With incoming call detail recording, the called party is entered as the paying party. This is not always correct. This parameter changes the calling party into the called party.

INCOMING CALLING IN THE FIELD OF CALLING :	NO

Information for AOCs

```
AOC-S COST CALCULATION CONFIGURATION

   THROUGH CONNECTED

                       BASIC COMM    : YES

                       CALL ATTEMPT  : NO

                       CALL SETUP    : YES

                       UUI           : NO

                                    OP. OF. SS.   : NO
 (Basic charge for special
services)

   NON THROUGH CONNECTED
```

```
                        BASIC COMM    : YES

                        CALL ATTEMPT  : YES

                        CALL SETUP    : NO

                        UUI           : NO

                                    OP. OF. SS.   : NO
 (Basic charge for special
services)
```

- Use KNMAT to make changes

```
 NODE ID HANDLING

                            INTERNAL : NO

                              INCOMING : NO

                              OUTGOING : NO
```

- In an E164 numbering plan, the prefix is added to the station number

```
PREFIX HANDLING OF STATION

                            INTERNAL : NO

                              INCOMING : NO

                              OUTGOING : NO


 CARRIER      TYPE OF         CALL DETAIL REC. AT

METHODS FOR

             CALL DETAIL REC.     CONNECTION END     NORM
 SPEC
PUBL OPER

0               MIX                  NO             0
 0
0    0

1               MIX                  NO             0
 0
0    0

2               MIX                  NO             0
 0
0    0

3               MIX                  NO             0
 0
```

```
0     0

4                 MIX                   NO              0
 0
0     0

5                 MIX                   NO              0
 0
0     0

6                 MIX                   NO              0
 0
0     0

7                 MIX                   NO              0
 0
0     0

8                 MIX                   NO              0
 0
0     0

9                 MIX                   NO              0
 0
0     0
```

7.2 Call Detail Recording enhanced Traffic

7.2.1 Feature Description

The goal of this performance feature is to generate additional CDR records in order to allow a call traffic management application to create certain statistics. These additional records are based on CDRe.

7.2.2 User Interface

Starting and stopping measurement:

The measurement is started/stopped via the AMO DEFTM.

Additional records for the call traffic measurement are only created when the measurement has been started, i.e. when the tag is set. In all other cases, only normal "charging relevant" tickets are created.

Filter function on the basis of the call traffic measurement table:

A list of the objects to be measured can be defined ("ALL" is likewise possible, and results in the entire traffic being recorded).

When call traffic measurement is started, only records with a relationship to objects in the call traffic measurement table are generated. In this check, the

fields for calling party (i.e. FTBL-field CALLIPTY), connected party (or called party if connected party is not available) (DESTPTY field in FTBL), TRUNK number and PARTNER TRUNK number are compared with the entries in the call traffic measurement table. If at least one of these objects exists in the call traffic measurement table, the record is labelled as "relevant for call traffic measurement" (in the "Record Type" field).

A distinction is made between the following cases:

- Normal stations (likewise secretary and executive) are checked against the station list.
- Attendant console and night service are checked against the AC list. Furthermore, the attendant console group is checked against the entries in the attendant console group table.
- Trunk and partner trunk are compared with the trunk object list. Furthermore, the trunk group and partner trunk group are compared with the entries in the trunk group list.
- If a connection to a hunt group is involved, the DESTPTY is also compared with the hunt group object list. Furthermore, the head number is determined and likewise compared.

Record type:

Every ticket contains a field with information on whether this record is relevant for charging and / or for traffic measurement.

SWU / ADP load:

If the SWU / ADP load (average processor load of at least 10 seconds) is to be measured, a load ticket is generated every 10 seconds. In this case, the record type is likewise set to "traffic measurement relevant".

Activities of the attendant console:

If

- the attendant activates / deactivates night service,
- the attendant removes / inserts the jack,
- AC-WIN stops / starts operation - with the following cases covered in this context:
  - the AC-WIN program is started / stopped,
  - the AC-WIN PC is activated / deactivated,
  - the attendant console is blocked / deblocked through an AMO command,

  An activity ticket is generated. In this case, the RECORD TYPE is likewise set to ASC "traffic measurement relevant".

Queuing time for hunting groups:

The time a connection waits - in the queue of a hunting group - is measured.

7.2.3 Service Information

No special requirements. This performance feature must be regarded in connection with the feature CDR enhanced.

A normal record is generated in this context. Most of the non-relevant fields are filled with fillers. The activity of the attendant console can be seen in the SUPPLSERV field and CALLIPTY provides the AC number. The CONNTYPE field contains the label for this function: ACACT

In the RECTYPE field, "2" documents that this record is only relevant for PM.

7.2.4 Generation

Activate performance feature CDRe Traffic (or PM, Performance Management)

```
CHA-DEFTM:PMON=Y;
```

Activate all measuring objects

```
CHA-DEFTM:ALLON=Y;
```

Generate special load tickets

```
CHA-DEFTM:LOADON=Y
```

Activate special activity tickets of the attendant console

```
CHA-DEFTM:ACACTON=Y;
```

Adding the field RECORD TYPE (RECTYPE) in the charge data record output

```
ADD-FTBL:FORMNO=4,TYP=B,TBL=FORM,NO=1,END=N,
FORMAT="RECTYPE:#@@@@@@@@@@";

ADD-FTBL:FORMNO=4,TYP=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYP=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYP=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYP=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=1,
FLDNAME=RECTYPE, FILLTYPE=CHAR,FILLER=" ",
FLDALIGN=L;
```

Adding the field Processor Load ADP (ADPLOAD) in the charge data record output

```
ADD-FTBL:FORMNO=4,TYP=B,TBL=FORM,NO=1,END=N,
FORMAT="ADP-TIME: #@:#@,#@'#@ #@-#@-#@@@

ADP-LOAD: #@@@@"; ADD-FTBL:FORMNO=4,TYP=B,
TBL=CTRL,NO=2,END=N,CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYP=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYP=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;
```

```
ADD-FTBL:FORMNO=4,TYP=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=1,
FLDNAME=ENDHOUR, FILLTYPE=CHAR ,FILLER=" ",
FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=2,
FLDNAME=ENDMIN, FILLTYPE=CHAR ,FILLER=" ",
FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=3,
FLDNAME=ENDSEC, FILLTYPE=CHAR ,FILLER=" ",
FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=4,
FLDNAME=END10, FILLTYPE=CHAR ,FILLER=" ",
FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=1,
FLDNAME=ENDDAY, FILLTYPE=CHAR ,FILLER=" ",
FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=2,
FLDNAME=ENDMONTH, FILLTYPE=CHAR,FILLER=" ",
FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=3,
FLDNAME=ENDYEAR, FILLTYPE=CHAR,FILLER=" ",
FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=4,
FLDNAME=ADPLOAD, FILLTYPE=CHAR ,FILLER=" ",
FLDALIGN=L;
```

Adding the field Processor Load SWU (SWULOAD) in the charge data record output

```
ADD-FTBL:FORMNO=4,TYP=B,TBL=FORM,NO=1,END=N,
FORMAT="SWU-TIME: #@:#@,#@'#@ #@-#@-#@@@
SWU-LOAD: #@@@@";

ADD-FTBL:FORMNO=4,TYP=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYP=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYP=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYP=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=1,
FLDNAME=STHOUR, FILLTYPE=CHAR ,FILLER=" ",
```

```
FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=2,
FLDNAME=STMIN, FILLTYPE=CHAR ,FILLER=" ",
FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=3,
FLDNAME=STSEC, FILLTYPE=CHAR ,FILLER=" ",
FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=4,
FLDNAME=ST10, FILLTYPE=CHAR ,FILLER=" ",
FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=1,
FLDNAME=STDAY, FILLTYPE=CHAR ,FILLER=" ",
FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=2,
FLDNAME=STMONTH, FILLTYPE=CHAR ,FILLTYPE=" ",
FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=3,
FLDNAME=STYEAR, FILLTYPE=CHAR ,FILLER=" ",
FLDALIGN=L;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=4,
FLDNAME=SWULOAD, FILLTYPE=CHAR ,FILLER=" ",
FLDALIGN=L;
```

Adding the field Hold Time(HOLDDUR) in the charge data record output

```
ADD-FTBL:FORMNO=4,TYP=B,TBL=FORM,NO=1,END=N,
FORMAT="HOLDDUR: #@@@";

ADD-FTBL:FORMNO=4,TYP=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYP=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYP=B,TBL=CTRL,NO=4,END=N,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYP=B,TBL=CTRL,NO=5,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYP=B,TBL=FIELD,NOFELD=1,
FLDNAME=HOLDDUR, FILLTYPE=CHAR ,FILLER=" ",
FLDALIGN=L;
```

Filter in AMO SELG

The RECTYPE indicates relevance for PM and / or CDRE.

With CONNTYP, filtering according to ACACT / LOAD / ALL can be performed if required.

Please refer also to the Service Manual and the ID10114 CDRE Adaptions feature description for configuring and activating call charge recording.

7.2.5 Relevant AMOs

- New AMOs

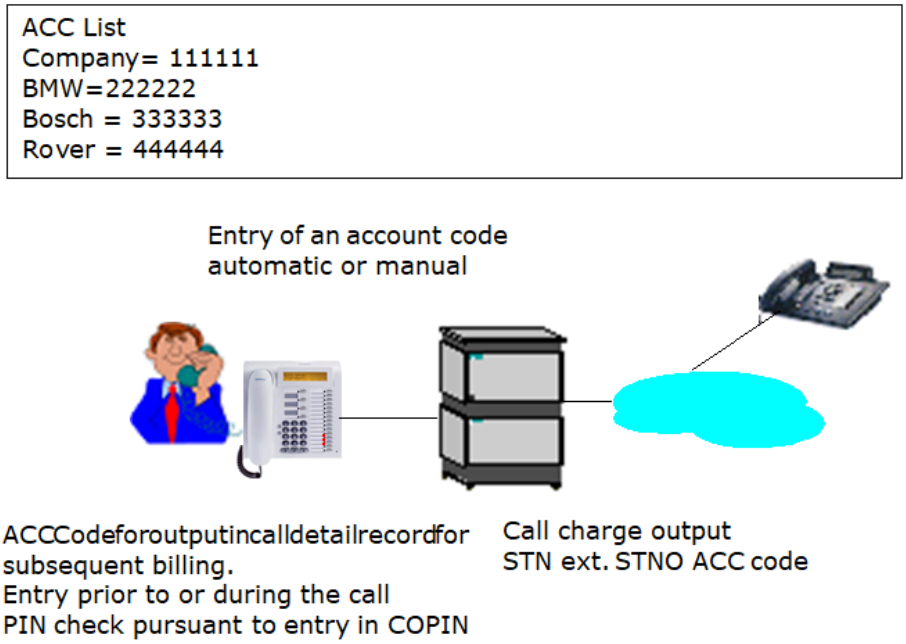
AMO	Parameter	Sprache/ Language	Beschreibung/ Description
DEFTM	ACACTON	D	Erfassen der Ereignisse des Vermittlungsplatzfernsprechers
	ACACTON	E	Monitoring of the events of attendant console
	ALLON	D	Alle Objekte, ausser der Prozessorlast und der Aktivität des Vermittlungsplatzfernsprechers werden erfasst.
	ALLON	E	Monitoring of all objects except processor load and attendant console activity.
	ATNDGRNU	D	Vermittlungsplatzgruppennummer
	ATNDGRNO	E	Attendant group number
	EBT	D	Einbauteilung in der LTU
	CCT	E	Circuit number
	LOADON	D	spezielles PM-Ticket mit der Prozessorlast
	LOADON	E	special PM-Ticket containing processor load
	LTU	D	Leitungsverbindungseinheit
	LTU	E	Line Trunk Unit
	NUMMER	D	Teilnehmernummer
	NUMBER	E	Station number
	OBJECT	D	Messobjekttypen
	OBJECT	E	Measurement object types
	PMON	D	Zentralschalter für das Performance Management
	PMON	E	Central switch for performance measurement
	SATZ	D	Nummer des Baugruppensatzes

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	SLOT	E	Specification of the mounting pitch in the LTU
	TRKGRNU	D	Bündelnummer
	TRKGRNO	E	Trunk group number
FTBL	ELNAM	D	Identification of the variable fields ADPLOAD: Prozessorlast des ADP, HOLDDUR: gesamte Haltezeit, RECTYPE: Art der Aufzeichnung, SWULOAD: Prozessorlast der SWU
	FLDNAME	E	Identification of the variable fields ADPLOAD: processor load of the ADP, HOLDDUR: total hold duration, RECTYPE: for which application areas the record is relevant, SWULOAD: processor load of the SWU,
SELG	RECTYPE	D	Aufz. relevant fuer: CDR/PM/CDR&PM
		E	Record is relevant for: CDR/PM/CDR&PM

- Changed AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
SELG	CONNTYPE	D	Art der Verbindung erweitert
		E	Connection type enhanced
TEXT	SUPLSERV	D	Supplementary services erweitert
		E	Supplementary services enhanced
	SUBSID	D	Teilnehmertyp erweitert
		E	Subscriber ID enhanced
	CONNTYPE	D	Art der Verbindung erweitert
		E	Connection type enhanced

7.3 Call Detail Recording - Account Code



7.3.1 Feature Description

With the "Account Code" feature, incoming and outgoing calls can be provided with an account number or, consecutively, with several account numbers which are displayed in the call charge data output.

7.3.2 User Interface

Two types of account code can be configured in the system:

- automatic account code
- manual account code

The automatic account code is assigned automatically to every station for every outgoing call. It is configured system-wide and can also be changed individually by station.

The user can overwrite an automatic account code with a manual account code per call.

The manual account code can be entered as follows both prior to and during a call:

- with the digit analysis result for account code
- using the service menu
- using the main menu
- using the account code key
- using the ACD transaction code key
- using the ACD transaction code

The following check types can be configured for the manual account code:

- no check
- check of the code length
- modulo check (= configurable algorithm)

7.3.3 Service Information

The account code feature must be released in the system with the AMO FEASU.

The automatic account code can be configured system-wide with the AMO ZAND and also edited individually by station with the AMO SDAT.

For the manual account code, the station requires a COS parameter configured with the AMO COSSU. This authorization only applies to its physical connection and cannot be transferred with the PIN-Mobile User feature.

The access codes for the manual account code and the ACD transaction code are configured with the AMO WABE.

The manual account code and the check type are configured with the AMO PERSI in COPIN 9. The string length of the account code can likewise be administrated in PERSI.

The account code key and the ACD code key are configured with the AMO TAPRO.

In AMO ZAND, it can be specified whether the manual transaction code can also be activated with the code or key for ACD transaction code. The user interface differs when using the ACD function and when entering the account code via CDRACC code or key. In the case of the ACD function, the code entry must always be ended with the '"#' character, for example, and every code entered is accepted without being checked.

7.3.4 Generation (Example)

Account Code Setup - Examples

- Activate account code feature in system:

  ```
  CHA-FEASU:TYPE=A,CM=CDRACC;
  ```
- Add digit analysis result *86 (8086) for account code:

  ```
  ADD-WABE:CD=*86,DPLN=0,DAR=CDRACC,CDDP=8086;
  ```
- Add COS for manual account code:

  ```
  CHA-COSSU:TYPE=COS,COS=23,AVCE=ACTMAN;
  ```
- Add code '4711' for account code:

  ```
  ADD-PERSI:TYPE=CDRAC,CDRAC=4711;
  ```
- Display COPIN 9 settings for the account code:

  ```
  DIS-PERSI:TYPE=COPIN,COPIN=9;
   H500:  AMO PERS STARTED

  +-------
  +-------------------------------------------------+
  ```

```
| COPIN | COPIN PARAMETER
  |

+-------
+-------------------------------------------------+

|  9    | COTYPE   =  PCODE
  |

|       | PINTEXT  = 'ACCOUNT CODE        '
  |

|       | CDRACLEN =  5
  |

|       | CDRTEXTS =  NO
  |

|       | CDRTEXT  = '          '
  |

|       | DISPRSTN =  NO            IDHOME   =  NO
  |

|       | PINTEST  =  LENGTH        DISPID   =
 PERMDISP |

|       | TRKCD    =  0             TRACE    =  NO
  |

|       | TRKCDTYP =  NO            PINEXT   =  YES
      |

|       | PINDUR   =  ONE           DISPPIN  =  YES
      |

|       | TRANSFER =  NO            PINNKEY  =  NO
  |

|       | DEACKEY  =  NO            POSCHKN  =  1
  |

|       | COSHOME  =  NO            PINLCOS2 =  NO
   |

|       | DPTEST   =  NO
   |

+-------
+-------------------------------------------------+

AMO-PERS-111 PERSONAL IDENTIFICATION

DISPLAY COMPLETED;
```

- Add account code key:

```
CHA-TAPRO:STNO=3156,STD=19,DIGTYP=OPTISET,
KY11=CDRACC;
```

- Add ACD transaction code key:

```
CHA-TAPRO:STNO=3156,STD=19,DIGTYP=OPTISET,
KY12=ACC;
```

- Add automatic account code in system:(default account code)
  `CHA-ZAND:TYPE=ACC,DCDRACC=1234;`
- Display of the data configured in the system (automatic account code=1234, activation via ACD function=no) for the account code:
  `DIS-ZAND:TYPE=ACC;`

```
 H500:  AMO ZAND  STARTED

ACCOUNT CODE

====================

DCDRACC = 1234        ,    ACCONEKY = NO;

AMO ZAND -111 CENTRAL SYSTEM DATA

DISPLAY COMPLETED;
```

- Configure account code via ACD Transaction Code:
  `CHA-ZAND:TYPE=ACC,ACCONEKY= YES;`
- Add automatic CDRACC for station 3156:
  `CHA-SDAT:STNO=3156,TYPE=DATA1,CDRACC=6789;`
- Add account code in the call charge data output:

```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END,
FORMAT="ACCTCODE: #@@@@@@@@@@@";

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,
END=N,CTLCHARS=CR;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,
END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=4,
END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=5,
END=J,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=ACCTCODE,FILLTYPE=CHAR,FILLER=" ",
FLDALIGN=L;
```

Please refer to the Service Manual and the CDRE Adaptions feature description for configuring and activating call charge recording.

7.3.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
FEASU	CDRACC	d	Gebuehrenerfassung Account Code Leistungsmerkmal Abrechnungs Code im System einschalten
	CDRACC	e	Call Detail Recording Account Code switch feature Account Code
WABE	CDRACC	d	CDR Account Code Kennzahl für Abrechnungs Code einrichten
	CDRACC	e	CDR Account Code digit analysis result Account Code
COSSU	ACTMAN	d	Manueller CDR Code Moeglich COS für manuellen Abrechnungs Code einrichten
	ACTMAN	e	Allow Manual Cdr Account Code Cos for manuel cdr account code
PERSI	CDRAC	d	CDR Account Code Code für Abrechnungs Code einrichten
	CDRAC	e	Cdr Account Code
	CDRACLAE	d	Länge des CDR account codes
	CDRACLEN	e	Length Of Cdr Account Code
TAPRO	CDRACC	d	CDR Account Code Key Taste für Abrechnungs Code einrichten
	CDRACC	e	CDR Account Code Key
ZAND	ACC	d	Einstellungen Fuer Account Code
	ACC	e	settings for CDR Account Code
	DCDRACC	d	Default CDR Account Code automatischen Abrechnungs Code im System einrichten oder löschen (Eingabe: "F")
	DCDRACC	e	Default CDR Account Code set or delete (input: "F") default CDR Account Code in system

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	ACCMEINT	d	Account Code Mit Einer Taste Aktivieren Nein= Abrechnungs Code ist nicht mittels ACD-Transaktions Code möglich Ja= Abrechnungs Code ist mittels ACD-Transaktions Code möglich
	ACCONEKY	e	Account Code With One Key Only No= CDR key triggers CDR, ACD key triggers ACD-G (DB-Initialization) Yes= ACD triggers ACD-G and CDR
SDAT	CDRACC	d	CDR Account Code automatischen CDRACC für einen Teilnehmer ändern
	CDRACC	e	CDR Account Code automatic CDRACC for subscriber
FTBL	ELNAM	d	Bezeichnung des variablen Feldes ACCTCODE: Account-Code des Rufes
	FLDNAME	e	Identification of the variable fields (new: ACCTCODE: account code of call

7.4 Call Charge Data Display

7.4.1 Call Charge Data Display from the CDRS File

- Create a scheduled job for output once, more than once, or periodically with:

  ```
  ADD-
  GETAB:TYPE=L,DIAFNO=<number>,DEV=<string>,TAR=<string>,
  STAT=<string>,[STADAY2=<string>],[STADAY3=<string>],
  [STAHR2=<number>],[STAHR3=<number>],[PERIOD=<string>],
  STNO=<string>,DEL=<string>;
  ```
- Set up a short dialog to start immediate output for a current station number, a station list ,or a line list with:
  ```
  ADD-GETAB:TYPE=S,DIAFNO=<number>,
  STNO=<string>,DEL=<string>;
  ```
- Immediate output of a dialog field with:
  ```
  OUTPUT-GETAB:DIAFNO=<number>;
  ```
- Cancel the output with:
  ```
  STOP-GETAB:DIAFNO=<number>;
  ```
- Display the dialog fields with:
  ```
  DIS-GETAB:[DIAFNO=<number>];
  ```

- Delete one dialog field with:
  `DEL-GETAB:DIAFNO=<number>;`

7.4.2 Call Charge Data Display on Supplementary Device

- Create a long dialog to delete the data without output with:

  ```
  ADD-GEZAB:TYPE=L,DIAFNO=<number>,FILE=<character>,
  FILESTA=<string>,FILEND=<string>,DEV=NODEV,DEL=<Y\N>,
  FOUT=<Y/N>;
  ```

- Create a scheduled job for output once, more than once, or periodically with:

  ```
  ADD-GEZAB:TYPE=L,DIAFNO=<number>,FILE=<character>,
  FILESTA=<string>,FILEND=<string>,
  DEV=<DEV1\DEV2\DEV3\DEV4\TAPE\FT>,
  DEL=< Y\N>,FORM=<string>,BLKSIZE=<number>,
  FOUT=Y\N>,STAT=<string>,
  MULTOUT=Y{(min1)STADAY2=<string>,STADAY3=<string>,
  STAHR2=<string>,STAHR3=<string>,PERIOD=<string>,
  SELSTOP=<Y\N>;
  ```

- Create a scheduled job to output to the DPS with:

  ```
  ADD-GEZAB:TYPE=L,DIAFNO=<number>,FILE=<character>,
  FILESTA=<string>,FILEND=<string>,DEV=DP,CALLUP=<Y\N>,
  DEL=<Y\N>,FORM=<string>,BLKSIZE=<number>,FOUT=<Y\N>,
  STAT=<string>,MULTOUT=Y{(min1)STADAY2=<string>,
  STADAY3=<string>,STAHR2=<string>,STAHR3=<string>},
  PERIOD=<string>,SELSTOP=<Y\N>;
  ```

- Create a scheduled job using a short dialog with:

  If the ADD-GEZAB action is started with "S" (short dialog), all parameters are changed except for CALLUP and PERIOD.

  – A long dialog must have already been added for the dialog field in question.
  – Stop the TIMEORDER ACTIVE status for the dialog field in question.
  – Change certain values in the dialog field in question using a short dialog.

  ```
  ADD-GEZAB:TYPE=S,DIAFNO=<number>,[FILE=<character>],
  [FILESTA=<string>],[FILEND=<string>],[DEV=<string>],
  [DEL=<Y\N>],[FORM=<string>],[BLKSIZE=<number>],
  [FOUT=<Y\N>],STAT=<string>,[MULTOUT=Y],
  {(min1)STADAY2=<string>,STADAY3=<string>,STAHR2=<string>,
  STAHR3=<string>},[SELSTOP=<Y\N>];
  ```

- Change certain parameters in a scheduled job using a short dialog with:

  If a scheduled job is activated for a dialog field, you can only rewrite the dialog field by stopping the scheduled job that is running (STOP-GEZAB). This changes the status of the dialog field from TIMEORDER ACTIVE to BUSY.

  With the CHA-GEZAB action, you can rewrite all parameters except PERIOD.

  ```
  CHA-GEZAB:DIAFNO=<number>,{(min1)FILE=<character>,
  ```

```
FILESTA=<string>,FILEND=<string>,DEV=<string>,CALLUP=<Y
\N>,
DEL=<Y\N>,FORM=<string>,BLKSIZE=<number>,FOUT=<Y\N>,
STAT=<string>,MULTOUT=Y},{(min1)STADAY2=<string>,
STADAY3=<string>,STAHR2=<string>,STAHR3=<string>},
[SELSTOP=<Y\N>];
```

- Cancel an active data output with:

  ```
  STOP-GEZAB:DIAFNO=<number>;
  ```
- Display the dialog fields with:

  ```
  DIS-GEZAB:[DIAFNO=<number>];
  ```
- Start immediate output with:

  Requirement: The dialog field in question must be configured.

  ```
  OUTPUT-GEZAB:DIAFNO=<number>;
  ```
- Delete a configured dialog field with:

  ```
  DEL-GEZAB:DIAFNO=<number>;
  ```

7.5 Call Charge Data - Immediate Output

7.5.1 Immediate Output to GC 3001 A

- Enter line allocation for connecting GC 3001A to line 17

  ```
  AD-ATCSM:UNIT=A1,TYPE=CFIG,CFIG=DEV,TYPENO=8,
  TERMDESC=ARCVCO,CNTRLNA=F8,T=30,ANSLNT=04,ANSLN=00,
  CNTRLND=02;

  AD-LCSM:UNIT=A1,MLNTYPE=ASYNC,TYPENO=8,BAUD=2400,
  LEN=7,STOPLEN=SL2_,TRNSCLK=INT,RCLK=INT;

  AD-ATCSM:UNIT=A1,TYPE=ADD,ALSEL=LN,TYPENO=8,LN=17;

  AC-BSSM:UNIT=A1,TYPE=BC,SLOT=13,KIND=ANT;

  AC-LSSM:UNIT=A1,LN=17;
  ```
- Configure CDR with immediate output to options
  `AD-FEACG:CM=CDRCDUMP;`
- Add CDR code to route code table
  `AD-RCUT:RTECD=0,CDRCODE=0;`
- Add device allocation

  ```
  AD-GEZU:TBL=TTY,NAMEOUT=DEV2,PHDEV=TTY,
  DEVCL=GC3001A;
  ```
- Create GC3001A format

  ```
  AD-FTBL:FORMNO=3,TYPE=B,TBL=FORM,NO=1,END=N,
  FORMAT=""*#@@+#@@@@+#+#@@+#@@@@@@@@@@@@@@+0+
  ```

```
#@@@@@@@@@@@@+#@@@@#@+#@@@@#@@@+"";

AD-FTBL:FORMNO=3,TYPE=B,TBL=CTRL,NO=2,END=N,
CTLCHARS=CR;

AD-FTBL:FORMNO=3,TYPE=B,TBL=CTRL,NO=3,END=Y,
CTLCHARS=LF;

AD-FTBL:FORMNO=3,TYPE=B,TBL=FIELD,NOFELD=1,
FLDNAME=TKNOREAL,FATTR=NONE,DATTR=NONE,
FILLTYPE=CHAR,FILLER=0,FLDALIGN=R;

AD-FTBL:FORMNO=3,TYPE=B,TBL=FIELD,NOFELD=2,
FLDNAME=CHRGEE,FATTR=NONE, DATTR=NONE,
FILLTYPE=CHAR,FILLER=0,FLDALIGN=R;

AD-FTBL:FORMNO=3,TYPE=B,TBL=FIELD,NOFELD=3,
FLDNAME=RECPT,FATTR=NONE,DATTR=NONE,FILLTYPE=CHAR,
FILLER=0,FLDALIGN=R;

AD-FTBL:FORMNO=3,TYPE=B,TBL=FIELD,NOFELD=4,
FLDNAME=CHRGUNIT,FATTR=NONE,DATTR=NONE,FILLTYPE=CHAR,
FILLER=0,FLDALIGN=R;

AD-FTBL:FORMNO=3,TYPE=B,TBL=FIELD,NOFELD=5,
FLDNAME=VDESTNO,FATTR=NONE,DATTR=NONE,FILLTYPE=CHAR,
FILLER= ,FLDALIGN=L;

AD-FTBL:FORMNO=3,TYPE=B,TBL=FIELD,NOFELD=6,
FLDNAME=PIN,FATTR=NONE,DATTR=NONE,FILLTYPE=CHAR,
FILLER= ,FLDALIGN=L;

AD-FTBL:FORMNO=3,TYPE=B,TBL=FIELD,NOFELD=7,
FLDNAME=CONHOUR,FATTR=NONE,DATTR=NONE,FILLTYPE=CHAR,
FILLER=0,FLDALIGN=R;

AD-FTBL:FORMNO=3,TYPE=B,TBL=FIELD,NOFELD=8,
FLDNAME=CONMIN,FATTR=NONE, DATTR=NONE,FILLTYPE=CHAR,
FILLER=0,FLDALIGN=R;

AD-FTBL:FORMNO=3,TYPE=B,TBL=FIELD,NOFELD=9,
FLDNAME=CONSEC,FATTR=NONE,DATTR=NONE,FILLTYPE=CHAR,
FILLER=0,FLDALIGN=R;

AD-FTBL:FORMNO=3,TYPE=B,TBL=FIELD,NOFELD=10,
FLDNAME=ENDMONTH,FATTR=NONE,DATTR=NONE,FILLTYPE=CHAR,
FILLER=0,FLDALIGN=R;

AD-FTBL:FORMNO=3,TYPE=B,TBL=FIELD,NOFELD=11,
FLDNAME=ENDDAY,FATTR=NONE, DATTR=NONE,FILLTYPE=CHAR,
FILLER=0,FLDALIGN=R;

AD-FTBL:FORMNO=3,TYPE=B,TBL=FIELD,NOFELD=12,
FLDNAME=ENDHOUR,FATTR=NONE,DATTR=NONE,FILLTYPE=CHAR,
FILLER=0,FLDALIGN=R;
```

```
AD-FTBL:FORMNO=3,TYPE=B,TBL=FIELD,NOFELD=13,
FLDNAME=ENDMINR,FATTR=NONE,DATTR=NONE,FILLTYPE=CHAR,
FILLER=0,FLDALIGN=R;

AD-FTBL:FORMNO=3,TYPE=B,TBL=FIELD,NOFELD=14,
FLDNAME=ENDSEC,FATTR=NONE,DATTR=NONE,FILLTYPE=CHAR,
FILLER=0,FLDALIGN=R;
```

- Add selection group

```
AD-SELG:TBL=SELG,SELGNO=4,RESOP=Y,BASDEV=DEV2,
RESDEV=DEV1,BLBAS=1,BLRES=1;

AD-SELG:TBL=SELT,SELGNO=4,SELTABNO=1,FORMBAS=FORM03,
FORMRES=FORM03,TARIF=NOCALC,DESTCNT=A22,CDRCD=0&&999999,
SERVICE=VOICE,ATNDGR=0&&15,CTYPE=ALL,PAYPARTY=ALL,
CDRC=N,CDRSTA=N,THRGCON=N,NSTAT=N,SECTION=N,CDCHU=N,
CDRAC=N,SFSETUP=N,CDBAD=N,CDRULTE=N,CONNT=N,PCODE=N,
PPCF=N,STATAB1=N,STATAB2=N,DNOTBL1=N,DNOTBL2=N,CDRULT=0,
CONNTL=000000,LEVEL0=0&&999,LEVEL1=0&&254,LEVEL2=0&&30,
TIELINE=N,EXPENS=N,CONNTYP=ALL,COPIN=0&&8,CARRIER=0&&9;
```

- Activate immediate output of call charge data to options
  `AC-SELS:SELGRNO=4;`

7.5.2 Immediate Output to CDRC1 File on HD

The output format is defined as FORM01 when setting up the CDR data output request to options with the GEZAB AMO (Format 1, for output to TTY).

- Create a selection
  `AD-FEACG:CM=CDRCDUMP&CDRCDIS;`
- Assign "Segmentation Tables" (DTAR=standard/daytime rates, NTAR1 cheap/night rate 1, NTAR2 cheap/night rate 2)

```
AD-TABT:LT=06-00,TARTYPMO=NTAR2,TARTYPTU=NTAR2,
TARTYPWE=NTAR2,TARTYPTH=NTAR2,TARTYPFR=NTAR2,
TARTYPSA=NTAR2,TARTYPSU=NTAR2,TBLNO=1;

AD-TABT:LT=08-00,TARTYPMO=NTAR1,TARTYPTU=NTAR1,
TARTYPWE=NTAR1,TARTYPTH=NTAR1,TARTYPFR=NTAR1,
TARTYPSA=NTAR1,TARTYPSU=NTAR2;

AD-TABT:LT=14-00,TARTYPMO=DTAR,TARTYPTU=DTAR,
TARTYPWE=DTAR,TARTYPTH=DTAR,TARTYPFR=DTAR,
TARTYPSA=T,TARTYPSU=NTAR2;

AD-TABT:LT=18-00,TARTYPMO=DTAR,TARTYPTU=DTAR,
TARTYPWE=DTAR,TARTYPTH=DTAR,TARTYPFR=DTAR,
TARTYPSA=N2,TARTYPSU=NTAR2;

AD-TABT:LT=22-00,TARTYPMO=NTAR1,TARTYPTU=NTAR1,
TARTYPWE=NTAR1,TARTYPTH=NTAR1,TARTYPFR=NTAR1,
TARTYPSA=NTAR2,TARTYPSU=NTAR2;

AD-TABT:LT=24-00,TARTYPMO=NTAR2,TARTYPTU=NTAR2,
```

```
TARTYPWE=NTAR2,TARTYPTH=NTAR2,TARTYPFR=NTAR2,
TARTYPSA=NTAR2,TARTYPSU=NTAR2;
```

- Assign the tariff and tariff group tables
  - Assign the tariff table for connections with call charge information

    ```
    AD-TTBL:TBL=WCU,TARTBLNO=1,TARMIN=0,METHOD=FACTOR,
    FACTOR=100,LT1=0,TAR1=500;
    ```
  - Assign the tariff table for connections without call charge information

    ```
    AD-TTBL:TBL=WOCU,TARTBLNO=1,ZONE=DIST01,INTDAY=10,
    TARDAY=10,INTNT1=10,NTAR1=10,INTNT2=10,NTAR2=10,
    INTNT3=10,NTAR3=10, INTNT4=10,NTAR4=10,TARBAS=100,
    TARMIN=0,SEGTBLNO=1,CHPER=Y;
    ```
  - Assign tariff group

    ```
    ADD-TTBL:TBL=GRP,GRNO=1,CARRIER=0,SERVICE=VOICE,
    TARTBLNO=1,CATPTY=NORM;
    ```
- Add CDR code to route code table
  `AD-RCUT:RTECD=0,CDRCODE=0;`
- Add selection group for CDR with immediate output to options (HD)

  ```
  AD-SELG:TBL=SELG,SELGNO=1,RESOP=Y,BASDEV=CDRC1,
  RESDEV=NODEV,BLBAS=1, BLRES=0;

  AD-SELG:TBL=SELT,SELGNO=1,SELTABNO=1,FORMBAS=HDFORM,
  FORMRES=NOFORM,TARIF=TARGR01,DESTCNT=A22,CDRCD=0&&999999,
  SERVICE=VOICE&TTC,ATNDGR=0&&15,CTYPE=ALL,PAYPARTY=ALL,
  CDRC=N,CDRSTA=N,THRGCON=N,NSTAT=N,SECTION=N,CDCHU=N,
  CDRAC=N,SFSETUP=N,CDBAD=N,CDRULTE=N,CONNT=N,
  PCODE=N,PPCF=N,STATAB1=N,STATAB2=N,DNOTBL1=N,DNOTBL2=N,
  CDRULT=0,CONNTL=000000,LEVEL0=0&&999,LEVEL1=0&&254,
  LEVEL2=0&&30,TIELINE=N,EXPENS=N,CONNTYP=ALL,COPIN=0&&8,
  CARRIER=0&&9;
  ```
- Activate CDR with immediate output to options (TTY)
  `AC-SELS:SELGRNO=1;`

7.5.3 Immediate Output to File Transfer File on HD

The output format is defined as FORM01 (Format 1, for output to TTY).

- Create a selection
  `AD-FEACG:CM=CDRCDUMP;`
- Assign "Segmentation Tables" (DTAR=standard/daytime rates, NTAR1 cheap/night rate 1, NTAR2 cheap/night rate 2)

  ```
  AD-TABT:LT=06-00,TARTYPMO=NTAR2,TARTYPTU=NTAR2,
  TARTYPWE=NTAR2,TARTYPTH=NTAR2,TARTYPFR=NTAR2,
  TARTYPSA=NTAR2,TARTYPSU=NTAR2,TBLNO=1;

  AD-TABT:LT=08-00,TARTYPMO=NTAR1,TARTYPTU=NTAR1,
  TARTYPWE=NTAR1, TARTYPTH=NTAR1,TARTYPFR=NTAR1,
  TARTYPSA=NTAR1,TARTYPSU=NTAR2;
  ```

```
AD-TABT:LT=14-00,TARTYPMO=DTAR,TARTYPTU=DTAR,
TARTYPWE=DTAR,TARTYPTH=DTAR,TARTYPFR=DTAR,
TARTYPSA=T,TARTYPSU=NTAR2;

AD-TABT:LT=18-00,TARTYPMO=DTAR,TARTYPTU=DTAR,
TARTYPWE=DTAR,TARTYPTH=DTAR,TARTYPFR=DTAR,
TARTYPSA=N2,TARTYPSU=NTAR2;

AD-TABT:LT=22-00,TARTYPMO=NTAR1,TARTYPTU=NTAR1,
TARTYPWE=NTAR1,TARTYPTH=NTAR1,TARTYPFR=NTAR1,
TARTYPSA=NTAR2,TARTYPSU=NTAR2;

AD-TABT:LT=24-00,TARTYPMO=NTAR2,TARTYPTU=NTAR2,
TARTYPWE=NTAR2,TARTYPTH=NTAR2,TARTYPFR=NTAR2,
TARTYPSA=NTAR2,TARTYPSU=NTAR2;
```

- Assign the tariff and tariff group tables
  - Assign the tariff table for connections with call charge information

    ```
    AD-TTBL:TBL=WCU,TARTBLNO=1,TARMIN=0,METHOD=FACTOR,
    FACTOR=100,LT1=0,TAR1=500;
    ```
  - Assign the tariff table for connections without call charge information

    ```
    AD-TTBL:TBL=WOCU,TARTBLNO=1,ZONE=DIST01,INTDAY=10,
    TARDAY=10,INTNT1=10,NTAR1=10,INTNT2=10,NTAR2=10,
    INTNT3=10,NTAR3=10, INTNT4=10,NTAR4=10,TARBAS=100,
    TARMIN=0,SEGTBLNO=1,CHPER=Y;
    ```
  - Assign tariff group

    ```
    ADD-TTBL:TBL=GRP,GRNO=1,CARRIER=0,SERVICE=VOICE,
    TARTBLNO=1,CATPTY=NORM;
    ```
- Add CDR code to route code table

  ```
  AD-RCUT:RTECD=0,CDRCODE=0;
  ```
- Add selection group for CDR with immediate output to options (HD)

  ```
  AD-
  SELG:TBL=SELG,SELGNO=1,RESOP=Y,BASDEV=FT,RESDEV=NODEV,
  BLBAS=1, BLRES=0;

  AD-SELG:TBL=SELT,SELGNO=1,SELTABNO=1,FORMBAS=HDFORM,
  FORMRES=NOFORM,TARIF=TARGR01,DESTCNT=A22,CDRCD=0&&999999,
  SERVICE=VOICE&TTC,ATNDGR=0&&15,CTYPE=ALL,PAYPARTY=ALL,
  CDRC=N,CDRSTA=N,THRGCON=N,NSTAT=N,SECTION=N,CDCHU=N,
  CDRAC=N,SFSETUP=N,CDBAD=N,CDRULTE=N,CONNT=N,PCODE=N,
  PPCF=N,STATAB1=N,STATAB2=N,DNOTBL1=N,DNOTBL2=N,CDRULT=0,
  CONNTL=000000,LEVEL0=0&&999,LEVEL1=0&&254,LEVEL2=0&&30,
  TIELINE=N,EXPENS=N,CONNTYP=ALL,COPIN=0&&8,CARRIER=0&&9;
  ```
- Activate CDR with immediate output to options (TTY)

  ```
  AC-SELS:SELGRNO=1;
  ```

7.5.4 Immediate Output to Magnetic Tape Device

- Add device allocation

```
AD-GEZU:TBL=TTY,NAMEOUT=DEV1,PHDEV=TTY,
DEVCL=TERM1;
```

- Configure CDR with immediate output to options

```
AD-FEACG:CM=CDRCDUMP;
```

- Assign "Segmentation Tables" (DTAR=standard/daytime rates, NTAR1 cheap/night rate 1, NTAR2 cheap/night rate 2)

```
AD-TABT:LT=0600,TARTYPMO=NTAR2,TARTYPTU=NTAR2,
TARTYPWE=NTAR2,TARTYPTH=NTAR2,TARTYPFR=NTAR2,
TARTYPSA=NTAR2,TARTYPSU=NTAR2,TBLNO=1;

AD-TABT:LT=08-00,TARTYPMO=NTAR1,TARTYPTU=NTAR1,
TARTYPWE=NTAR1,TARTYPTH=NTAR1,TARTYPFR=NTAR1,
TARTYPSA=NTAR1,TARTYPSU=NTAR2;

AD-TABT:LT=14-00,TARTYPMO=DTAR,TARTYPTU=DTAR,
TARTYPWE=DTAR,TARTYPTH=DTAR,TARTYPFR=DTAR,
TARTYPSA=T,TARTYPSU=NTAR2;

AD-TABT:LT=18-00,TARTYPMO=DTAR,TARTYPTU=DTAR,
TARTYPWE=DTAR,TARTYPTH=DTAR,TARTYPFR=DTAR,
TARTYPSA=N2,TARTYPSU=NTAR2;

AD-TABT:LT=22-00,TARTYPMO=NTAR1,TARTYPTU=NTAR1,
TARTYPWE=NTAR1, TARTYPTH=NTAR1,TARTYPFR=NTAR1,
TARTYPSA=NTAR2,TARTYPSU=NTAR2;

AD-TABT:LT=24-00,TARTYPMO=NTAR2,TARTYPTU=NTAR2,
TARTYPWE=NTAR2,TARTYPTH=NTAR2,TARTYPFR=NTAR2,
TARTYPSA=NTAR2,TARTYPSU=NTAR2;
```

- Assign the tariff and tariff group tables
  - Assign the tariff table for connections with call charge information

```
AD-TTBL:TBL=WCU,TARTBLNO=1,TARMIN=0,
METHOD=FACTOR,FACTOR=100,LT1=0,TAR1=500;
```

  - Assign the tariff table for connections without call charge information

```
AD-TTBL:TBL=WOCU,TARTBLNO=1,ZONE=DIST01,
INTDAY=10,TARDAY=10,INTNT1=10,NTAR1=10,
INTNT2=10,NTAR2=10,INTNT3=10,NTAR3=10,
INTNT4=10,NTAR4=10,TARBAS=100,TARMIN=0,
SEGTBLNO=1,CHPER=Y;
```

  - Assign tariff group

```
ADD-TTBL:TBL=GRP,GRNO=1,CARRIER=0,
SERVICE=VOICE,TARTBLNO=1,CATPTY=NORM;
```

- Add CDR code to route code table

```
AD-RCUT:RTECD=0,CDRCODE=0;
```

- Add selection group for CDR with immediate output to options (tape)

```
AD-SELG:TBL=SELG,SELGNO=3,RESOP=Y,BASDEV=TAPE,
RESDEV=DEV1,BLBAS=1,BLRES=1;
```

```
AD-SELG:TBL=SELT,SELGNO=3,SELTABNO=1,FORMBAS=FORM01,
FORMRES=FORM01,TARIF=TAR01,DESTCNT=A22,CDRCD=0&&999999,
SERVICE=VOICE&TTC,ATNDGR=0&&15,CTYPE=ALL,PAYPARTY=ALL,
CDRC=N,CDRSTA=N,THRGCON=N,NSTAT=N,SECTION=N,CDCHU=N,
CDRAC=N,SFSETUP=N,CDBAD=N,CDRULTE=N,CONNT=N,PCODE=N,
PPCF=N,STATAB1=N,STATAB2=N,DNOTBL1=N,DNOTBL2=N,CDRULT=0,
CONNTL=000000,LEVEL0=0&&999,LEVEL1=0&&254,LEVEL2=0&&30,
TIELINE=N,EXPENS=N,CONNTYP=ALL,COPIN=0&&8,CARRIER=0&&9;
```

- Activate immediate output of call charge data to options (magnetic tape)
  `AC-SELS:SELGRNO=1;`

7.5.5 Immediate Output to PT80i (Optional Device)

The output format is defined as FORM01 in the GEZAB AMO (Format 1 for output to TTY).

- Configure CDR for immediate output to options
  `AD-FEACG:CM=CDRCDUMP;`
- Add device allocation

```
AD-GEZU:TBL=TTY,NAMEOUT=DEV1,PHDEV=TTY,
DEVCL=TERM1;

AD-GEZU:TBL=TTY,NAMEOUT=DEV2,PHDEV=TTY,
DEVCL=TERM2;
```

- Assign "Segmentation Tables" (DTAR=standard/daytime rates, NTAR1 cheap/night rate 1, NTAR2 cheap/night rate 2)

```
AD-TABT:LT=06-00,TARTYPMO=NTAR2,TARTYPTU=NTAR2,
TARTYPWE=NTAR2,TARTYPTH=NTAR2,TARTYPFR=NTAR2,
TARTYPSA=NTAR2,TARTYPSU=NTAR2,TBLNO=1;

AD-TABT:LT=08-00,TARTYPMO=NTAR1,TARTYPTU=NTAR1,
TARTYPWE=NTAR1, TARTYPTH=NTAR1,TARTYPFR=NTAR1,
TARTYPSA=NTAR1,TARTYPSU=NTAR2;

AD-TABT:LT=14-00,TARTYPMO=DTAR,TARTYPTU=DTAR,
TARTYPWE=DTAR,TARTYPTH=DTAR,TARTYPFR=DTAR,
TARTYPSA=T,TARTYPSU=NTAR2;

AD-TABT:LT=18-00,TARTYPMO=DTAR,TARTYPTU=DTAR,
TARTYPWE=DTAR,TARTYPTH=DTAR,TARTYPFR=DTAR,
TARTYPSA=N2,TARTYPSU=NTAR2;

AD-TABT:LT=22-00,TARTYPMO=NTAR1,TARTYPTU=NTAR1,
TARTYPWE=NTAR1,TARTYPTH=NTAR1,TARTYPFR=NTAR1,
TARTYPSA=NTAR2,TARTYPSU=NTAR2;

AD-TABT:LT=24-00,TARTYPMO=NTAR2,TARTYPTU=NTAR2,
TARTYPWE=NTAR2,TARTYPTH=NTAR2,TARTYPFR=NTAR2,
TARTYPSA=NTAR2,TARTYPSU=NTAR2;
```

- Assign the tariff and tariff group tables
  - Assign the tariff table for connections with call charge information
    `AD-TTBL:TBL=WCU,TARTBLNO=1,TARMIN=0,`

```
METHOD=FACTOR,FACTOR=100,LT1=0,TAR1=500;
```

– Assign the tariff table for connections without call charge information

```
AD-TTBL:TBL=WOCU,TARTBLNO=1,ZONE=DIST01,
INTDAY=10,TARDAY=10, INTNT1=10,NTAR1=10,
INTNT2=10,NTAR2=10,INTNT3=10,NTAR3=10,
INTNT4=10,NTAR4=10,TARBAS=100,TARMIN=0,
SEGTBLNO=1,CHPER=Y;
```

– Assign tariff group

```
ADD-TTBL:TBL=GRP,GRNO=1,CARRIER=0,
SERVICE=VOICE,TARTBLNO=1,CATPTY=NORM;
```

- Add CDR code to route code table
  `AD-RCUT:RTECD=0,CDRCODE=0;`
- Add selection group for immediate output to options (printer)

```
AD-SELG:TBL=SELG,SELGNO=1,RESOP=Y,BASDEV=DEV1,
RESDEV=DEV2,BLBAS=1,BLRES=1;

AD-SELG:TBL=SELT,SELGNO=1,SELTABNO=1,FORMBAS=FORM01,
FORMRES=FORM01,TARIF=TARGR01,DESTCNT=A22,CDRCD=0&&999999,
SERVICE=VOICE&TTC,ATNDGR=0&&15,CTYPE=ALL,PAYPARTY=ALL,
CDRC=N,CDRSTA=N,THRGCON=N,NSTAT=N,SECTION=N,CDCHU=N,
CDRAC=N,SFSETUP=N,CDBAD=N,CDRULTE=N,CONNT=N,PCODE=N,
PPCF=N,STATAB1=N,STATAB2=N,DNOTBL1=N,DNOTBL2=N,CDRULT=0,
CONNTL=000000,LEVEL0=0&&999,LEVEL1=0&&254,LEVEL2=0&&30,
TIELINE=N;

EXPENS=N,CONNTYP=ALL,COPIN=0&&8,CARRIER=0&&9;
```

- Activate CDR with immediate output to options (TTY)
  `AC-SELS:SELGRNO=1;`

7.6 Call Charge Output

7.6.1 Output Format 1

Format 1 is an output format for call data recording.

Formats 1 to 16: Standard formats

These are formats that can be selectively chosen with the parameters FORMBAS (output format for the base device) and FORMRES (output format for the reserve device) in the AMO SELG and AMO GEZAB. All variable fields can appear in these formats.

Formats 17 to 24: Formats for block start (base device)

You can use the parameters BLBAS (block size for the base device) and BLRES (block size for the reserve device) in the AMO SELZ to define block sizes for the output. The block size specifies how many call data records are blocked in a contiguous output. Formats 17-24 are entered in selection groups 1-4 (format 17 in selection group 1, format 18 in selection group 2, etc.) each time a block of this kind is started.

Formats 25 to 32: Formats for block start (reserve device)

See formats 17-24; but only for reserve device.

Formats 33 to 40: Formats for block end (base device)

See formats 17-24; but only for block end and base device.

Formats 41 to 48: Formats for block end (reserve device)

See formats 17-24; but only for block end and reserve device.

The formats (17 - 48) for the selection groups contain gaps because the number of selection groups was reduced to 4.

Formats 49 to 56: Formats for block start (dialog/output on callup)

In the AMO GEZAB, you can use the parameter BLKSIZE (block size, number of records per output block) to define block sizes for output in a dialog. Formats 49 - 56 are output in dialog fields 1 - 8 (format 49 in dialog field 1, etc.) each time a block of this kind is started.

Formats 57 to 64: Formats for block end (dialog/output on callup)

See formats 49-56; but only for block end.

Formats 65 to 72: Formats for data end in a file (dialog/output on callup)

These formats are output when the actual call data output has ended.

Formats 73 to 80: Formats for "empty files" (dialog/output on callup)

These formats are output if the selected file is empty.

Formats 81 to 88: Formats for "deleted files" (dialog/output on callup)

These formats are output if a file is deleted after a delete job.

Formats 89 to 96: Formats for cancelling the output

These formats are output if the system calls for the data output to be cancelled.

Formats 97 to 109: Formats for CDRS output

These formats are needed for CDRS output.

In formats 17 to 96, only the variable data elements output time, block length, and number of records per block are allowed.

Configure output format 1:

```
ADD-FTBL:FORMNO=1,TYPE=B,TBL=FORM,NO=1,END=N,
FORMAT="DEST. NO:#@@@@@@@@@@@@@@@@@@@@ STN.
NO:#@@@@@@ COSTS:";

ADD-FTBL:FORMNO=1,TYPE=B,TBL=FORM,NO=2,END=N,,
FORMAT="#@@@@@@@ EUR CHRG. UNIT:#@@@ CALL DUR:
#@:#@:#@";

ADD-FTBL:FORMNO=1,TYPE=B,TBL=CTRL,NO=3,END=N,
CTLCHARS=CR;

ADD-FTBL:FORMNO=1,TYPE=B,TBL=CTRL,NO=4,END=Y,
CTLCHARS=LF;

ADD-FTBL:FORMNO=1,TYPE=B,TBL=FIELD,NOFELD=1,
```

```
FLDNAME=DESTPTY,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-FTBL:FORMNO=1,TYPE=B,TBL=FIELD,NOFELD=2,
FLDNAME=CHRGEE,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=1,TYPE=B,TBL=FIELD,NOFELD=3,FLDNAME=CONCHRG,,
FILLTYPE=CHAR,FILLER=" ",FLDALIGN=RC,COMPOS=6;

ADD-FTBL:FORMNO=1,TYPE=B,TBL=FIELD,NOFELD=4,
FLDNAME=CHRGUNIT,FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=1,TYPE=B,TBL=FIELD,NOFELD=5,FLDNAME=CONHOUR,
FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-FTBL:FORMNO=1,TYPE=B,TBL=FIELD,NOFELD=6,FLDNAME=CONMIN,
FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-FTBL:FORMNO=1,TYPE=B,TBL=FIELD,NOFELD=7,FLDNAME=CONSEC,
FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;
```

The format now looks as follows:

Output example:

Four data records with the destination number 04511, station number 3101, call charge units 1, call duration 3 seconds and the tariff of 23 cent/call charge unit.

```
DEST. NO:04511 STN. NO:3101 COSTS:00000.23 EUR CHRG.
UNIT:1 CALL DUR: 00:00:03

DEST. NO:04511 STN. NO:3101 COSTS:00000.23 EUR CHRG.
UNIT:1 CALL DUR: 00:00:03

DEST. NO:04511 STN. NO:3101 COSTS:00000.23 EUR CHRG.
UNIT:1 CALL DUR: 00:00:03

DEST. NO:04511 STN. NO:3101 COSTS:00000.23 EUR CHRG.
UNIT:1 CALL DUR: 00:00:03
```

7.6.2 Charge Output at the ATND (CDRATND)

- Enable the required CDRATND feature (attendant console)
  `ADD-FEACG:CM=CDRATND;`

  NOTICE: If the parameter TARIF=NOCALC was set in the AMO SELG and the parameter TYPE=WITHOUT was set in the AMO GEFE, only the call duration is shown on the attendant console display.

- Segmentation table (T=day tariff, N1=night tariff 1, N2=night tariff 2):

  ```
  ADD-TABT:LT=06-00,TARTYPMO=NTAR2,TARTYPTU=NTAR2,
  ```

```
TARTYPWE=NTAR2,TARTYPTH=NTAR2,TARTYPFR=NTAR2,
TARTYPSA=NTAR2,TARTYPSU=NTAR2, SEGTBLNO=1;

ADD-TABT:LT=08-00,TARTYPMO=NTAR1,TARTYPTU=NTAR1,
TARTYPWE=NTAR1,TARTYPTH=NTAR1,TARTYPFR=NTAR1,
TARTYPSA=NTAR1,TARTYPSU=NTAR2;

ADD-TABT:LT=14-00,TARTYPMO=DTAR,TARTYPTU=DTAR,
TARTYPWE=DTAR,TARTYPTH=DTAR,TARTYPFR=DTAR,
TARTYPSA=DTAR,TARTYPSU=NTAR2;

ADD-TABT:LT=18-00,TARTYPMO=DTAR,TARTYPTU=DTAR,
TARTYPWE=DTAR,TARTYPTH=DTAR,TARTYPFR=DTAR,
TARTYPSA=NTAR2,TARTYPSU=NTAR2;

ADD-TABT:LT=22-00,TARTYPMO=NTAR1,TARTYPTU=NTAR1,
TARTYPWE=NTAR1,TARTYPTH=NTAR1,TARTYPFR=NTAR1,
TARTYPSA=NTAR2,TARTYPSU=NTAR2;

ADD-TABT:LT=24-00,TARTYPMO=NTAR2,TARTYPTU=NTAR2,
TARTYPWE=NTAR2,TARTYPTH=NTAR2,TARTYPFR=NTAR2,
TARTYPSA=NTAR2,TARTYPSU=NTAR2;
```

- Add tariff group:
  - Add the tariff table with call charge information:

    ```
    ADD-TTBL:TBL=WCU,TARTBLNO=1,TARMIN=0,METHOD=FACTOR,
    FACTOR=100,LT1=0,TARIF1=500;
    ```
  - Add the tariff table without call charge information:

    ```
    ADD-TTBL:TBL=WOCU,TARTBLNO=1,ZONE=DIST01,INTDAY=10,
    TARDAY=10 ,INTNT1=10,NTAR1=10,INTNT2=10,NTAR2=10,
    INTNT3=10, NTAR3=10 ,INTNT4=10,NTAR4=10,TARBAS=100,
    TARMIN=0,SEGTBLNO=1,CHPER=Y;
    ```
  - Add tariff group table 1:

    ```
    ADD-TTBL:TBL=GRP,GROUPNO=1,CARRIER=0,SERVICE=VOICE,
    TARTBLNO=1,METHOD=FACTOR;
    ```
- Add currency identifier:
  `CHA-DAVF:COMPOS=+2,NAME="EUR";`
- Add routing code table (tie trunk connection yes/no):
  `ADD-RCUT:RTECD=0,CDRCODE=0;`
- Selection group for attendant console
  - Delete selection group 3:
    `DEL-SELG:SELGNO=3;`
  - Add selection group 3:

    ```
    ADD-SELG:TBL=SELG,SELGNO=3,RESOP=N,BASDEV=ATTEND,
    RESDEV=NODEV,BLBAS=1,BLRES=0;
    ```
  - Add selection group 3 with selection table 1 (voice connection VOICE):

    ```
    ADD-SELG:TBL=SELT,SELGNO=3,SELTABNO=1,FORMBAS=ATTEND,
    FORMRES=NOFORM,TARIF=TARGR01,DESTCNT=A22,CDRCD=0&&999999,
    SERVICE=VOICE,ATNDGR=0&&15,CTYPE=ALL,PAYPARTY=ALL,CDRC=N,
    CDRSTA=N,THRGCON=N,NSTAT=N,SECTION=N,CDCHU=N,CDRAC=STN,
    ```

```
SFSETUP=N,CDBAD=N,CDRULTE=N,CONNT=N,PCODE=N,PPCF=N,
STATAB1=N,STATAB2=N,DNOTBL1=N,DNOTBL2=N,CDRULT=0,
CONNTL=000000,LEVEL0=0&&999,LEVEL1=0&&254,LEVEL2=0&&30,
TIELINE=N,EXPENS,CONNTYP=ALL,COPIN=0&&15,CARRIER=0&&9,
RECTYP=ALL;
```

– Add selection group 3 with selection table 2 (communication service FAX):

```
ADD-SELG:TBL=SELT,SELGNO=3,SELTABNO=2,FORMBAS=ATTEND,
FORMRES=NOFORM,TARIF=TARGR01,DESTCNT=A22,CDRCD=0&&999999
,SERVICE=FAX,ATNDGR=0&&15,CTYPE=ALL,PAYPARTY=ALL,CDRC=N,
CDRSTA=N ,THRGCON=N,NSTAT=N,SECTION=N,CDCHU=N,CDRAC=STN,
SFSETUP=N,CDBAD=N,,CDRULTE=N,CONNT=N,PCODE=N,PPCF=N,
STATAB1=N,STATAB2=N ,DNOTBL1=N,DNOTBL2=N,CDRULT=0,
CONNTL=000000,
 LEVEL0=0&&999 ,LEVEL1=0&&254,LEVEL2=0&&30,
TIELINE=N,EXPENS=N,CONNTYP=ALL ,COPIN=0&&15,CARRIER=0&&9,
RECTYP=ALL;
```

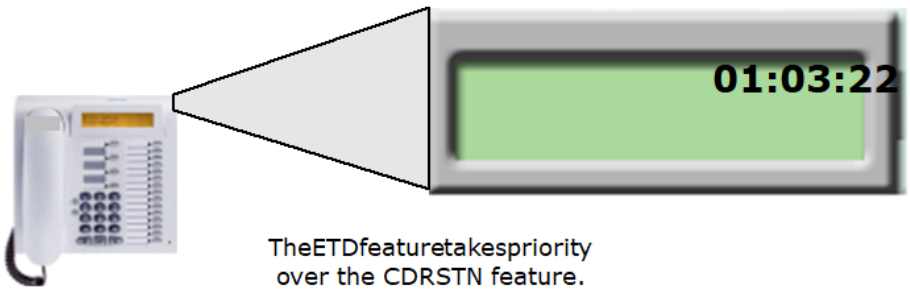
- Activate selection group 3:
  `ACT-SELS:SELGRNO=3;`

Display call charge data at the attendant console

- Change the decimal point position or currency unit:
  `CHA-DAVF:COMPOS=<number>,NAME=<string>;`
- Call up the display (decimal point position and currency unit) on the attendant console:
  `DIS-DAVF;`

7.7 Call Charge Recording-Elapsed Time Display

7.7.1 Overview



7.7.2 Feature Description

Display of elapsed time at station terminal during incoming or outgoing trunk calls.

7.7.3 User Interface

It is possible to display the time elapsed (parameter ETD in AMSO SDAT) instead of the call charges (parameter CDRSTN in AMO COSSU) at the station terminal during incoming or outgoing trunk calls. While CDRSTN is set up through the COS, ETD is set up on a per-subscriber basis with ETD taking priority over CDRSTN. This means that if both parameters are configured, the display shows the time elapsed and not the call charges recorded.

7.7.4 Service Information

No special requirements.

Time is displayed in the format 00:00:00, i.e. hh:mm:ss.

7.7.5 Generation (Example)

Activation:
`CHANGE-SDAT:STNO=<number>, TYPE=ATTRIBUT, AATTR=ETD;`

Deactivation:
`CHANGE-SDAT:STNO=<number>, TYPE=ATTRIBUT, DATTR=ETD;`

7.7.6 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
SDAT	AMERK	d	Teilnehmermerkmal ausfügen / deaktivieren ETD: Anzeige der vergangenen Zeit
	DATTR	e	delete subscriber attribute ETD: elapsed time display
	EMERK	d	Teilnehmermerkmal einfügen / aktivieren ETD: Anzeige der vergangenen Zeit
	ATTRIB	e	activate individual subscriber attribute ETD: elapsed time display

7.8 Central Configuration

Call data recording is activated when charges are shown on the display. The call data recording tariff tables must be configured to ensure the correct charges appear on the Digite display. Likewise, you must configure central and line-dependent data in the SWU using AMOs. The following chapter will show how to configure the nodes in single and networked communication systems in order

to set a certain charge feature. This chapter uses examples to examine the following features:

- Activate/deactivate call data recording
- Charge display on the device

The other features (charge output, DPS, etc.) are described in separate AMO application cases.

IMPORTANT: Charges are only displayed if the data is consistent which means that the currency is correct and the charge type (amounts/units) corresponds to what is to be displayed.

7.8.1 Flexible Memory Management

Buffer memory, the so-called COSTI buffer, is needed in the SWU to save the call charge data for chargeable connections. The number of COSTI buffers that are set up after initial startup is dimensioned in such a way that all outgoing trunks and tie trunks can be recorded with charges.

You must expand the memory if you want incoming connections and/or internal connections to also have the charges recorded. The same applies if CDR-e is used:

COMMAND
`ADD-DIMSU:TYPE=BASIC,COSTI=<number>;`

7.8.2 Central System Data

7.8.2.1 Affected AMOs

7.8.2.1.1 AMO ZAND

Use the remaining data to define the form of the charge display on the device in the type branch CCD.

CCUC:	Conversion factor = amount per unit; used to calculate units from amounts (for example, for stations with call charge pulse display)
CDDISPEX:	= AMOUNT system with call charge amounts = UNIT: system with call charge units
CDDISPAT:	= 1: 1-line call charge display on attendant console = 2: 2-line call charge display on attendant console
CDRRINGB:	= YES: Call data recording active with end of dialing = NO: not active

NETPROV:	= YES: Save network-provided number for incoming CDR . = NO: do not save

7.8.2.1.2 AMO FEASU

Call-charge-specific parameters:

NOCHRG:	No charge (valid for MFC-R2 incoming (for example, Switzerland feature for no-charge troubleshooting services))
DISCHTR, DISCHNW, DISCHINH:	Central activation/deactivation of the call charge display for different traffic types (outgoing/incoming CO, outgoing/incoming networking, internal). The meaning is described in the following sections.
CDRIC, CDROGTR, CDROGNW, CDRINH:	Central activation/deactivation of the call charge display for different traffic types (incoming CO/networking, outgoing CO, outgoing networking, internal). The meaning is described in the following sections.
CPS:	Central activation/deactivation of the call charge pulse transmission and measurement (RURAL). The meaning is described in the following sections.
CDRE:	Central activation/deactivation of call data recording enhancements).

7.8.2.1.3 AMO FEACG

```
ADD-FEACG:CM=<param>;
```

IMPORTANT: If call data recording was not activated with the AMO FEACG, then only the display is active.

7.8.2.1.4 AMO CTIME

Call-charge-specific parameters:

DISPCH:	Time intervals at which the call charge display is updated.
CDRDISDE:	Period of time post-cleardown after which the charge display will be deleted.

7.8.2.1.5 AMO KNMAT

You must select the node connection matrix with open numbering. In addition to the general configuration rules (described in the Networking/Station modification chapter), you must set up the matrix so that a modification between the own node and the logical destination node CDR must be entered on those nodes on which call data recording is active. Enter extensions with the corresponding node ID. The reason is that a unique station number for the chargeable station is always provided to the call data recording. In exceptional cases, a shortcut for the logical destination node CDR can also be selected (if the station numbers get to be too long, for example).

In addition, you must use the AMO GEFE to inform the call data recording which of the recorded station numbers should be modified with the networking matrix. This can be done separately for internal (KNMATINT), incoming (KNMATINC), and outgoing (KNMATOUT), depending on the type of connection.

For example, the CALLING Party and the KEY LINE USED should be modified for outgoing connections:

```
CHANGE-GEFE:TYPPARAM=KNMATOUT,PARTY=CALLIPTY&KEYPTY;
```

7.8.2.1.6 AMO KNPRE

With the AMO KNPRE, a national or international (dialing) prefix can be configured in the "Private" or "ISDN" numbering plan, depending on the DPLN.

With the AMO GEFE, call data recording can be arranged so that the recorded station numbers are supplemented by the corresponding prefix, depending on the DPLN and numbering plan. This can be done separately for internal (PREINT), incoming (PREINC), and outgoing (PREOUT), depending on the connection type.

For example: DPLN 0, ISDN numbering plan, national prefix, access code 6, dial 009

1)
```
ADD-
KNPRE:DPLN=0,NPI=ISDN,TON=NATIONAL,EXIT=6,PREFIX=009;
```

7.8.2.2 Configuration Commands for Central System Data

1) Set the node connection matrix with the following AMOs:

In the example in Figure 91, the following is set on physical node 20 (physical node ID 99):

```
CHA-ZAND:TYPE=ALLDATA,PNNO=20,PNODECD=99;

CHA-KNMAT:NPI=UNKNOWN,LEVEL=0,ONNOL=OWN,
DNNOL=CDR,NUMEXT=99;

CHANGE-GEFE:TYPPARAM=KNMATOUT,PARTY=PAYPTY;
```

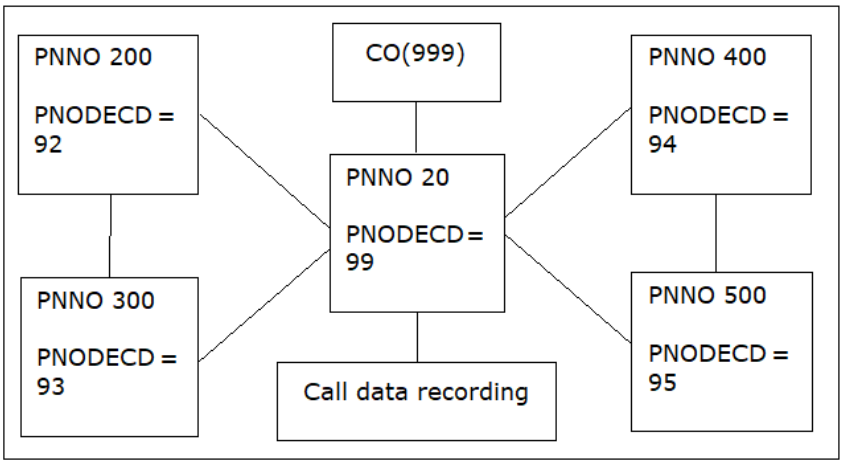


Figure 87: Example of network configuration with open numbering

2) The settings (supplements) in the node connection matrix, separated into connection type internal (KNMATINT), incoming (KNMATINC), or outgoing (KNMATOUT), do not affect call data recording until, for example, you set the CALLING party for outgoing connections:
```
CHA-GEFE:TYPPARAM=KNMATOUT,PARTY=CALLIPTY;
```
If you want to configure station number cutoff instead of add-on (only PARTY=CALLEPTY and PARTY=CONNPTY) and the node IDs contain two digits, you can also do this without KNMAT with the AMO GEFE:
```
CHA-GEFE:TYPPARAM=DN,DNSHORT=Y;
```
3) Configure the units or amounts with:

Amounts on device:
```
CHA-ZAND:TYPE=CCD,CDDISPEX=AMOUNT;
```
or

Units on device:
```
CHA-ZAND:TYPE=CCD,CDDISPEX=UNIT,CCUC=50;
(units on device)
```
If you want to show units on the display, these are calculated with CCUC from the amounts used in call data recording and shown rounded off to whole numbers.

4) Configure the attendant console display with:

two-line call charge display format (more than six digits for station and node numbers)
```
CHA-ZAND:TYPE=CCD,CDDISPAT=2;
```
or

One-line call charge display format (six digits for station number)
```
CHA-ZAND:TYPE=CCD,CDDISPAT=1;
```
5) Configure the timer for updating the call charge display on the device with:
```
CHA-CTIME:TYPESWU=CP1,DISPCH=30,CDRDISDE=10;
```
In this case, the charges are updated on the display every 30 seconds. The display is deleted 10 seconds after the call has ended.

IMPORTANT: Section 68.2, "Central System Data": These settings are valid for **all** of a network node's devices.

7.8.3 Tariff Group Tables

The tariff group tables contain the tariff table numbers per carrier, per station category, and per service. This applies to connections with and without call charge information.

IMPORTANT: Only tarif group table 0 is used for call charge display during a call.

Carrier	CATPTY	Service		
		Voice	Fax	DTE
0	NORM			
	SCRSPC			
	PUPHON			
	MTEQ			
...				
9	NORM			
	SCRSPC			
	PUPHON			
	MTEQ			

When adding tariff group tables, enter the number of the tariff table per carrier, category, and service.

7.8.4 Tariff Tables

IMPORTANT: The examples use the old European currencies ATS, DEM, and LIRE.

Tariff tables with call charge information

The tariffs for connections with call charge information are divided into graduated tariff ranges, with each graduated tariff range representing a call charge unit limit up to which the relevant tariff is valid. Each of these tariff tables contains four graduated tariff ranges, a minimum charge, and a multiplication factor for amounts (expressed as a per-mill value). The prices should be expressed in 1/100ths or 1/1000ths of the currency units[16]The information is expressed in 1/1000ths of the currency unit if 2T or 3T is set up in the COMPOS (decimal point position) parameter in the AMO DAVF; otherwise, it is expressed in 1/100ths.

LIMIT_1	PRICE_1
LIMIT_2	PRICE_2
LIMIT_3	PRICE_3
LIMIT_4	PRICE_4
MIN_CHRG	
CHRG_FACTOR	

16 For an explanation of currency units, see the display characteristics.

If the parameter METHOD = FACTOR is set in a tariff table with call charge information (WCU) and if call charge information is supplied by the network in the form of (finished) amounts, the amounts are multiplied by the FACTOR value. The minimum charge is taken into consideration, but there is no basic charge.

If the calculation is made based on time, the calculated amount is likewise modified by the multiplication factor (FACTOR) from the WCU table with the same tariff table number as the WOCU table that is being used.

The costs calculated in this way are taken as the connection costs.

IMPORTANT: The minimum charge is always expressed in 1/100ths of the currency units, regardless of the DAVF setting.

Tariff tables without call charge information

For connections without call charge information, the tariffs are entered depending on the time of day and distance.

Zones/Set Value	Day		Night		Night		Night		Night		TABT No.	Chang Period	Min. Charg	Basic Charg	B-CHL Factor
NO_ENTRY/0															
INT 01-09/01-09	xx	yy	xx	yy	xx	yy	xx	yy	xx	yy	tt	cc	mm	bb	ff
INC 01-09/11-19															
LOCAL/21															
FREE/29															
CHINFO/30															
NEAR/31															
TOLL 01-50/51-100															
ABROAD 01-99/101-199															
TIE 01-09/201-209															

xx: Clock in 1/100ths of seconds

yy: Price for this clock in 1/100ths, 1/1000ths, or 1/100000ths of the currency units[17] (e.g., pennies, tenths of a penny or thousandths of a penny. It depends on the GEN (COMPOS) setting).

tt: Number of segmentation table (1-25)

17 For an explanation of currency units, see the display characteristics.

cc: Boolean value

(FALSE): The time-of-day segment for the start of the call applies during the entire connection, which means that if the segment changes, the change is ignored.

(TRUE): If the time-of-day segment changes, the call duration is split up, which means that the costs are evaluated according to the each applicable time-of-day segment.

mm: The minimum charge for a call, in hundredths of currency units.

bb: The basic charge of a connection, always in hundredths of currency units.

ff : Multiplication factor per B channel used (in percent, 100% means multiply by 1).

Five tariff ranges can be assigned to the various distance zones. The costs are calculated according to the particular applicable segment. A basic charge and a minimum charge can be specified.

In the tariff tables without charge information, you can specify the distance zone and the day, night1, night2, night3, and night4 tariffs (yy) per clock (xx) that apply to this zone. Specify the clock in 1/100 seconds, the day and night tariffs in 1/100ths, 1/1000ths or 1/100000ths of the currency units, depending on the settings in the GEN branch and the COMPOS parameter.

The basic charge (bb) can be either positive or negative. The negative charge facilitates calculating the first n seconds of the call duration at no charge (exemption). As long as the costs that accrue are negative, the display shows costs = 0.

The division of the call duration into time of day segments is done in the time of day segmentation tables. You must specify the number of the segmentation table (tt) that is to be used (see AMO TABT). The value for the segment change (cc) indicates whether or not a segment change during a call is taken into consideration.

When calculating costs, the call duration is divided into clocks based on the segment that applies at the beginning of the call and the current zone. The number of clocks in each segment determined in this way is multiplied by the current tariff (price), and then these values are added together. If there has been a change in the segment during the call, this is taken into account, depending on the value assigned for the segment change. After this, the basic charge is added on or deducted. If the calculated costs are greater than zero and less than the minimum charge, the minimum charge is taken as the cost of the connection.

Output format:

The calculated costs are output according to the selectable display characteristics in the AMO TBBL/branch GEN (associated with the respective tariff table).

The display characteristics are:

1) Decimal point position: indicates the position of the decimal point (-3 to 3, 2T, 3T 2HT and 3HT

Examples:

Decimal point position: 3		Value: 30558	Output: 305.580
Decimal point position: 2		Value: 30558	Output: 305.58
Decimal point position: 1		Value: 30558	Output: 305.6
Decimal point position: 0		Value: 30558	Output: 306
Decimal point position: -1		Value: 30558	Output: 3056
Decimal point position: -2		Value: 30558	Output: 30558
Decimal point position: -3		Value: 30558	Output: 30558
Decimal point position: 2T	(rounding)	Value: 30558	Output: 30.56
Decimal point position: 3T		Value: 30558	Output: 30,558
Decimal point position: 2HT	(rounding)	Value: 30558	Output: 0.31
Decimal point position: 3HT	(rounding)	Value: 30558	Output: 0,306

2) Currency identifier: Character string, for example, DEM, ATS, USD, etc.

Table with clock information

There are nine tariff tables with pulse time clocks available for setting the call charge pulses for analog stations that transmit call charge pulses or coin-operated phones.

Zone	DAY			NIGHT1			NIGHT2		
	Fix	First	Period	Fix	First	Period	Fix	First	Period
LOCAL	xx	yy	zz	xx	yy	zz	xx	yy	zz
NEAR									
TOLL01-50									
ABROAD1-99									
...									

Zone	DAY			NIGHT1			NIGHT2		
	Fix	First	Period	Fix	First	Period	Fix	First	Period
TIE01-09									

ZONE	NIGHT3			NIGHT4			SEGTBL	CHPER
	Fix	First	Period	Fix	First	Period		
LOCAL	xx	yy	zz	xx	yy	zz	tt	cc
NEAR								
TOLL01-50								
ABROAD1-99								
...								
TIE01-09								

xx: Basic charge: No or one or more call charge pulses are created as the basic charge and sent immediately. Pulses are not sent periodically (0-15).

yy: Time after which the first pulse is sent (in 10 ms):

- (0): No first call charge pulse is sent.
- (>0): A first charge pulse is sent after n * 10 ms (1-999999)
- (KA) Karlsson added method: The basic charge (xx) is automatically set to 1. A pulse is sent immediately. The next pulse is sent after a random period of time that lies within the configured time period (zz). The pulses are then sent periodically according to the set time period (zz).
- (KM) Karlsson modified method: The basic charge (xx) is automatically set to 1. A pulse is sent immediately. The next pulse occurs after a random time, which lies between the configured time period (zz) and this value doubled (2*zz). The pulses are then sent periodically according to the set time period (zz).
- (K) Karlsson method: The basic charge (xx) is automatically set to 0.
  The first pulse is sent after a random period of time which lies within the configured time period (zz). The pulses are then sent periodically according to the set time period (zz).

zz: Length of period for periodic pulses (in 10 ms).

tt: Number of the segmentation table.

cc: Identifier for time-of-day segment change for connections without call charge information

Boolean value: (FALSE): The time-of-day segment for the start of the call applies during the entire connection, which means that if the segment changes, the change is ignored.

(TRUE): If the segment changes, the call duration is split up, which means that the costs are evaluated according to the segment that applies in each case.

Calculation of costs

The calculation of the costs (with call charge information) is made in 1/100ths of currency units if the parameter COMPOS in the AMO DAVF is neither 2T nor 3T. The currency unit is the currency with the specified currency identifier. This setting corresponds to a decimal point position 2. For example, a calculated amount of 30558 corresponds to costs of 305.58 currency units.

If the decimal point position in the AMO DAVF is either 2T or 3T, the calculation is expressed in 1/1000ths of currency units. If the calculated costs total 30558, the display will show the amount 30.56 if COMPOS =2HT and 30.559 if COMPOS=3HT. This only applies if the calculation is made according to the WCU branch of the AMO TTBL.

Positive decimal point positions only influence the number of positions after the decimal point that are to be displayed, but not the value or amount. As a result, all tariff entries must be specified in 1/100ths of currency units if COMPOS is 0 to +3. If COMPOS is 2T or 3T, then entries must be expressed in 1/1000ths.

You can enter values in the range 0000 - 9999 for tariff information (TARMIN, TARIF1, etc.).

Negative decimal point positions indicate output without a decimal point and a shifting of the decimal point by 1 to 3 places to the right (this corresponds to division by 10 decimal point position). This means that if the decimal point position is -1, the value 30558 corresponds to the amount 305.58/10-1 = 3056, if the decimal point position is -2, to the amount 305.58/10-2 = 30558, etc.

When calculating by zone, the decimal point position is configured individually for the tariff table. the decimal point position is administered in the GEN branch in the same way as when using the AMO DAVF. If the decimal point position equals -3, -2, -1, 0, +1, +2 or +3, costs are calculated in 1/100ths of currency units. If the decimal point position is 2T or 3T, costs are calculated in 1/1000th of currency units, and if the decimal point position is 2HT or 3HT, costs are calculated in 1/100000ths of currency units.

The minimum charge (TARMIN) and the basic charge (TARBAS) continue to be expressed as 1/100ths of currency units.

IMPORTANT: The value of the decimal point position applies only to the assigned tariff table. If different tariff table numbers are specified for the display output (tariff group 1) and the data record (tariff group from the selection group), you must set the decimal point position for both tariff tables.

Example 1:

One call charge unit costs 12.1 pennies.

Input: TARIF = 0121 (00.121 DEM), decimal point position 3, currency identifier = 'DEM'. The COMPOS parameter in the AMO DAVF is 2T or 3T.

Example 2:

90 seconds' call duration at the day tariff costs 3.6 ATS.

Input: TARDAY = 0360 (03.60 ATS), INTDAY = 9000 (in 1/100ths of seconds), decimal point position 1 or 2, currency identifier = 'ATS'. The COMPOS parameter in AMO TTBL is +2.

Example 3:

One call charge unit costs 812 Lire. You must enter the parameter TARIF = 81200 (812.00 Lire). This is not possible because only four-digit values are allowed.

Solution: Decimal point position -1 is configured, then TARIF = 8120. This is 81.20 Lire, but the output is multiplied by 10 because of the negative decimal point position.

Example 4:

One call charge unit costs 1350 Lire. You must enter the parameter TARIF = 135000 (1350.00 Lire).

Solution: Decimal point position -2 is configured, then TARIF = 1350. This is 13.50 Lire, but the output is multiplied by 100 because of the negative decimal point position.

- Add a tariff group as follows:

```
ADD-TTBL:TBL=GRP,GROUPNO=0,CARRIER=0,SERVICE=VOICE,
TARTBLNO=1,CATPTY=NORM;

ADD-TTBL:TBL=GRP,GROUPNO=0,CARRIER=1,SERVICE=VOICE,
TARTBLNO=1,CATPTY=NORM;
```

- Create the tariff table with call charge information as follows: (no minimum charge, cost factor 100%, 1 charge unit should cost 50/100ths of the currency units).

```
ADD-TTBL:TBL=WCU,TARTBLNO=1,TARMIN=0,METHOD=FACTOR,
FACTOR=100,LT1=0,TARIF1=50;
```

- Add the tariff table without call charge information as follows:

```
ADD-TTBL:TBL=WOCU,TARTBLNO=1,ZONE=INT01,INTDAY=10,
TARDAY=100,INTNT1=10,NTAR1=100,INTNT2=10,NTAR2=100,
INTNT3=10,NTAR3=100,INTNT4=10,NTAR4=100,TARBAS=0,
TARMIN=0,SEGTBLNO=1,CHPER=Y;

ADD-TTBL:TBL=WOCU,TARTBLNO=1,ZONE=DIST01,INTDAY=10,
TARDAY=100,INTNT1=10,NTAR1=100,INTNT2=10,NTAR2=100,
INTNT3=10,NTAR3=100,INTNT4=10,NTAR4=100,TARBAS=0,
TARMIN=0,SEGTBLNO=1,CHPER=Y;

ADD-TTBL:TBL=WOCU,TARTBLNO=1,ZONE=INC01,INTDAY=10,
TARDAY=100,INTNT1=10,NTAR1=100,INTNT2=10,NTAR2=100,
INTNT3=10,NTAR3=100,INTNT4=10,NTAR4=100,TARBAS=0,
TARMIN=0,SEGTBLNO=1,CHPER=Y;
```

- Add the segmentation table (T=day tariff, N1 = night tariff 1, N2 = night tariff 2) as follows:

```
ADD-TABT:LT=06-00,TARTYPMO=NTAR2,TARTYPTU=NTAR2,
TARTYPWE=NTAR2,TARTYPTH=NTAR2,TARTYPFR=NTAR2,
TARTYPSA=NTAR2 ,TARTYPSU=NTAR2,SEGTBLNO=1;

ADD-TABT:LT=08-00,TARTYPMO=NTAR1,TARTYPTU=NTAR1,
TARTYPWE=NTAR1,TARTYPTH=NTAR1,TARTYPFR=NTAR1,
TARTYPSA=NTAR1,TARTYPSU=NTAR2;

ADD-TABT:LT=14-00,TARTYPMO=DTAR,TARTYPTU=DTAR,
```

```
TARTYPWE=DTAR ,TARTYPTH=DTAR,TARTYPFR=DTAR,
TARTYPSA=DTAR,TARTYPSU=NTAR2;

ADD-TABT:LT=18-00,TARTYPMO=DTAR,TARTYPTU=DTAR,
TARTYPWE=DTAR ,TARTYPTH=DTAR,TARTYPFR=DTAR,
TARTYPSA=NTAR2,TARTYPSU=NTAR2;

ADD-TABT:LT=22-00,TARTYPMO=NTAR1,TARTYPTU=NTAR1,
TARTYPWE=NTAR1,TARTYPTH=NTAR1,TARTYPFR=NTAR1,
TARTYPSA=NTAR2 ,TARTYPSU=NTAR2;

ADD-TABT:LT=24-00,TARTYPMO=NTAR2,TARTYPTU=NTAR2,
TARTYPWE=NTAR2,TARTYPTH=NTAR2,TARTYPFR=NTAR2,
TARTYPSA=NTAR2,TARTYPSU=NTAR2;
```

- Add the display characteristics for on the display and on the ATND as follows:

  with call charge information:

  ```
  CHANGE-DAVF:COMPOS=+2,NAME="DM";
  ```

  without call charge information:

  ```
  CHA-TTBL:TBL=GEN,ELEMENT=COMPOS,TARTBLNO=1,
  COMPOS=3HT;
  ```

7.8.5 Call Data Recording for Outgoing Connections

Call data recording for outgoing connections (trunk and tie traffic) is always configured using Least Cost Routing (LCR) parameters. The VOICE/FAX and DATA services are normally handled in the same way as far as charges are concerned. Because you can configure LCR separately depending on the service, you can also assign another cost parameter to each service.

Configuration commands:

1) Activate the feature for outgoing trunk calls (including charge display) as follows:

```
CHANGE-FEASU:TYPE=A,CM=CDROGTR&DISCHTR;
```

2) Activate the feature for outgoing tie traffic (including charge display) as follows:

```
CHANGE-FEASU:TYPE=A,CM=CDROGNW&DISCHNW;
```

3) Assign the LCR charge parameters as follows:

```
CHA-LDAT:LROUTE=<number>[,LSVC=VCE],
LRTEL=<number>,CARRIER=1,ZONE=LONG01,LATTR=WCHREG;
```

Explanation of important parameters:

CARRIER:	Network operator
ZONE:	Distance zone (EMPTY=no charges); you must configure the ZONE with the AMO TTBL

LATTR:	WCHREG activates call data recording for this routing element (see examples in Section 68.10, "Examples"). NOTRANS deactivates call data recording in all transit nodes in the route; only the charges reported by the CO are sent back to the source node (see example in Section 68.10.1, "Internal Call Data Recording in the Network"). EODSTCDR starts call data recording right after the end of dialing. INTCHARG treats outgoing tie connections as internal connections (see example in Section 68.10.1, "Internal Call Data Recording in the Network") NOCHDISP suppresses the call display in the source node if an "expensive" route is used on the way to the destination node (e.g., overflow into the CO) (see example in "Section 68.10.2, "Tie Traffic with Incoming Charges and Trunk Traffic in Transit""").

4) Define COT with the DPRE class of service and assign it to the trunk and tie circuits. DPRE causes the prefix digits to be added to the destination number that is sent to call data recording. This setting takes effect when an overflow trunk group is seized via a toll line.

If the network nodes have different ZAND settings for CDDISPEX (unit/charge), you must assign a COT with/without TRSC parameter to the trunk in the transit node (see example in Section 68.10.2, "Tie Traffic with Incoming Charges and Trunk Traffic in Transit").

If TRSC is set, charges are sent on this line in the direction of the source node; these can be displayed there, e.g. without ongoing call data recording. If TRSC is not set, then units are sent. This parameter works only in a connection's transit node.

```
CHA-COT:COTNO=15,COTTYPE=COTADD,PAR=DPRE;

CHA-COT:COTNO=15,COTTYPE=COTADD,PAR=TRSC;
(only in transit node)

CHA-TDCSU: PEN=<g-uu-bbb-sss>,COTNO=15;
```

5) Define the class of service (COS) with CDRSTN authorization and assign it to the stations at which the charges should be displayed. Assign the COS to the station with the AMOs ACSU, SCSU, SBCSU; you must also use the AMOs TACSU, TSCSU, TDCSU to assign it to a circuit whose protocol cannot transmit the classmarks.

```
CHA-COSSU:TYPE=COS,COS=5,AVCE=CDRSTN,AFAX=CDRSTN,
ADTE=CDRSTN;

CHA-SCSU:STNO=<number>,COS1=5,COS2=5;
```

Explanation of the following tables.

Table 48: In addition to the charges calculated in the separate node, it is also possible to receive call charge information from the line. Table 48 shows what affect the LCR parameters (AMO LDAT) have in this regard.

Table 49: If charges are received from the line, they are displayed according to this table. The charges were calculated in foreign nodes or they originate with the CO. The influence of activated call data recording is limited to a possible conversion of units into amounts or vice versa.

Table 50: If call data recording is activated and no charges are received from the line, the charges are calculated and displayed according to Table 50.

IMPORTANT: Calculated charges are not added to charges that were received from the line. Charges from the line are always dominant.

Table 47: Combination of LRTEL parameters and their effect (outgoing connections)

Combination of LRTEL parameters			Effect
ZONE	LATTR =WCHREG	LATTR =NOTRANS	
EMPTY	yes		No calculation of costs using cost parameters, costs are calculated based on call charge information over the line (trunk traffic). Conversion of pulses <-> charges is possible. Charges from the line:
		no	All types (trunk, tie) are possible.
		yes	Only trunk traffic from remote systems is possible.
not EMPTY	yes		Calculation of costs using cost parameters, calculation of costs based on charges via the line are dominant. Charges from the line:
		no	All types (trunk, tie) are possible.
		yes	Only trunk traffic from remote systems is possible.
any	no		No call data recording is activated, charges from the line can be displayed but not converted. Important: Note TRSC in the transit nodes. Charges from the line:
		no	All types (trunk, tie) are possible.
		yes	Only trunk traffic from remote systems is possible.

Table 48: AMO FEASU and AMO COSSU parameter (outgoing connections)

AMO FEASU		AMO COSSU	Meaning (Axxx=authorization for specific service)
CM= DISCHNW	CM= DISCHTR	Axxx = DIDB	
yes	any	yes	Charges displayed on the station display
any	yes		
any	any	no	No charges whatsoever displayed on the station display
no	no	any	

Table 49: AMO FEASU and AMO COSSU parameter (outgoing connections)

AMO FEASU				AMO COSSU	Meaning (Axxx=authorization for specific service)
CM = CDROGN	CM= CDROGTF	CM= DISCHNW	CM= DISCHTR	Axxx = DIDB	
yes	yes	yes	yes	yes	Trunk and networking call data is recorded for the station and all charges are displayed.
yes	no	yes	any	yes	Networking call data is recorded for the station and charges are displayed. No trunk charges.
no	yes	any	yes	yes	Trunk call data is recorded for the station and charges are displayed. No networking charges.
yes	yes	no	yes	yes	Trunk and networking call data is recorded for the station, only trunk charges are displayed.
yes	yes	yes	no	yes	Trunk and networking call data is recorded for the station, only networking charges are displayed.

AMO FEASU				AMO COSSU	Meaning (Axxx=authorization for specific service)
CM = CDROGN	CM= CDROGTF	CM= DISCHNW	CM= DISCHTR	Axxx = DIDB	
yes	yes	any	any	no	Trunk and networking charge data is recorded for the station, but no charges are displayed.
yes	no	any	any	no	Networking call data is recorded for the station, but not trunk call data; no charges are displayed.
no	yes	any	any	no	Trunk call data is recorded for the station but networking call data is not, and no charges are displayed.
no	no	any	any	any	Call data is not recorded for any station and no charges are displayed.

IMPORTANT: CDRSTN=no has the same effect as DISCHNW=no and DISCHTR=no and CDRSTN=any.

7.8.6 Call Data Recording for Incoming Connections

Cost parameters for incoming connections are assigned to the circuit (trunk) using the parameters CARRIER and ZONE in the AMOs TACSU, TDCSU, and TSCSU.

- CARRIER: Network operator
- ZONE: distance zone (INC01 to INC09, EMPTY); you must configure the ZONE with the AMO TTBL

Expand the circuit parameters (AMO COT) for incoming connections by four values relating to charges:

- ICZL: Incoming call data recording via the zone or the line
- ICZO: Incoming call data recording exclusively via the zone
- CATR: Transfer charges in the transit node. CATR works in the transit node if the incoming and outgoing circuits are analog circuits and charges should be passed on in transit. CATR is not a part of the INCDR feature; it was introduced for the China feature. With INCDR, charges are always transferred in transit for digital lines.
- TRSC: Line with amounts (instead of units). TRSC works when there are digital lines in transit. Because charges for incoming connections are not transferred in transit, TRSC is explained in Section 68.5, "Call Data Recording for Outgoing Connections".

IMPORTANT: Because of outgoing connection handover with call data recording in the remote system, the table for outgoing connections applies, in spite of the incoming seizure (see Table 51, Figure 92).

Table 50: AMO FEASU and AMO COSSU parameters (incoming connections)

AMO FEASU	AMO COSSU	Meaning
CM=DISCHNW	Axxx = CDRSTN	(Axxx=authorization for specific service)
yes	yes	Charges displayed on the station display
no	yes	No charges whatsoever displayed on the station display
any	no	

An incoming, transferred connection is shown in Figure 92: The original chargeable connection from node 1 to node 2 (e.g., CO) is transferred to a station in node 3, where it is an incoming connection. Nevertheless, the charge-related memory areas (COSTI buffers) must be created as with an outgoing connection. For this reason, you must set up DISCHNW (for the call detail memory) and CDRSTN (for the station) in node 3.

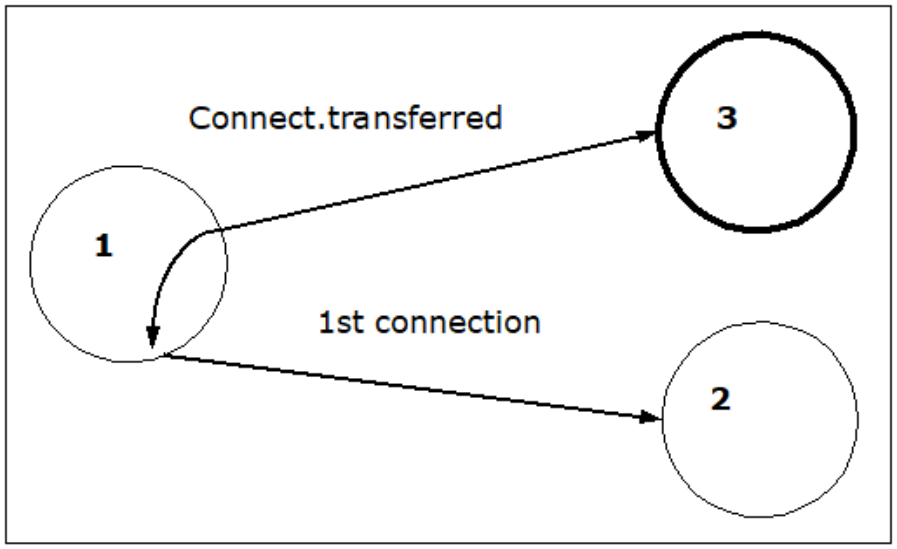


Figure 88: Example of an incoming transferred connection

Configuration commands:

1) Activate the feature for incoming trunk and tie traffic (including call charge display) as follows:

```
CHA-FEASU:TYPE=A,CM=CDRIC&DISCHTR&DISCHNW;
```

2) Set the COT parameter as follows:

```
CHA-COT:COTNO=15,COTTYPE=COTADD,PAR=ICZO;
```

3) Change the trunk configuration as follows:

```
CHA-TDCSU:PEN=<g-uu-bbb-sss>,COTNO=15,
CARRIER=1,ZONE=INC01;
```

Table 52 shows the effect of the COT parameters ICZL and ICZO in combination with the trunk AMO parameters CARRIER and ZONE.

4) Define the class of service (COS) with CDRSTN authorization and assign it to the stations at which the charges should be displayed. Assign the COS to the station with the AMOs ACSU, SCSU, SBCSU, but you must also assign it to a circuit whose protocol cannot transfer the classmarks with the AMOs TACSU, TSCSU, TDCSU.

```
CHA-COSSU:TYPE=COS,COS=5,AVCE=CDRSTN,AFAX=CDRSTN,
ADTE=CDRSTN;

CHA-SCSU:STNO=<number>,COS1=5,COS2=5;
```

Table 51: AMO TxCSU ans AMO COT parameters (incoming connections)

AMO TxCSU	AMO COT		Effect
ZONE	ICZL	ICZO	
not EMPTY	yes	no	Calculation of costs using cost parameters, calculation of costs based on call charge information via the line are dominant.
	no	yes	Calculation of costs using cost parameters (ZONE).
EMPTY	yes	no	No calculation of costs using cost parameters, but instead calculation of costs based on call charge information via the line.
	no	yes	Call detail recording without calculation of costs.

AMO TxCSU	AMO COT		Effect
ZONE	ICZL	ICZO	
any	no	no	No call data recording.

Table 53 shows how the AMO FEASU settings and the CDRSTN station authorization affect the call data recording.

Table 52: AMO FEASU and AMO COT parameters (incoming connections)

AMO FEASU			AMO COSSU	Meaning (Axxx=authorization for specific service)
CM=CDR	CM= DISCHN	CM= DISCHTR	Axxx =CDRSTI	
yes	yes	yes	yes	Trunk and networking call data is recorded for this station and all charges are displayed.
yes	no	yes	yes	Trunk and networking call data is recorded for this station and the trunk charges are displayed.
yes	yes	no	yes	Trunk and networking call data is recorded for this station and networking charges are displayed.
yes	any	any	no	Trunk and networking call data is recorded for this station but no charges are displayed.
yes	no	no	any	
no	any	any	any	Call data is not recorded for any station and no charges are displayed.

7.8.7 Call Data Recording for Internal Node Connections

Cost parameters are allocated to traffic restriction groups (ITR groups) for internal connections within the node. The AMO TRG is used to assign the cost parameter ZONE (INT01 to INT09) to the ITR groups and the cost parameter of the ITR group of the chargeable station (A station) is used for call detail recording. You must have added the ZONE with the AMO TTBL.

Configuration commands:

1) Activate the feature for internal traffic (including display of the charges) with:

```
CHANGE-FEASU:TYPE=A,CM=CDRINH&DISCHINH;
```

2) Define the class of service (COS) with CDRING and CDRSTN authorizations and allocate them to the stations with the station AMOs ACSU, SCSU, SBCSU.

```
CHA-COSSU:TYPE=COS,COS=5,AVCE=CDRINT&CDRSTN,
AFAX=CDRINT&CDRSTN,ADTE=CDRINT&CDRSTN;

CHA-SBCSU:STNO=<number>,COS1=5, COS2=5;
```

3) Assign the ZONE to the ITR groups as follows:

```
ADD-VBZGR:GROUP=0,TYPE=CHRGINT,ITRGRB=0,
ZONE=INT01;
```

4) Activate internal call data recording from the end-of-dialing as follows:

```
CHA-ZAND:TYPE=CCD,CDRRINGB=YES;
```

5) A dummy trunk group code (DDDDDD) is generated for the internal call data recording data record. This data record is output only if the parameter CDRCD in the AMO SELG is set to 0&&999999.

```
CHA-SELG:TBL=SELT,SELGNO=<number>,SELTABNO=<number>,
CDRCD=0&&999999;
```

6) To suppress call data recording advisories (F4066), set up a dummy LTG 99 in the AMO FBTN.

```
ADD-FBTN:TBL=TRKNO,LTG=99,LTU=1,SLOT=25,CCT=0,
BCHAN=<number>,VTRKNO=999999;
```

Costs are calculated depending on the FEASU settings and the CDRSTN authorizations. Table 54 shows the effect of the corresponding settings.

Table 53: AMO FEASU and AMO COT parameters (internal node connections)

AMO FEASU		AMO COSSU		AMO VBZGR	Meaning (Axxx=authorization for specific service)
CM= CDRINT	CM= DISCHIN	Axxx= CDRINT	Axxx = CDRST	ZONE	
yes	yes	yes	yes	not EMPTY	Call data is recorded for this station, charges are recorded and displayed.
yes	yes	yes	no	not EMPTY	Call data is recorded for this station, charges are recorded but not displayed at this station.
yes	no	yes	any	not EMPTY	Call data is recorded for this station, charges are recorded but not displayed at any station in the node.
yes	any	yes	any	EMPTY	Call data is recorded for this station, no charges are recorded or displayed.

AMO FEASU		AMO COSSU		AMO VBZGR	Meaning (Axxx=authorization for specific service)
CM= CDRINT	CM= DISCHIN	Axxx= CDRINT	Axxx = CDRST	ZONE	
yes	yes	no	any	any	No call data is recorded for this station, no charges are displayed.
no	any	any	any	any	Call data is not recorded for any station in the node, no charges are displayed.

7.8.8 Call Charge Display at the Attendant Console

After a call has ended, you can have the charges for the call displayed at the attendant console (ATND) for any station, with or without display (no in-progress charges).

To do this, you must have activated the feature centrally and the station must have CDRATN authorization.

This applies to all types of charges. The station can also have CDRSTN authorization, in which case the in-progress charges are displayed as described in the previous chapters.

Configuration commands:

1) The CDRATN feature (AMO FEASU) is always activated.

2) Define the class of service (COS) with CDRATN authorization and assign it to the stations for which the charges should be displayed at the attendant console as follows:

```
CHA-COSSU:TYPE=COS, COS=5,AVCE=CDRATN:

CHA-SCSU:STNO=<number>,COS1=5,COS2=5;
```

7.8.9 CDR Records, Central and per Station

Charges that have accumulated for a station can be reported to the charge output either centrally for each system or on a station-specific basis. This applies to all accumulated charges (incoming/outgoing, trunk/networking/ internal).

Configuration commands:

1) Charges reported per station to charge output:
`CHA-COSSU: TYPE=COS, COS=5,AVCE=CDRS;`

2) Charge output receives charges centrally for the system instead of on a station-specific basis:
`CHA-COSSU:TYPE=COS,COS=6, AVCE=CDRC;`

3) Assign COS to station numbers with one of the station AMOs:
`CHA-SCSU:STNO=<number1>,COS1=5;  (per station)`

```
CHA-SBCSU:STNO=<number2>,COS1=6;    (centrally)
```

7.8.10 Examples

7.8.10.1 Internal Call Data Recording in the Network

You can configure charges for internal traffic not only within a node, but also in a private network. The following example shows an entire network, which consists of 2 sub-networks (shown inside the dashed lines) for charging purposes. Internal charges are calculated inside these sub-networks. Networking charges for outgoing calls are calculated between the sub-networks, because, for example, the network connections (node 100 <-> node 400 and node 100 <-> node 300) are leased from a network operator.

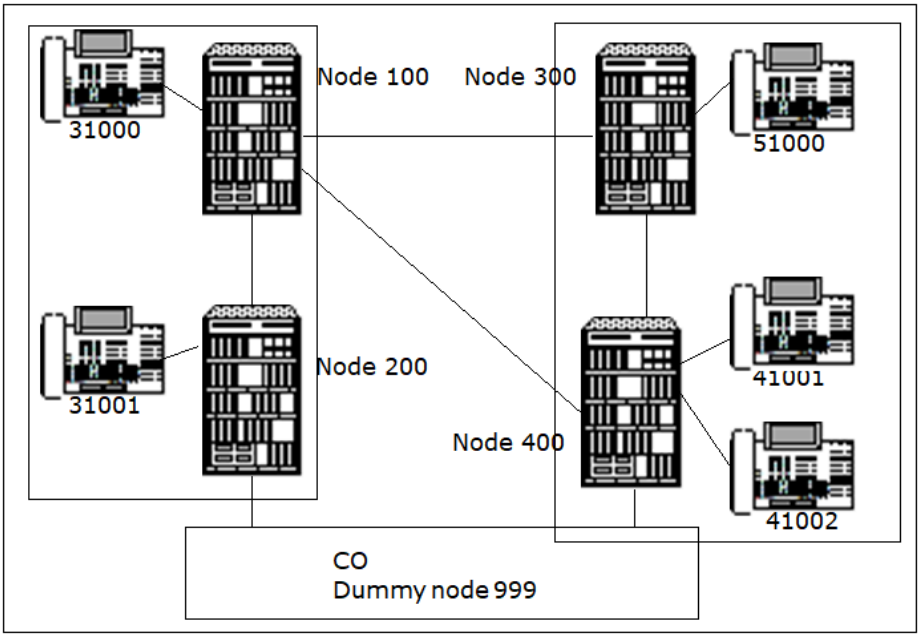


Figure 89: Charges for internal traffic and outgoing networking

Scenario 1: Station 41001 calls station 41002. 41001 is in an ITR group that is assigned the charge group INT01 (for example, EUR 0.30/MIN during the day, EUR 0.20 at night). 41001 sees the in-progress charges updated periodically on its display. After hanging up, the total charges for the call are displayed after a set time.

Scenario 2: Station 41002 calls station 51000. The outgoing trunk group is determined with LCR. Zone INT01 is again assigned to the LCR routing element. The INTCHARG identification is also set so that external charges are treated as internal ones. From the station's perspective, scenario 2 is the same as scenario 1.

Scenario 3: Station 41001 calls 31000. Because 31000 is not in the same sub-network and is reached via chargeable tie trunks, a networking zone (such as

TIE01) is assigned to the corresponding LCR routing element. The charges differ from those in scenarios 1 and 2.

Scenario 4: Station 31000 dials a CO number. If, for example, the tie trunk group nodes 100 - 200 and the first overflow trunk group nodes 100 - 400 are seized, a route node 100-300-400 is seized. No networking charges should be calculated in transit node 300 and source node 100. In this case, the corresponding route element in source node 100 is given the attribute NOTRANS and the message so that no call data recording is activated in transit node 300. Call data recording is always active in trunk breakout node 400. In the example, trunk access is only allowed for the LCR service VCE (voice + fax).

IMPORTANT:

All commands that are **shown in boldface** are specifically for call data recording.

Configuration commands in node 100:

1) Add a separate node number with:
```
CHA-ZAND:TYPE=ALLDATA,PNNO=100;
```

2) If necessary, increase the buffer for cost calculation with:
```
ADD-DIMSU:TYPE=BASIC,COSTI=1000;
```

3) Define amounts instead of units on the device with:
```
CHA-ZAND:TYPE=CCD,CDDISPEX=AMOUNT;
```

4) Configure the charge display timer with:
```
CHA-CTIME:TYPESWU=CP1,DISPCH=25,CDRDISDE=10;
```

5) Add the station numbers for closed numbering in the DPLN as follows:

```
ADD-WABE:CD=0,DPLN=0,DAR=CO;

ADD-WABE:CD=31000,DAR=STN;

ADD-WABE:CD=41001&41002,DAR=NETW,DESTNO=4;

ADD-WABE:CD=31001,DAR=NETW,DESTNO=2;

ADD-WABE:CD=51000,DAR=NETW,DESTNO=3;

ADD-WABE:CD=001&002&003, DAR=NETRTE;
```

6) Assign the zone for ITR 0 internal traffic as follows:

```
ADD-VBZGR:GROUP=0,TYPE=CHRGINT,ITRGRB=0,
ZONE=INT01;
```

7) Create the COS with the charge authorizations as follows:

```
CHA-COSSU:TYPE=COS,COS=2,AVCE=CDRINT&CDRSTN&CDRS,
AFAX=CDRINT&CDRSTN,ADTE=CDRINT&CDRSTN;
```

8) Add the LCR routes as follows:

```
CHA-COSSU:TYPE=LCOSV,LCOSV=15,ALAUTH=1&2;
(for example, LCOS authorization PBX-NETWORK + CO)

CHANGE-COSSU:TYPE=LCOSD,LCOSD=5,ALAUTH=1;
```

```
(for example, data only in PBX network)

ADD-BUEND:TGRP=20,NAME=K100TO200,NO=30;

ADD-BUEND:TGRP=30,NAME=K100TO300,NO=30;

ADD-BUEND:TGRP=40,NAME=K100TO400,NO=30;

ADD-TDCSU:OPT=NEW,COTNO=11,LCOSV=1,LCOSD=1,
DEV=S2CONN,PROTVAR=ECMA1,TGRP=20,BCGR=2;

ADD-TDCSU:OPT=NEW,COTNO=11,LCOSV=1,LCOSD=1,
DEV=S2CONN,PROTVAR=ECMA1,TGRP=30,BCGR=2;

ADD-TDCSU:OPT=NEW,COTNO=11,LCOSV=1,LCOSD=1,
DEV=S2CONN,PROTVAR=ECMA1,TGRP=40,BCGR=2;

ADD-RICHT:MODE=CD,CD=001,LRTE=55,CPS=0,
SVC=ALL,TGRP1=20,DESTNO=2,DNNO=200;

ADD-RICHT:MODE=CD,CD=002,LRTE=66,CPS=0,
SVC=ALL,TGRP1=30&40,DESTNO=3,DNNO=300;

ADD-RICHT:MODE=CD,CD=003,LRTE=77,CPS=0,
SVC=ALL,TGRP1=30&40,DESTNO=4,DNNO=400;

ADD-RICHT:MODE=LRTENEW,LRTE=88,LSVC=VCE,
TGRP=20&30&40,DNNO=999;

ADD-KNDEF:NNO=<level2>-<level1>-<level0>,
ISDNCC=49,ISDNAC=89,ISDNLC=722;
```

9) Configure the outdial rule for the CO (open numbering) as follows:

```
ADD-LODR:ODR=1,CMD=ECHO,FIELD=1;
(send the dialed 0)

ADD-LODR:ODR=1,CMD=ECHO,FIELD=2;
(send the rest of the station number)

ADD-LODR:ODR=1,CMD=END;
```

10) Assign the outdial rule for networking (closed numbering) as follows:

```
ADD-LODR:ODR=2,CMD=ECHO,FIELD=1;
(send the entire station number)

ADD-LODR:ODR=2,CMD=END;
```

11) Define the LCR elements with trunk group seizure order as follows:

```
ADD-LDAT:LROUTE=55,LSVC=ALL,LVAL=1,
TGRP=20,LAUTH=1,ODR=2;

ADD-LDAT:LROUTE=66,LSVC=ALL,LVAL=1,TGRP=30,
LAUTH=1,ODR=2;

ADD-LDAT:LROUTE=66,LSVC=ALL,LVAL=2,TGRP=40,
```

```
LAUTH=1,ODR=2;

ADD-LDAT:LROUTE=77,LSVC=ALL,LVAL=1,TGRP=40,
LAUTH=1,ODR=2;

ADD-LDAT:LROUTE=77,LSVC=ALL,LVAL=2,TGRP=30,
LAUTH=1,ODR=2;

ADD-LDAT:LROUTE=88,LSVC=VCE,LVAL=1,TGRP=20,
LAUTH=2,ODR=1;

ADD-LDAT:LROUTE=88,LSVC=VCE,LVAL=2,TGRP=40,
LAUTH=2,ODR=1;

ADD-LDAT:LROUTE=88,LSVC=VCE,LVAL=3,TGRP=30,
LAUTH=2,ODR=1;
```

12) Add the dialing plan for the CO:

```
ADD-LDPLN:LDP=0-Z,LROUTE=88,LAUTH=2;
```

13) Give the LCR elements charge attributes as follows:

```
CHA-LDAT:LROUTE=55,LSVC=ALL,LRTEL=1,
CARRIER=1,ZONE=INTERN01,LATTR=WCHREG&INTCHARG;

CHA-LDAT:LROUTE=66&77,LSVC=ALL,LRTEL=1&2,
CARRIER=1,ZONE=TIE01,LATTR=WCHREG;

CHA-LDAT:LROUTE=88,LSVC=VCE,LRTEL=1&2&3,
LATTR=WCHREG&NOTRANS;
```

14) Parameterize the stations as follows:

```
CHA-SBCSU:STNO=31000,COS1=2,COS2=2,LCOSV1=15,
LCOSV2=15,LCOSD1=5,LCOSD2=5,ITR=0;
```

15) Activate the features (charges for the trunk, tie, and internal) centrally as follows:

```
CHANGE-FEASU:TYPE=A,CM=CDROGTR&DISCHTR&
CDROGNW&DISCHNW&CDRINH&DISCHINH;
```

Configuration commands in node 400:

- Add a separate node number as follows:

  ```
  CHA-ZAND:TYPE=ALLDATA,PNNO=400;
  ```

- If necessary, increase the buffer for cost calculation with:

  ```
  ADD-DIMSU:TYPE=BASIC,COSTI=1000;
  ```

- Amounts instead of units at the device with:

  ```
  CHA-ZAND:TYPE=CCD,CDDISPEX=AMOUNT;
  ```

- Configure the charge display timer as follows:

  ```
  CHA-CTIME:TYPESWU=CP1,DISPCH=25,CDRDISDE=10;
  ```

- Add the station numbers in WABE as follows:

```
ADD-WABE:CD=0,DPLN=0,DAR=CO;

ADD-WABE:CD=41001&41002,DAR=STN;

ADD-WABE:CD=31000,DAR=NETW,DESTNO=1;

ADD-WABE:CD=31001,DAR=NETW,DESTNO=2;

ADD-WABE:CD=51000,DAR=NETW,DESTNO=3;

ADD-WABE:CD=001&002&003, DAR=NETRTE;
```

- Assign the zone for internal traffic in ITR 0 as follows:

```
ADD-VBZGR:GROUP=0,TYPE=CHRGINT,ITRGRB=0,
ZONE=INT01;
```

- Create the COS with the charge authorizations as follows:

```
CHA-COSSU:TYPE=COS,COS=2,AVCE=CDRINT&CDRSTN&CDRS,
AFAX=CDRINT&CDRSTN,ADTE=CDRINT&CDRSTN;
```

- Configure the COT with DPRE (for trunk circuits) as follows:

```
CHA-COT:COTNO=12,COTTYPE=COTADD,PAR=DPRE&LWNC&NLCR;
```

- Add the LCR routes as follows:

```
CHA-COSSU:TYPE=LCOSV,LCOSV=15,ALAUTH=1&2;
(for example, LCOS authorization PBX-Network + CO)

CHANGE-COSSU:TYPE=LCOSD,LCOSD=5,ALAUTH=1;
(for example, data only in PBX network)

ADD-BUEND:TGRP=11,NAME=K400TO100,NO=30;

ADD-BUEND:TGRP=31,NAME=K400TO300,NO=30;

ADD-BUEND:TGRP=44,NAME=K400TOAMT,NO=30;

ADD-TDCSU:OPT=NEW,COTNO=11,LCOSV=1,LCOSD=1,
DEV=S2CONN,PROTVAR=ECMA1,TGRP=11,BCGR=2;

ADD-TDCSU:OPT=NEW,COTNO=11,LCOSV=1,LCOSD=1,
DEV=S2CONN,PROTVAR=ECMA1,TGRP=31,BCGR=2;

ADD-TDCSU:OPT=NEW,COTNO=12,LCOSV=1,LCOSD=1,
GER=S2COD,PROTVAR=ETSI,TGRP=44,BCGR=2,NNO=999,
ISDNIP=00,ISDNNP=0;

ADD-RICHT:MODE=CD,CD=001,LRTE=55,CPS=0,
SVC=ALL,TGRP1=11&31,DESTNO=1,DNNO=100;

ADD-RICHT:MODE=CD,CD=002,LRTE=66,CPS=0,SVC=ALL,
TGRP1=11&31,DESTNO=2,DNNO=200;

ADD-RICHT:MODE=CD,CD=003,LRTE=77,CPS=0,
SVC=ALL,TGRP1=11&31,DESTNO=3,DNNO=300;
```

```
ADD-RICHT:MODE=LRTENEW,LRTE=88,LSVC=VCE,
TGRP=11&31&44,DNNO=999;

ADD-KNDEF:NNO=<level2>-<level1>-<level0>,
ISDNCC=49,ISDNAC=89,ISDNLC=722;
```

- Configure the outdial rule for the CO (via a tie trunk) as follows:

```
ADD-LODR:ODR=1,CMD=ECHO,FIELD=1;
(send the dialed 0)

ADD-LODR:ODR=1,CMD=ECHO,FIELD=2;
(send the rest of the station number)

ADD-LODR:ODR=1,CMD=END;
```

- Assign the outdial rule for networking (closed numbering) as follows:

```
ADD-LODR:ODR=2,CMD=ECHO,FIELD=1;
(send the entire station number)

ADD-LODR:ODR=2,CMD=END;
```

- Configure the outdial rule for the CO (direct connection) as follows:

```
ADD-LODR:ODR=3,CMD=ECHO,FIELD=2;
(send the station number without "0")

ADD-LODR:ODR=3,CMD=END;
```

- Define the LCR elements with trunk group seizure order as follows:

```
ADD-LDAT:LROUTE=55,LSVC=ALL,LVAL=1,TGRP=11,
LAUTH=1,ODR=2;

ADD-LDAT:LROUTE=55,LSVC=ALL,LVAL=1,TGRP=31,
LAUTH=1,ODR=2;

ADD-LDAT:LROUTE=66,LSVC=ALL,LVAL=1,TGRP=11,
LAUTH=1,ODR=2;

ADD-LDAT:LROUTE=66,LSVC=ALL,LVAL=2,TGRP=31,
LAUTH=1,ODR=2;

ADD-LDAT:LROUTE=77,LSVC=ALL,LVAL=1,TGRP=31,
LAUTH=1,ODR=2;

ADD-LDAT:LROUTE=77,LSVC=ALL,LVAL=2,TGRP=11,
LAUTH=1,ODR=2;

ADD-LDAT:LROUTE=88,LSVC=VCE,LVAL=1,TGRP=44,
LAUTH=2,ODR=3;

ADD-LDAT:LROUTE=88,LSVC=VCE,LVAL=2,TGRP=11,
LAUTH=2,ODR=1;

ADD-LDAT:LROUTE=88,LSVC=VCE,LVAL=3,TGRP=31,
LAUTH=2,ODR=1;
```

- Add the dialing plan for the CO:
  ADD-LDPLN:LDP=0-Z,LROUTE=88,LAUTH=2;
- Give the LCR elements charge attributes as follows:

```
CHA-LDAT:LROUTE=77,LSVC=ALL,LRTEL=1,CARRIER=1,
ZONE=INTERN01,LATTR=WCHREG&INTCHARG;

CHA-LDAT:LROUTE=77,LSVC=ALL,LRTEL=2,CARRIER=1,
ZONE=TIE02,LATTR=WCHREG&NOTRANS;
(transit node 100 without charge)

CHA-LDAT:LROUTE=55&66,LSVC=ALL,LRTEL=1&2,CARRIER=1
,ZONE=TIE01,LATTR=WCHREG;

CHA-LDAT:LROUTE=88,LSVC=VCE,LRTEL=1,LATTR=WCHREG;

CHA-LDAT:LROUTE=88,LSVC=VCE,LRTEL=2&3,
LATTR=WCHREGT&NOTRANS;
```

- Parametrize the stations as follows:

```
CHA-SBCSU:STNO=41001&&41002,COS1=2,COS2=2,
LCOSV1=15,LCOSV2=15,LCOSD1=5,LCOSD2=5,ITR=0;
```

- Proceed as follows to activate the feature centrally:

```
CHA-FEASU: TYPE=A,CM=CDROGTR&DISCHTR&
CDROGNW&DISCHNW&CDRINT&DISCHINH;
```

Configuration commands in nodes 200 and 300:

Configure node 200 (with trunk connection) in the same way as node 100, in principle, like nodes 400 and 300.

7.8.10.2 Tie Traffic with Incoming Charges and Trunk Traffic in Transit

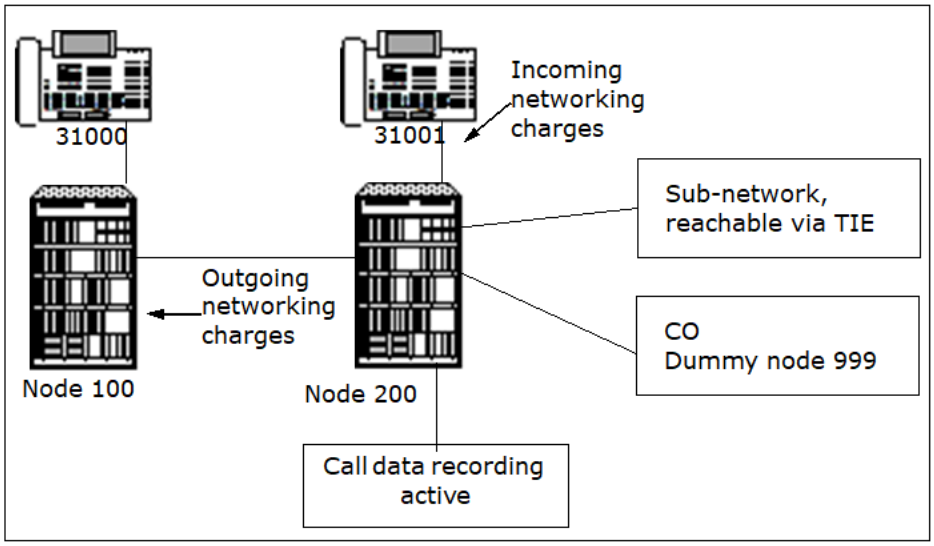


Figure 90: Tie Traffic with Incoming Charges and Trunk Traffic in Transit

Incoming charges should be recorded between the sub-network that is connected via tie trunks and node 200. In addition, call data recording for outgoing trunk traffic is activated in node 200.

Scenario 1: A station from the sub-network calls 31001. In node 200, call data recording is activated for incoming tie trunks and a zone is assigned to the incoming trunk so that charges are calculated by time; these charges should be displayed at the chargeable station 31001.

Scenario 2: Charges should be recorded for outgoing network connections from node 200 to node 100. A subscriber calls 722-31000. In node 200, a dummy station number is assigned to the trunk for call data recording; this is used as the "paying party" for the chargeable link 200-100.

Configuration commands in node 200:

- Assign a separate node identifier and separate node number as follows:
  ```
  CHA-ZAND:TYPE=ALLDATA,PNNO=200;
  ```
- Amounts instead of units on the device with:
  ```
  CHA-ZAND:TYPE=CCD,CDDISPEX=AMOUNT;
  ```
- If necessary, increase the buffer for calculation for costs with:
  ```
  ADD-DIMSU:TYPE=BASIC,COSTI=800;
  ```
- Configure the charge display timer as follows:
  ```
  CHA-CTIME:TYPESWU=CP1,DISPCH=25,CDRDISDE=10;
  ```
- Add the station numbers in WABE as follows:
  ```
  ADD-WABE:CD=0,DPLN=0,DAR=CO;

  ADD-WABE:CD=31001,DAR=STN;

  ADD-WABE:CD=31000,DAR=NETW,DESTNO=3;

  ADD-WABE:CD=001,DAR=NETRTE;
  ```
- Create the COS with the charge authorizations as follows:
  ```
  CHA-
  COSSU:TYPE=COS,COS=2,AVCE=CDRSTN,AFAX=CDRSTN,ADTE=CDRSTN;
  ```
- Add the LCR authorizations as follows:
  ```
  CHA-COSSU:TYPE=LCOSV,LCOSV=9,ALAUTH=1;

  CHA-COSSU:TYPE=LCOSD, LCOSD=5,ALAUTH=1;
  ```
- Add the outgoing trunk groups TIE and CO as follows:
  ```
  ADD-BUEND:TGRP=20,NAME=K200TONET,NO=30;

  ADD-BUEND:TGRP=30,NAME=K200TO100,NO=30;

  ADD-BUEND:TGRP=40,NAME=K200TOAMT,NO=30;
  ```
- Configure COT for incoming call data recording via ZONE as follows:
  ```
  CHA-COT:COTNO=15,COTTYPE=COTADD,PAR=ICZO;
  ```
- Configure COT for incoming call data recording via ZONE as follows:
  ```
  CHA-COT:COTNO=12,COTTYPE=COTADD,PAR=DPRE&LWNC&NLCR;
  ```
- Assign the charge parameters to the incoming circuit as follows:
  ```
  ADD-TDCSU:OPT=NEW,COTNO=15,LCOSV=1,LCOSD=1,DEV=S2CONN


  ,PROTVAR=ECMA1,TGRP=20,BCGR=2,CARRIER=2,ZONE=INC01;
  ```
- Add the trunk to node 100 as follows:
  ```
  ADD-
  ```

```
TDCSU:OPT=NEW,COTNO=11,LCOSV=1,LCOSD=1,DEV=S2CONN,PROTVAR=ECM
A1

           ,TGRP=30,BCGR=2;
```

- Add the trunk to the CO as follows:

```
ADD-
TDCSU:OPT=NEW,COTNO=12,LCOSV=1,LCOSD=1,GER=S2COD,PROTVAR=ETSI


,TGRP=40,BCGR=2,NNO=999,ISDNIP=00,ISDNNP=0,PEN=1113-0;
```

- Assign a "dummy" station number to the trunk circuit as follows:

```
ADD-
TLZO:TBL=MTLC,LTG=1,LTU=1,SLOT=113,CCR=0,BCHAN=0&&30,STNO=555
55;
```

- Configure the LCR routes for closed numbering as follows:

```
ADD-
RICHT:MODE=CD,CD=001,LRTE=55,CPS=0,SVC=ALL,TGRP1=30,DESTNO=3

           ,DNNO=100;

ADD-
RICHT:MODE=LRTENEW,LRTG=88,LSVC=ALL,TGRP=40,DNNO=999;
```

- Configure the outdial rule for direct trunk connection as follows:

```
ADD-LODR:ODR=1,CMD=ECHO,FIELD=2;  (send the station
 number without "0")

ADD-LODR:ODR=1,CMD=END;
```

- Assign the outdial rule for networking (closed numbering) as follows:

```
ADD-LODR:ODR=2,CMD=ECHO,FIELD=1;  (send the entire
 station number)

ADD-LODR:ODR=2,CMD=END;
```

- Define the LCR element with trunk group seizure order as follows:

```
ADD-
LDAT:LROUTE=55,LSVC=ALL,LVAL=1,TGRP=30,LAUTH=1,ODR=2;

ADD-
LDAT:LROUTE=88,LSVC=ALL,LVAL=1,TGRP=40,LAUTH=1,ODR=1;
```

- Configure the dialing plan for the CO as follows:

```
ADD-LDPLN:LDP=0-Z,LROUTE=88,LAUTH=1;
```

- Give the LCR element charge attributes (outgoing to node 100) as follows:

```
CHA-LDAT:LROUTE=55,LSVC=ALL,LRTEL=1,CARRIER=2,ZONE=TIE02

          ,LATTR=WCHREG;
```

- Configure the LCR element for the CO with outgoing call data recording as follows:

```
CHA-LDAT:LROUTE=88,LSVC=ALL,LRTEL=1,LATTR=WCHREG;
```

- Parameterize the stations as follows:

```
CHA-
SBCSU:STNO=31001,COS1=2,COS2=2,LCOSV1=9,LCOSV2=9,LCOSD1=9

           ,LCOSD2=9;
```

- Activate the feature centrally as follows (TIE incoming, TIE outgoing, CO outgoing):
  ```
  CHA-
  FEASU:TYPE=A,CM=CDROGTR&DISCHTR&CDROGNW&DISCHNW&CDRIC;
  ```

7.9 Charge Pulse Metering & Sending to Analog Stations

7.9.1 Feature description

12 or 16 kHz metering pulses are sent to analog stations with the classes of service "GET" and "Call charge metering pulse sending" or to coin boxes (new COS). The frequency of the metering pulses (depending on the time of day, type of day, zone, etc.) is either calculated by the OpenScape 4000 system (charge pulse metering) or received by a higher-ranking CO.

The OpenScape 4000 system supports the charge pulse types 16 kHz, 12 kHz, and line reversal.

A new SLMA board (SLMAR) was developed for sending the 12 kHz and 16 kHz pulses. The charge pulse types (16 KHz, 12 KHz, etc.) can be configured per port.

A special charge pulse is configured in the OpenScape 4000.

The pulse sending procedures listed below can be configured (see AMO GEFE / TTBL):

Fixed metering pulse sending at connection setup	One or more metering pulses are sent immediately as basic charges. Pulses are not sent periodically (interval set to 0).
Periodical metering pulse	One or more metering pulses are sent immediately. The pulses are then sent periodically according to the set intervals.
Periodical "Karlsson" (K) metering pulse	The first metering pulse is sent after a random period of time which lies within the configured interval range. The pulses are then sent periodically according to the set intervals. (Method 0)
Periodical "Karlsson added" (KA) metering pulse	The first metering pulse is sent immediately. The next metering pulse is sent after a random period of time which lies within the configured interval range. The pulses are then sent periodically according to the set intervals. (Method 1)
Periodical "Karlsson modified" (KM) metering pulse	The first metering pulse is sent immediately. The next metering pulse is sent after a random period of time which lies within a range of 2 times the configured interval. The pulses are then sent periodically according to the set intervals. (Method 2)

7.9.1.1 Operating limitations

Only the following stations are allowed to use this feature:

1) Analog stations with metering or

- ELASA coin boxes with the appropriate configuration (OpenScape 4000-specific EPROM specified for the country intended for use)

Simultaneous use of the features "Charge Pulse Metering" and "Extended Subscriber Loop" is not possible.

7.9.1.2 Areas of application

This feature is intended for "rural" markets (e.g. South America).

7.9.1.3 Activating the feature

This is not a default feature. Metering pulse sending is activated using the FEASU AMO's feature bit.

The start of CDR for internal connections at end-of-dialing can be configured using the AMO ZAND. In this case both pulse sending and CDR for all internal connections starts from the ringing state.

CDR from end-of-dialing (for internal calls) is independent from the configuration of metering pulse sending.

7.9.2 Service Information

7.9.2.1 Charges for analog stations

The features "extended loop" and "Send metering pulse" are mutually exclusive.

The level is set with the AMO SCSU and is dependent on the station and line length.

The maximum line length is currently 300 m (approx.).

Metering pulses from the CO are converted on a one-to-one basis by the SLMAR.

Call charge information generated by the remote system is split by the CCUC parameter in the AMO ZAND and then forwarded as pulses by the SLMAR.

Separate clock tables must be configured with the AMO TTBL for internal and network-wide CDR by carrier and zone. Only the clock tables of the TTBL group are used for timer pulse generation. Clock tables in other groups are not analyzed by the software.

7.9.2.2 Increasing the line length

Stations with a loop resistor of up to 3000 ohms (including station) can be connected to the SLMAR.

Up to two analog stations are permitted per port.

An extended station (extended loop) in talk state requires roughly the same amount of power as two normal analog stations.

The ringing ac current for the station is generated on the board. The ring current from the ring generator is not used.

The limit for the extended stations is the power supply of the system.

During configuration of the station the board checks if the increased power supply is necessary. If it is not required, a message indicating that a standard SLMA should be used is output.

When equipping the system, the configurator must ensure that there are no hot spots.

7.9.3 Generation Notes

7.9.3.1 AMOs for charges on analog stations

AMO	Parameter	Sprache	Beschreibung/ Discription
FEASU	LM=GIS	d	Gebührenimpulsaussendung und -messung (Baugruppe SLMAR)
	CM=CPS	e	Charge pulse sending and metering (SLMAR)
SCSU	GERKON= ANATEGEB	d	Analoges Sprachendgerät mit Gebührenzähler
	DVCFIG= ANATECM	e	Analog voice terminal with charge metering
	PULSTYP	d	Typ der Gebührenimpulse (nur Baugruppe SLMAR)
	PULSTYPE	e	Type of charge metering pulses (only for SLMAR board)
	PULSPGL	d	Pegel der Gebührenimpulse (nur Baugruppe SLMAR)
	PULSLEV	e	Level of charge metering pulses (only for SLMAR board)
TTBL	TAB=TKT	d	Tabelle mit Taktinformation
	TBL=CLK	e	Table with clock information

7.9.3.2 FEASU - Enabling metering pulse sending

```
CHA-FEASU:TYPE=A,CM=CPS;
```

7.9.3.3 BCSU - Configuring an SLMAR board

```
ADD-BCSU:TYPE=PER,LTG=1,LTU=2,SLOT=67,PARTNO=Q2480-X;
```

7.9.3.4 XAPX - Managing classes of service

```
ADD-
COSSU:NEWCOS=24,AVCE=TA&PUPHON&TNOTCR&CDRATN&CDRINT&CDRS&CDRC;
```

- PUPHON ... Public telephone

Different clock intervals can be sent for each station type according to the assigned class of service. If a station does not have a special class of service, it is treated as a "normal station".

7.9.3.5 SCSU - Configuring an SLMAR station

```
ADD-SCSU:STNO=2250,PEN=1-2-67-
0,DVCFIG=ANATECM,DPLN=0,ITR=0,COS1=24,COS2=24,LCOSV1=7,LCOSV2=6,
LCOSD1=5,LCOSD2=4,CIRCDIX=1,DIAL=VAR,PULSTYPE=KHZ12,PULSLEV=VEFF
5;
```

- DVCFIG ... Device configuration
  - ANATECM ... Analog station with metering
  - ANATE ... Analog telephone
- CIRCIDX ... Index for timer block table
- PULSTYPE ... Type of metering pulse
  - FORM ... Change pulse form
  - KHZ12 ... 12 kHz pulses
  - KHZ16 ... 16 kHz pulses
  - POL ... Polarity reversal
  - POL12 ... Polarity reversal + 12 KHz
  - POL16 ... Polarity reversal + 16 KHz
- PULSLEV ... Level of metering pulses
  - VEFF5 ... 5 volts effective voltage

  Given that each station has a different line length and a different frequency separating filter, the setting for the pulse level and the pulse silent period in PTIME must be chosen carefully.

  When setting the metering level and the pulse length and duration, it is recommended that you have a measuring device for measuring the metering pulses as well as a data sheet for the frequency separating filter.

7.9.3.6 TTBL- Configuring the tariff table for pulse sending

```
ADD-
TTBL:TBL=CLK,TARTBLNO=1,ZONE=DIST01,FIXDAY=1,FPLSDAY=100,PPLSDAY
=100,FIXN1=1,FPLSN1=100,PPLSN1=100,FIXN2=1,FPLSN2=100,PPLSN2=100
,FIXN3=1,FPLSN3=100,PPLSN43=100,PPLSN3=100,FIXN4=1,FPLSN3=100,PP
LSN4=100,SEGTBLNO=1,CHPER=Y;
```

The clock branch is only required if the value MIX or TIME is set in the AMO GEFE. If PULSE is set in GEFE, the pulse is normally sent from the CO to the SLMAR, which in turn generates the 16 KHz pulse for the station and sends it to the station.

- TBL ... New tariff table branch
  - CLK ... Table with clock information
- TARTBLNO ... Tariff table number
- ZONE ... Zone for connections without CDR information (parameter Zone)

  The table contains three parameters (FIX..., FPLS..., PPLS...), for each rate period. These parameters define the metering pulse sending (e.g 1,100,100). These parameters are interpreted as follows:
  - FIX ... Number of pulses to be sent as basic charges
  - FPLS ... Time until the first pulse after the basic pulses are sent in milliseconds

  This parameter can also contain one of the following values:

  K ..... for Karlsson metering pulse sending

  KA ... for Karlsson added metering pulse sending

  KM ... for Karlsson modified metering pulse sending
  - PPLS ... Silent period for periodical metering pulse sending in milliseconds

  If the selected metering pulse interval is too short (< 1 sec.), this can cause problems in some stations with regard to analysis of the 16 KHz signal.
- SEGTBLNO... Number of rate period table
- CHPER... Identifier for rate period change for connections without CDR information
  - Y... The costs are calculated according to the current rate period

7.9.3.7 TTBL - Managing the tariff group table

```
ADD-
TTBL:TBL=GRP,GROUPNO=0,CARRIER=0,CATPTY=PUPHON,SERVICE=ALL,TARTB
LNO=1;
```

7.9.3.8 VBZGR - Managing the internal traffic restriction group zone matrix

VBZGR is only required for internal and incoming CDR.

```
ADD-VBZGR:GROUP=3,TYPE=CHRGINT,ITRGRB=2,ZONE=INT01;
```

- CHRGINT... Matrix for internal connections
- CHRGINC... Matrix for incoming connections
- ITRGRB... Internal traffic restriction group

7.9.3.9 GEFE - Managing the CDR parameter

The METHOD branch is only used for the Rural feature.

There are three methods for this accounting of call charges procedure:

1) Method 0 ... No modification of the CDR information from the CO

- Method 1 ... First received pulse is suppressed
- Method 2 ... Second received pulse is suppressed

In the CAR branch the type of call detail recording is set per carrier. The following values are permitted:

- TIME ... The CO (carrier) does not transmit any CDR information; metering pulses are determined independently in the OpenScape 4000.
- PULSE ... The pulses received from the CO (carrier) are emitted by the OpenScape 4000 via the SLMAR board.
- MIX ... Pulses are calculated and emitted independently by the OpenScape 4000 at connection setup; if, however, pulses are received from the CO, these are sent via the SLMAR board.

7.9.3.10 ZAND - Managing central system data

```
CHA-ZAND:TYPE=CCD,CDRRINGB=YES;
```

- CDRRINGB ... Flag for active CDR with end-of-dialing

This option was developed with the Charge Pulse Metering and Sending feature, but is not a requirement for activation of metering pulse sending.

By activating internal CDR after end-of-dialing, recording for internal connections (and therefore also the start of metering pulse sending) is set to start at end-of-dialing (ringing state).

7.9.3.11 PTIME - Managing timers for peripherals

Changing the pulse duration or minimum pause duration between the metering pulses

```
CHA-
PTIME:TYPE=SLMA1,TBLK=0,PULSED=<number>,PAUSED=<number>;
```

- TBLK ... Timer block
- PULSED ... Pulse duration
- PAUSED ... Pause duration

The values for PULSED and PAUSED must be entered in 10 msec increments (i.e. for 80 msec the value is 8)

The timer block (TBLK) configured with the AMO PTIME must be assigned with the AMO SCSU in the CIRCIDX parameter (index for the timer block table for SLMAR):

1) `CHA-SCSU:STNO=<number>,CIRCIDX=0;`

If the original behavior for a station is to be restored, the value 16 must be specified for the CIRCIDX parameter when changing SCSU.

A change in the pulse or pause duration does not take effect until the SLMAR board is loaded.

7.9.4 Forwarding charges from the CO

7.9.4.1 Configuring the board

```
ADD-BCSU:MTYPE=PER,LTG=1,LTU=2,SLOT=31,PARTNO=Q2480-X;
```

- Configure the station on an SLMAR (the level depends on the line length and telephone type used)
- The station must be assigned a suitable PTIME table with CIRCIDX if required.

```
CHA-PTIME:TYPE=SLMA1,TBLK=0,PULSED=80, PAUSED=80;

H500: AMO PTIME STARTED

H01: WARNING!      THE MODIFIED TIME PARAMETERS WERE
 NOT

LOADED IN THE TRUNK MODULES.

PLEASE REMOVE AND INSERT AFFECTED BOARDS.
 ADD-
SCSU:STNO=7104,DVCFIG=ANATECM,DPLN=0,ITR=0,COS1=4,COS2=4,LCOS
V1=4,LCOSV2=4,LCOSD1=4,LCOSD2=4,CIRCIDX=1,DIAL=VAR,INS=YES,PU
LSTYPE=KHZ16,PULSLEV=VEFF3;
```

7.9.4.2 Feature enabled

The feature must be enabled in FEASU.

```
CHA-FEASU:TYPE=A,CM=CPS;
 ACT-BSSU:ONTYPE=AUL,LTG=1,LTU=2,SLOT=31;
```

7.9.4.3 Output loadware version of SLMAR

The loadware version of the SLMAR can be output with STA-LIST.

```
STA-LIST:FILENAM=":PDS:APSP/LTG/LG80/PZESLAR0",FORMAT=B;
```

7.9.4.4 Activating call detail recording

Activating call detail recording for the carrier used:

```
CHA-GEFE:TYPPARAM=CAR,CARRIER=1,TYPE=MIX,CHRGPLS=N;
```

7.9.4.5 PUPHON tariff table

Assigning tariff table for PUPHON:

```
ADD-
TTBL:TBL=GRP,GROUPNO=0,CARRIER=1,CATPTY=PUPHON,SERVICE=ALL,TARTB
LNO=1;
```

7.9.4.6 Station entries

All stations entered in your COS PUPHON are thus referred to TARTBLNO=1.

7.9.5 Configuring internal call detail recording

7.9.5.1 Configuring internal zones for call detail recording

```
ADD-VBZGR:GROUP=0&&15,TYPE=CHRGINT,ITRGRB=0&&15,ZONE=INT01;
```

7.9.5.2 Assigning type public telephone

```
ADD-COS:COPYCOS=3,NEWCOS=25,AVCE=PUPHON;
```

7.9.5.3 Enabling internal call detail recording

```
CHA-FEASU:TYPE=A,CM=CHRGINT;
```

7.9.5.4 Tariff table for metering pulse sending

Configuring the tariff table for metering pulse sending

```
ADD-
TTBL:TBL=CLK,TARTBLNO=1,ZONE=INT01,FIXDAY=2,FPLSDAY=100,PPLSDAY=
100,FIXN1=2,FPLSN1=100,PPLSN1=200,FIXN2=2,FPLSN2=100,PPLSN2=200,
FIXN3=2,FPLSN3=100,PPLSN3=300,FIXN4=2,FPLSN4=100,PPLSN4=500,SEGT
BLNO=1,CHPER=Y;
```

7.9.5.5 Tariff tables for public telephone

Configuring tariff tables for public telephone:

```
ADD-
```

```
TTBL:TBL=GRP,GROUPNO=0,CARRIER=0,CATPTY=PUPHON,SERVICE=ALL,TARTB
LNO=1;
```

7.10 Default Values

The customer can change these values, but they are preset to a particular value.

7.10.1 Country-Specific Parameters

- Change the parameter values

  DN branch Destination number shortened:

  CHA-GEFE:TYPPARAM=DN,DNSHORT=<param>;

  ATTNDINC branch Incoming attendant/secretary must pay own costs:

  CHA-GEFE:TYPPARAM=ATTNDINC,ATTNDINC=<param>;

  ATTNDOUT branch Outgoing attendant/secretary must pay own costs:

  CHA-GEFE:TYPPARAM=ATTNDOUT,ATTNDOUT=<param>;

  INCOLD branch Incoming caller in the field of the called:

  CHA-GEFE:TYPPARAM=INCOLD,INCOLD=<param>;

  CONFAOCS branch Configuration of the call charging over AOC_S message (call charge information at connection setup):

  CHA-GEFE:TYPPARAM=CONFAOCS,CONFAOCS=THRCONN,THRCONN=<param>;

  and

  CHA-GEFE:TYPPARAM=CONFAOCS,CONFAOCS=NTHRCONN,NTHRCONN=<param>;

  KNMATINT branch Node ID for internal traffic:

  CHA-GEFE:TYPPARAM=KNMATINT,PARTY=<param>;

  KNMATINC branch Node ID for incoming traffic:

  CHA-GEFE:TYPPARAM=KNMATINC,PARTY=<param>;

  KNMATOUT branch Node ID for outgoing traffic:

  CHA-GEFE:TYPPARAM=KNMATOUT,PARTY=<param>;

  PREINT branch Prefix handling for internal traffic:

  CHA-GEFE:TYPPARAM=PREINT,PARTY=<param>;

  PREINC branch Prefix handling for incoming traffic:

  CHA-GEFE:TYPPARAM=PREINC,PARTY=<param>;

  PREOUT branch Prefix handling for outgoing traffic:

  CHA-GEFE:TYPPARAM=PREOUT,PARTY=<param>;

  CAR branch Carrier:

  CHA-GEFE:TYPPARAM=CAR,CARRIER=<number>, {(min1)TYPE=<param> ,CHRGPLS=<param>};

  METHOD branch Method (Rural):

  CHA-GEFE:TYPPARAM=METHOD,CARRIER=<number>, {(min1)MNORM=<param> ,MSCRSPC=<param>,MPUPHON=<param>,MMTEQ=<pa

  REALUNIT branch Units from CO are saved in CDB:

  CHA-GEFE:TYPPARAM=REALUNIT,REALUNIT=<param>;

  SAMEPP branch Section by same paying party:

CHA-GEFE:TYPPARAM=SAMEPP,TICKET=<param>;

CCALLDIR branch Allow change of call direction in ticket sequence:

CHA-GEFE:TYPPARAM=CCALLDIR,CCALLDIR=<param>;

RNGDT branch New ringing, through connected call in RING_DUR:

CHA-GEFE:TYPPARAM=RNGDT,RNGDT=<param>;

QUEUEDUR branch Output of QUEUE_DUR without CDRE feature switched on:

CHA-GEFE:TYPPARAM=QUEUEDUR,QUEUEDUR=<param>;

- Display the parameter values
  `DIS-GEFE;`

7.10.2 Connection Limits Table

- Change a connection limit or a connection time limit or an amount limit or a fixed time of day

  RCD branch Routing code:

  CHA-GRZW:TBL=RCD,[CDRCODE=<number>],[LTTYPE=CHRG], [CDRULT=<number>]; CHA-GRZW:TBL=RCD,[CDRCODE=<number>], [LTTYPE=AMOUNT],[AMOUNTLT=<number>]; CHA-GRZW:TBL=RCD, [CDRCODE=<number>],[LTTYPE=TIME],[CALLT=<number>];

  CAR branch Carrier:

  CHA-GRZW:TBL=CAR,CARRIER=<number>,[LTTYPE=CHRG], [CDRULT=<number>]; CHA-GRZW:TBL=CAR,CARRIER=<number>, [LTTYPE=AMOUNT],[AMOUNTLT=<number>]; CHA-GRZW:TBL=CAR,CARRIER=<number>,[LTTYPE=TIME], [CALLT=<number>];

  HOUR branch Hour limit:

  CHA-GRZW:TBL=HOUR,[HOURLIM=<number>];
- Display the limits in list format:
  `DIS-GRZW:[TBL=<param>];`

7.10.3 Output Text Tables

- Add the output tables:
  `ADD-TEXT:TBL=OUTDAYC,ENTRY=<number>,NAME=<string>;`

  `ADD-TEXT:TBL=OUTMONC,ENTRY=<number>,NAME=<string>;`

  `ADD-TEXT:TBL=SERVICE,ENTRY=<param>,NAME=<string>;`

  `ADD-TEXT:TBL=SPEED,ENTRY=<number>,NAME=<string>;`

  `ADD-TEXT:TBL=NETTYPE,ENTRY=<param>,NAME=<string>;`

  `ADD-TEXT:TBL=SWP,ENTRY=<param>,NAME=<string>;`

```
ADD-TEXT:TBL=CHOFCON,ENTRY=<number>,NAME=<string>;

ADD-TEXT:TBL=SUBSID,ENTRY=<number>,NAME=<string>;

ADD-TEXT:TBL=SIGDATA,ENTRY=<number>,NAME=<string>;

ADD-TEXT:TBL=ROUTCC,ENTRY=<number>,NAME=<string>;

ADD-TEXT:TBL=IDPP,ENTRY=<param>,NAME=<string>;

ADD-TEXT:TBL=UNITERAS,ENTRY=<param>,NAME=<string>;

ADD-TEXT:TBL=LISTTYPE,ENTRY=<param>,NAME=<string>;

ADD-TEXT:TBL=EXPENS,ENTRY=<param>,NAME=<string>;

ADD-TEXT:TBL=CONNTYPE,ENTRY=<param>,NAME=<string>;

ADD-TEXT:TBL=SUPPLSERV,ENTRY=<param>,NAME=<string>;

ADD-TEXT:TBL=ZONE,ENTRY=<param>,NAME=<string>;

ADD-TEXT:TBL=CARRIER,ENTRY=<param>,NAME=<string>;

ADD-TEXT:TBL=COPIN,ENTRY=<param>,NAME=<string>;

ADD-TEXT:TBL=UNANS,ENTRY=<param>,NAME=<string>;

ADD-TEXT:TBL=RURAL,ENTRY=<param>,NAME=<string>;

ADD-TEXT:TBL=AOCTYPE,ENTRY=<param>,NAME=<string>;

ADD-TEXT:TBL=CALCTYPE,ENTRY=<param>,NAME=<string>;

ADD-TEXT:TBL=INFOTYPE,ENTRY=<param>,NAME=<string>;
```

- Delete an entire table or table entries:

```
DEL-TEXT:TBL=OUTDAYC,[ENTRY=<number>];

DEL-TEXT:TBL=OUTMONC,[ENTRY=<number>];

DEL-TEXT:TBL=SERVICE,[ENTRY=<param>];

DEL-TEXT:TBL=SPEED,[ENTRY=<number>];

DEL-TEXT:TBL=NETTYPE,[ENTRY=<param>];

DEL-TEXT:TBL=SWP,[ENTRY=<param>];

DEL-TEXT:TBL=CHOFCON,[ENTRY=<number>];

DEL-TEXT:TBL=SUBSID,[ENTRY=<number>];

DEL-TEXT:TBL=SIGDATA,[ENTRY=<number>];

DEL-TEXT:TBL=ROUTCC,[ENTRY=<number>];
```

```
DEL-TEXT:TBL=IDPP,[ENTRY=<param>];

DEL-TEXT:TBL=UNITERAS,[ENTRY=<param>];

DEL-TEXT:TBL=LISTTYPE,[ENTRY=<param>];

DEL-TEXT:TBL=EXPENS,[ENTRY=<param>];

DEL-TEXT:TBL=CONNTYPE,[ENTRY=<param>];

DEL-TEXT:TBL=SUPPLSERV,[ENTRY=<param>];

DEL-TEXT:TBL=ZONE,[ENTRY=<param>];

DEL-TEXT:TBL=CARRIER,[ENTRY=<param>];

DEL-TEXT:TBL=COPIN,[ENTRY=<param>];

DEL-TEXT:TBL=UNANS,[ENTRY=<param>];

DEL-TEXT:TBL=RURAL,[ENTRY=<param>];

DEL-TEXT:TBL=AOCTYPE,[ENTRY=<param>];

DEL-TEXT:TBL=CALCTYPE,[ENTRY=<param>];

DEL-TEXT:TBL=INFOTYPE,[ENTRY=<param>];
```

- Display one table or all tables:
  `DIS-TEXT:[TBL=<param>];`

7.10.4 File Sizes

- Add the file sizes for the CDRC files:

```
ADD-DAGR:FILE=CDRC1,NO=<number>;

ADD-DAGR:FILE=CDRC2,NO=<number>;
```

- Add the file parameters for the FT file:

```
ADD-DAGR:FILE=FT,NO=<number>,CODE=<string>,TIME=<number>

          ,PERIOD=<number>,NAME=<string>;
```

- Display the file sizes:
  `DIS-DAGR;`

7.11 DPS Interface Data

The call data recording software complex offers the OpenScape 4000 system operator a feature for retrieving call charge data or transmitting call charge data to a DPS application using a partner computer (DPS) application.

The message traffic and output of the call charge data to the DPS are processed via the Communication Management System (CMS).

- Connection process for retrieving data from the DPS: For this connection process, the DPS must send a job that specifies how much data should be transmitted.

  The DPS only sends the "Send call charge data" job at the beginning. Call data recording then responds with "Call charge data block on request" and waits for the answer "Call charge data processed" from the DPS. If this acknowledgement is not sent within a specified time, the logical connection is cleared down and the charge transmission is cancelled. If the DPS sends the acknowledge message, the next block of data is transmitted with "Call charge data processed" and a new call request. A "End of call charge data" message is sent when there is no more call charge data available.

  Requirement for processing the call charge data call:
- The AMO GEZAB's "ADD" action must be used to define a dialog field for the DPS retrieval of the CDRC1 or CDRC2 file.

  Example for multiple output = NO:

```
ADD-
GEZAB:TYPE=L,DIAFNO=<number>,FILE=CDRC1|
CDRC2,FILESTA=<string
>


,FILEND=<string>,DEV=DP,CALLUP=Y,DEL=<Y\N>,FORM=<string>


,FORM=<string>,BLKSIZE=<number>,FOUT=<Y\N>,MULTOUT=N

            ,PERIOD=<string>,SELSTOP=<Y\N>;
```

- For each dialog field that is assigned to the DPS call, a "short dialog" must be defined for the AMO GEZAB. In the "short dialog", it must be possible to change the two parameters FILESTA (start of file) and FILEND (end of file). If a scheduled job is activated for the dialog field that is assigned to the DPS call, the dialog field can only be rewritten by stopping the active scheduled job (STOP-GEZAB). This changes the status of the dialog field from TIMEORDER ACTIVE to BUSY. With the CHANGE-GEZAB action, the two parameters FILESTA and FILEND can be rewritten in the "short dialog".

A plausibility check is run on the data sent by the DPS application (file name, file start, file end), which means only the value CDRC1 or CDRC2 is allowed.

Call data recording for CDRC output on call must be configured:

1) `ADD-FEACG:CM=CDRCDIS;`

Furthermore, each of the eight dialog fields is searched to see if it contains the following parameters.

DEV	=	DPS
FILE	=	CDRC1 or CDRC
ORDER_ID	=	CALL

If a dialog field contains the above parameters, the dialog field on the database (DB) is blocked.

- Connection process for output from the OpenScape 4000: In the event of a file overflow (mandatory output) or output by scheduled jobs, the call

charge detail output is initiated by the OpenScape 4000 when the output device is specified (DPS in this case). This is done by sending the message "Call charge data blockon request". If the "Call charge data processed" acknowledge is sent, the process is continued in the same way as for DPS-based file retrieval.

If there is no acknowledgement from the DPS within a specific time, the call charge detail output is cancelled.

In contrast to call charge detail retrieval via DPS, the initiative for call charge detail output to the DPS lies with the OpenScape 4000.

All eight dialog fields are searched for the following parameters.

DEV	=	DPS
FILE	=	CDRC1 or CDRC
ORDER_ID	=	TO or FORCE

File processing starts if there is a dialog that contains these parameters. If no such dialog field is found (for example, if the job was cancelled with the AMO GEZAB before the DPS connection was set up), a report is sent to the exception handler and the system waits for the next job.

Meaning of the ORDER_ID variables:

- ORDER_ID = CALL There is a call from the DPS.
- ORDER_ID = TO Output to the DPS.
- ORDER_ID = FORCE Mandatory output to the DPS (for example, in the event of file overflow)

7.12 INFO 2000 Outcalls

- Set central parameters for call data recording
  `AD-FEACG:CM=<param>;`

Possible Values:	CDRATND	Charge registration on attendant console
	CDRCDUMP	Central call charge registration immediate
	CDRDIS	Central call charge registration on call-up
	CDRSPR	Station CDR with output on printer
	CDRFAST	Fast CDR output

- Assign selection groups and tables for output on attendant console

```
AD-
SELG:TBL=SELT,SELGNO=<number>,RESOP=N,BASDEV=ATTEND,RESDEV=NO
DEV,BLBAS=1,BLRES=0;
 AD-
SELG:TBL=SELT,SELGNO=<number>,SELTABNO=<number>,FORMBAS=ATTEN
D,FORMRES=NOFORM,TARIF=<string>,DESTCNT=<string>,CDRCD=<numbe
r>,

SERVICE=VOICE,ATNDGR=<number>,CTYPE=<string>,PAYPARTY=ALL,CDR
```

```
C=N,

CDRSTA=N,CHUAUTH=N,NSTAT=N,ABSCH=N,CDCHU=Y,CDRAC=STN,SFSETUP=
N,CDBAD=N,CDRULTE=N,CONNT=N,PCODE=Y,PPCF=N,TLNTAB=Y,STATAB2=N
,

DNOTBL1=N,DNOTBL2=N,CDRULT=0000,CONNTL=000000,CONNTL=000000,N
NO=0&&999,TIELINE=N;
```

The parameter TAR (tariff) defines the call charge unit output; possible values are NOCALC, TARGR00...TARGR05.

- Assign tariff group
  ```
  AD-
  TTBL:TBL=GRP,GRNO=<number>,CARRIER=<0-9>,SERVICE=<param>,

  TARTBLNO=<1-9>;
  ```
- Assign tariff
  ```
  AD-
  TTBL:TBL=WCU,TARTBLNO=<1-9>,TARMIN=<number>,METHOD=FACTOR,

  FACTOR=100,LT1=0,TAR1=<number>;
  ```
  <number> = call charge units in lowest-denomination currency unit
- Set comma (decimal point) and currency denomination for ATND display
  ```
  CHA-DAVF:COMPOS=<number>,NAME=<number>
  ```
- Assign the route code
  ```
  AD-RCUT:RTECD=<number>,CDRCODE=<number>;
  ```

  NOTICE: CDRCD parameter in SELG AMO is CDRCODE parameter in RCUT AMO.

  If the SELG parameters STATAB1, STATAB2, DNOTBL1 and DNOTBL2 are specified with "Y", the STN or destination concerned must be entered in the appropriate table with the SELL AMO (please note that the "station table" acronym in this AMO is "STNTBLx").
- Make entries in station or destination number lists
  ```
  AD-SELL:TBL=STNTBL1/2,STNO=<number>;
  ```
  or
  ```
  AD-SELL:TBL=DNOTBL1/2,STNO=<string>;
  ```

7.13 Per-Second Invoicing with Prices in 1/100000 Currency Units

Up until now, call charge unit prices have been specified in tariff tables with and without charge information in 1/100th or 1/1000th currency units.

This means cents or tenths of cents, for example, in the European Union.

These values were used to calculate prices per time unit. However, as these values did not support further subdivision, the full price had to be paid for each time unit that was started.

The charging method has now been updated to bill on the basis of 1/100000th currency units when calculating costs using tariff tables without charge information for the displays, attendant console display, and cost elements in the call detail record.

The output can now be rounded down to two and three places after the decimal point in whole currency units (EU: EUR), for example, for city calls (assumed price: 0.127 cent/s):

Call duration [seconds]:	1	25	60
2-digit display:	0.00 EUR	0.03 EUR	0.08 EUR
3-digit display:	0.001 EUR	0.032 EUR	0.076 EUR

The method for calculating costs on the basis of tariff tables with call charge units has not been changed.

The method for calculating costs on the basis of tariff tables with charge information in the form of costs has not been changed (the costs are received from the carrier "ready calculated").

- Administration:

  AMO-TTBL: In the GEN branch, a new parameter COMPOS is added for each tariff table without charge information with the values: -3 to 3, 2T, 3T, 2HT, 3HT. If the decimal place is not 2T, 3T, 2HT, or 3HT, the cost is calculated in 1/100th currency units. If the decimal place equals 2T or 3T, the cost is calculated in 1/1000th currency units, and if the decimal point equals 2HT or 3HT, the cost is calculated in 1/100000th currency units. Like the previous COMPOS parameter in the AMO DAVF, this COMPOS parameter indicates the value of the price information in this tariff table. **Attention:** The settings in the AMO-DAVF now only apply when the calculation uses the WCU tables. The settings in TTBL apply to a calculation using WOCU.
- Example 1 (CITY CALL) = basic setting:

  For carrier 0, zone INT01 is configured for per-second invoicing for the VOICE service and user category NORM. Tariff table 1 should be used for the display and tariff table 2 for CONN_CHARGE. In addition, time-of-day section table 1 should be used. The output should be rounded down to two places after the decimal point on the display, the attendant console, and in the data record.

  – Assign tariff group 0 to carrier 0 and enter tariff table 1

  ADD-
  TTBL:TBL=GRP,GROUPNO=0,CARRIER=0,CATPTY=NORM,SVC=VOICE,TARTBLNO=1;

  – Use tariff group 1 for calculating in the ADS and enter in tariff table 2

  ADD-
  TTBL:TBL=GRP,GROUPNO=1,CARRIER=0,CATPTY=NORM,SVC=VOICE,TARTBLNO=2;

  – Set the decimal point for tariff tables 1 and 2 to hundred-thousandths of the currency units and two-digit output

  CHANGE-
  TTBL:TBL=GEN,ELEMENT=COMPOS,TARTBLNO=1,COMPOS="2HT";
  CHANGE-
  TTBL:TBL=GEN,ELEMENT=COMPOS,TARTBLNO=2,COMPOS="2HT";

  – Tariff tables 1 and 2

  ADD-
  TTBL:TBL=WOCU,TARTBLNO=1,ZONE=INT01,INTDAY=100,TARDAY=127,INTNT1=100
  TARBAS=+0,TARMIN=0,SEGTBLNO=1,CHPER,BCHLFACT=0; ADD-

TTBL:TBL=WOCU,TARTBLNO=2,ZONE=INT01,INTDAY=100,TARDAY=127,INTNT1
TARBAS=+0,TARMIN=0,SEGTBLNO=1,CHPER,BCHLFACT=0;

– Use the AMO GEFE to set the carrier to charging by time.

CHANGE-
GEFE:TYPPARAM=CAR,CARRIER=0,TYPE=TIME,CHRGPLS=N;

– To calculate the units, you still need to configure a WCU table number 1 (in tariff group 0) with the price per unit of 0.94 EUR.

ADD-
TTBL:TBL=WCU,TARTBLNO=1,TARMIN=0,METHOD=FACTOR,FACTOR=1000 ,LT1

NOTICE: You should not configure WCU tariff table 2 with the UNITS method as otherwise the units calculated in the SWU can be calculated back into costs. This can result in considerable differences between DISPL_CHARGE and CONN_CHARGE.

– **Data records:**

RECNO:0022 STARTED AT 01-03-04/17:07 PAYPART : 3351
DESTINATION: 3352 CALL_ID : 00000022 CONN_TYP : INT CALLEV0 :
300 LEVEL0 : 300 CALLEV1 : 0 LEVEL1 : 0 CALLEV2 : 0 LEVEL2 :
0 CARRIER : CARRIER_0 ROUTE : DISC_CAUSE: 0 SUPL_SERV :
NORMAL PIN_TYP : 0 PIN_NO : CONN_DUR : 07:02.2 UNIT : 00001
CHARGE_ISP: 0.54 DISP_CHARG : 0.54 EXPENSIVE : B RING_DUR :
0000 ZONE : INTERN01 SWITCH_PR : ENDE N START_TIME: 17:07:01.5
END_TIME : 17:14:03.7 ATTNR : REC_PT : 2 TRANSIT_CNT: 0
RECORD-END

RECNO:0025 STARTED AT 01-03-04/17:23 PAYPART : 3350
DESTINATION: 2300 CALL_ID : 00000025 CONN_TYP : INT CALLEV0 :
300 LEVEL0 : 300 CALLEV1 : 0 LEVEL1 : 0 CALLEV2 : 0 LEVEL2 :
0 CARRIER : CARRIER_0 ROUTE : DISC_CAUSE: 0 SUPL_SERV :
NORMAL PIN_TYP : 0 PIN_NO : CONN_DUR : 11:27.2 UNIT : 00001
CHARGE_ISP: 0.87 DISP_CHARG : 0.87 EXPENSIVE : B RING_DUR :
0000 ZONE : INTERN01 SWITCH_PR : ENDE N START_TIME: 17:23:48.1
END_TIME : 17:35:15.3 ATTNR : REC_PT : 2 TRANSIT_CNT: 0
RECORD-END

- Example 2:

  If you want the display to show outputs with three places after the decimal point, enter the following command and perform the configuration outlined in Example 1.

  CHANGE-
  TTBL:TBL=GEN,ELEMENT=COMPOS,TARTBLNO=1,COMPOS="3HT";

  The output is still shown with two places after the decimal point on the attendant console and in the data record. The final sum appears as 0.124 on the display and as 0.12 on the AC, and the following is output as a data record:

  RECNO:0026 STARTED AT 01-03-04/17:38 PAYPART : 3350
  DESTINATION: 3361 CALL_ID : 00000026 CONN_TYP : INT CALLEV0 :
  300 LEVEL0 : 300 CALLEV1 : 0 LEVEL1 : 0 CALLEV2 : 0 LEVEL2 :
  0 CARRIER : CARRIER_0 ROUTE : DISC_CAUSE: 0 SUPL_SERV :
  NORMAL PIN_TYP : 0 PIN_NO : CONN_DUR : 01:37.2 UNIT : 00001

CHARGE_ISP: 0.12 DISP_CHARG : 0.12 EXPENSIVE : B RING_DUR : 0000 ZONE : INTERN01 SWITCH_PR : ENDE N START_TIME: 17:38:47.7 END_TIME : 17:40:24.9 ATTNR : REC_PT : 2 TRANSIT_CNT: 0 ***RECORD-END***

- Example 3:

  If you want two places after the decimal point to be shown on the display, but three on the attendant console, you only need the following command after the basic configuration outlined in Example 1:

  CHANGE-TTBL:TBL=GEN,ELEMENT=COMPOS,TARTBLNO=2,COMPOS="3HT";

  The output would then be 0.42 on the display and 0.415 on the attendant console; the data record would be:

  RECNO:0027 STARTED AT 01-03-04/17:49 PAYPART : 3350 DESTINATION: 2310 CALL_ID : 00000027 CONN_TYP : INT CALLEV0 : 300 LEVEL0 : 300 CALLEV1 : 0 LEVEL1 : 0 CALLEV2 : 0 LEVEL2 : 0 CARRIER : CARRIER_0 ROUTE : DISC_CAUSE: 0 SUPL_SERV : NORMAL PIN_TYP : 0 PIN_NO : CONN_DUR : 05:26.9 UNIT : 00001 CHARGE_ISP: 0.42 DISP_CHARG : 0.42 EXPENSIVE : B RING_DUR : 0000 ZONE : INTERN01 SWITCH_PR : ENDE N START_TIME: 17:49:20.9 END_TIME : 17:54:47.8 ATTNR : REC_PT : 2 TRANSIT_CNT: 0 ***RECORD-END***

- Example 4:

  If the customer would like to set a basic charge of 0.50 EUR, then the following commands must be entered after the basic configuration outlined in Example 1.

  CHANGE-TTBL:TBL=WOCU,TARTBLNO=1,ZONE=INT01,TARBAS="50";
  CHANGE-TTBL:TBL=WOCU,TARTBLNO=2,ZONE=INT01,TARBAS="50";

  The display and the attendant console show 1.51 EUR, and the data record is:

  RECNO:0028 STARTED AT 01-03-04/18:02 PAYPART : 3350 DESTINATION: 2300 CALL_ID : 00000028 CONN_TYP : INT CALLEV0 : 300 LEVEL0 : 300 CALLEV1 : 0 LEVEL1 : 0 CALLEV2 : 0 LEVEL2 : 0 CARRIER : CARRIER_0 ROUTE : DISC_CAUSE: 0 SUPL_SERV : NORMAL PIN_TYP : 0 PIN_NO : CONN_DUR : 13:16.5 UNIT : 00002 CHARGE_ISP: 1.51 DISP_CHARG : 1.51 EXPENSIVE : B RING_DUR : 0000 ZONE : INTERN01 SWITCH_PR : ENDE N START_TIME: 18:02:11.4 END_TIME : 18:15:27.9 ATTNR : REC_PT: 2 TRANSIT_CNT: 0 ***RECORD-END***

  Explanation: The connection time was 13 minutes and 16.5 seconds, so a total of 797 seconds was charged. 797 * 0.127 cents equals 1.0122 EUR, 0.5 EUR is added as the basic charge, and then the total is rounded down to two places after the decimal point.

- Example 5:

  The customer would like to set an exemption of 0.20 cents. In addition to the basic configuration shown in Example 1, you need the following commands:

  CHANGE-TTBL:TBL=WOCU,TARTBLNO=1,ZONE=INT01,TARBAS="-20";
  CHANGE-TTBL:TBL=WOCU,TARTBLNO=2,ZONE=INT01,TARBAS="-20";

  First data record: The credit of 0.20 cents is not used. Nothing is shown on the display, the attendant console shows 0.00, and the data record is:

  RECNO:0029 STARTED AT 01-03-04/18:22 PAYPART : 3350
  DESTINATION: 2300 CALL_ID : 00000029 CONN_TYP : INT CALLEV0 :
  300 LEVEL0 : 300 CALLEV1 : 0 LEVEL1 : 0 CALLEV2 : 0 LEVEL2 :
  0 CARRIER : CARRIER_0 ROUTE : DISC_CAUSE: 0 SUPL_SERV :
  NORMAL PIN_TYP : 0 PIN_NO : CONN_DUR : 00:42.4 UNIT : 00000
  CHARGE_ISP: 0.00 DISP_CHARG : 0.00 EXPENSIVE : B RING_DUR :
  0000 ZONE : INTERN01 SWITCH_PR : ENDE N START_TIME: 18:22:41.1
  END_TIME : 18:23:23.5 ATTNR : REC_PT : 2 TRANSIT_CNT: 0
  RECORD-END

  Explanation: After 42.4 seconds, 0.0546 EUR are charged, which is below the free limit of 0.20 EUR.

  Second data record: Credit is used up. The display and attendant console both show 1.47 and the data record appears as follows:

  RECNO:0031 STARTED AT 01-03-04/18:51 PAYPART : 3350
  DESTINATION: 2300 CALL_ID : 00000031 CONN_TYP : INT CALLEV0 :
  300 LEVEL0 : 300 CALLEV1 : 0 LEVEL1 : 0 CALLEV2 : 0 LEVEL2 :
  0 CARRIER : CARRIER_0 ROUTE : DISC_CAUSE: 0 SUPL_SERV :
  NORMAL PIN_TYP : 0 PIN_NO : CONN_DUR : 21:57.2 UNIT : 00002
  CHARGE_ISP: 1.47 DISP_CHARG : 1.47 EXPENSIVE : B RING_DUR :
  0000 ZONE : INTERN01 SWITCH_PR : ENDE N START_TIME: 18:51:22.5
  END_TIME : 19:13:19.7 ATTNR : REC_PT : 2 TRANSIT_CNT: 0
  RECORD-END

  Explanation: 1318 seconds costs 1.6739 EUR minus 0.20 EUR (free), so the result is 1.47 EUR.

- Example 6:

  The customer would like to set a minimum charge of 0.30 EUR. In addition to the basic configuration shown in Example 1, you need the following commands:

  CHANGE-
  TTBL:TBL=WOCU,TARTBLNO=1,ZONE=INT01,TARBAS="0",TARMIN=30;
  CHANGE-
  TTBL:TBL=WOCU,TARTBLNO=2,ZONE=INT01,TARBAS="0",TARMIN=30;

  First data record (very short connection):

  The display and attendant console show 0.30, and the following call detail record (CDR) is output:

  RECNO:0032 STARTED AT 01-03-04/19:19 PAYPART : 3350
  DESTINATION: 2310 CALL_ID : 00000032 CONN_TYP : INT CALLEV0 :
  300 LEVEL0 : 300 CALLEV1 : 0 LEVEL1 : 0 CALLEV2 : 0 LEVEL2 :
  0 CARRIER : CARRIER_0 ROUTE : DISC_CAUSE: 0 SUPL_SERV :
  NORMAL PIN_TYP : 0 PIN_NO : CONN_DUR : 00:03.0 UNIT : 00001
  CHARGE_ISP: 0.30 DISP_CHARG : 0.30 EXPENSIVE : B RING_DUR :

0000 ZONE : INTERN01 SWITCH_PR : ENDE N START_TIME: 19:19:21.9 END_TIME : 19:19:24.9 ATTNR : REC_PT : 2 TRANSIT_CNT: 0

Explanation: Only the minimum charge of 0.30 EUR is displayed.

Second data record (longer connection):

The display and attendant console show 0.37 EUR and the following call detail record (CDR) appears:

RECNO:0033 STARTED AT 01-03-04/19:21 PAYPART : 3350 DESTINATION: 2310 CALL_ID : 00000033 CONN_TYP : INT CALLEV0 : 300 LEVEL0 : 300 CALLEV1 : 0 LEVEL1 : 0 CALLEV2 : 0 LEVEL2 : 0 CARRIER : CARRIER_0 ROUTE : DISC_CAUSE: 0 SUPL_SERV : NORMAL PIN_TYP : 0 PIN_NO : CONN_DUR : 04:49.3 UNIT : 00001 CHARGE_ISP: 0.37 DISP_CHARG : 0.37 EXPENSIVE : B RING_DUR : 0000 ZONE : INTERN01 SWITCH_PR : ENDE N START_TIME: 19:21:03.9 END_TIME : 19:25:53.2 ATTNR : REC_PT : 2 TRANSIT_CNT: 0 ***RECORD-END***

Explanation: 290 seconds cost 0.3683 EUR which is rounded down to 0.37 (two places after the decimal point).

Output in the data record with more (maximum of five) places after the decimal point

Example: Per-second billing should be performed for carrier 0. Selection group 1 is active. Calls that are billed with charge information from the outside (carriers 1 to 9) should be output with two places after the decimal point, and calls that use per-second billing (carrier 0) should have five places after the decimal point.

Solution: Selection group 1 contains two selection tables. In the AMO DAVF, the decimal point is set to +2, and in the AMO TTBL, COMPOS is set to 2HT.

In the example, output is to DEV1, number 4 is assigned two-place format and number 8 is assigned five-place format.

1)
```
ADD-
SELG:TBL=SELG,SELGNO=1,RESOP=Y,BASDEV=DEV1,RESDEV=DEV3,BLBAS=
1,BLRES=1;

CHANGE-
SELG:TBL=SELT,SELGNO=1,SELTABNO=1,FORMBAS=FORM04,FORMRES=FORM
04,TARIF=TARGR01,

DESTCNT=A22;

CHANGE-
SELG:TBL=SELT,SELGNO=1,SELTABNO=1,CDRCD=0&&999999;

CHANGE-SELG:TBL=SELT,SELGNO=1,SELTABNO=1,SERVICE=VOICE;

CHANGE-SELG:TBL=SELT,SELGNO=1,SELTABNO=1,ATNDGR=0&&15;

CHANGE-
SELG:TBL=SELT,SELGNO=1,SELTABNO=1,CTYPE=ALL,PAYPARTY=ALL,CDRC
=N,CDRSTA=N,THRGCON=N,

NSTAT=N,SECTION=N,CDCHU=N,CDRAC=N,SFSETUP=N,CDBAD=N,CDRULTE=N
```

```
,CONNT=N,PCODE=N,PPCF=N,STATAB1=N,STATAB2=N,DNOTBL1=N,DNOTBL2
=N;

CHANGE-
SELG:TBL=SELT,SELGNO=1,SELTABNO=1,CDRULT=0,CONNTL=000000;

CHANGE-
SELG:TBL=SELT,SELGNO=1,SELTABNO=1,LEVEL0=0&&999,LEVEL1=0&&254
,LEVEL2=0&&30;

CHANGE-
SELG:TBL=SELT,SELGNO=1,SELTABNO=1,TIELINE=N,EXPENS=N,CONNTYP=
INTERN&INCO&OUTG,

COPIN=0&&7,CARRIER=1&&9;

CHANGE-
SELG:TBL=SELT,SELGNO=1,SELTABNO=2,FORMBAS=FORM08,FORMRES=FORM
08,TARIF=TARGR01,

DESTCNT=A22;

CHANGE-
SELG:TBL=SELT,SELGNO=1,SELTABNO=2,CDRCD=0&&999999;

CHANGE-SELG:TBL=SELT,SELGNO=1,SELTABNO=2,SERVICE=VOICE;

CHANGE-SELG:TBL=SELT,SELGNO=1,SELTABNO=2,ATNDGR=0&&15;

CHANGE-
SELG:TBL=SELT,SELGNO=1,SELTABNO=2,CTYPE=ALL,PAYPARTY=ALL,CDRC
=N,CDRSTA=N,

THRGCON=N,NSTAT=N,SECTION=N,CDCHU=N,CDRAC=N,SFSETUP=N,CDBAD=N
,CDRULTE=N,CONNT=N,PCODE=N,PPCF=N,STATAB1=N,STATAB2=N,DNOTBL1
=N,DNOTBL2=N;

CHANGE-
SELG:TBL=SELT,SELGNO=1,SELTABNO=2,CDRULT=0,CONNTL=000000;

CHANGE-
SELG:TBL=SELT,SELGNO=1,SELTABNO=2,LEVEL0=0&&999,LEVEL1=0&&254
,LEVEL2=0&&30;

CHANGE-
SELG:TBL=SELT,SELGNO=1,SELTABNO=2,TIELINE=N,EXPENS=N,CONNTYP=
INTERN&INCO&OUTG,

COPIN=0&&7,CARRIER=0;
```

Configuration data for format 4:

1)
```
ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=1,END=N

          ,FORMAT="RECNO:#@@@ STARTED AT #@-#@-#@/
#@:#@";
```

```
ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=2,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=3,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=4,END=N

          ,FORMAT="PAYPART   : #@@@@@@@@
 DESTINATION:
#@@@@@@@@@@@";

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=5,END=N,FORMAT="@@";

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=6,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=7,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=8,END=N

          ,FORMAT="CALL_ID   : #@@@@@@@     CONN_TYP
  :
#@@";

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=9,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=10,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=11,END=N

          ,FORMAT="CALLEV0   : #@@@         LEVEL0
  :
#@@@";

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=12,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=13,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=14,END=N

          ,FORMAT="CALLEV1   : #@@@         LEVEL1
  :
#@@@";

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=15,END=N,CTLCHARS=CR;
```

```
ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=16,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=17

          ,END=N,FORMAT="CALLEV2    : #@@@          LEVEL2

: #@@@";

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=18,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=19,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=20,END=N

          ,FORMAT="CARRIER    : #@@@@@@@@    ROUTE
  :
#@@@@@";

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=21,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=22,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=23,END=N

          ,FORMAT="DISC_CAUSE: #@@          SUPL_SERV
  :
#@@@@@@@@@";

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=24,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=25,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=26,END=N

          ,FORMAT="PIN_TYP    : #           PIN_NO
  :
#@@@@@@@@@@";

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=27,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=28,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=29,END=N

          ,FORMAT="CONN_DUR   : #@:#@.#      UNIT
  :
#@@@@";
```

```
ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=30,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=31,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=32,END=N

          ,FORMAT="CHARGE_ISP: #@@@@@@@
 DISP_CHARG :
#@@@@@@@";

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=33,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=34,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=35,END=N

          ,FORMAT="EXPENSIVE : #            RING_DUR
  :
#@@@";

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=36,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=37,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=38,END=N

          ,FORMAT="ZONE      : #@@@@@@@@@   SWITCH_PR
  :
#@@@@@";

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=39,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=40,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=41,END=N

          ,FORMAT="START_TIME: #@:#@:#@.#   END_TIME
  :
#@:#@:#@.# ";

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=42,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=43,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=44,END=N
```

```
          ,FORMAT="ATTNR     : #@@@@@@@@@@@@@@@
 REC_PT:
#@@@@@@@";

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=45,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=46,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=47,END=N

          ,FORMAT="TRANSIT_CNT: #@@@@@@@@@@";

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=48,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=49,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=4,TYPE=B,TBL=FORM,NO=50,END=N

          ,FORMAT="***RECORD-END***";

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=51,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=52,END=N,CTLCHARS=LF;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=53,END=N,CTLCHARS=LF;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=CTRL,NO=54,END=Y,CTLCHARS=LF;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=1,FLDNAME=RECNO,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=2,FLDNAME=STYEAR,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=3,FLDNAME=STMONTH,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=4,FLDNAME=STDAY,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;
```

```
ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=5,FLDNAME=STHOUR,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=6,FLDNAME=STMIN,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=7,FLDNAME=CHRGEE,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=8,FLDNAME=DESTPTY,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=9,FLDNAME=GLOBSEQ,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=10,FLDNAME=CONNTYPE,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=11,FLDNAME=GLOBLV0,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=12,FLDNAME=PPLV0,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=13,FLDNAME=GLOBLV1,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=14,FLDNAME=PPLV1,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=15,FLDNAME=GLOBLV2,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

```
ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=16,FLDNAME=PPLV2,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=17,FLDNAME=CARRIER,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=18,FLDNAME=ROUTCN,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=19,FLDNAME=CAUSE,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=20,FLDNAME=SUPLSERV,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=21,FLDNAME=COPIN,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=22,FLDNAME=PIN,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=23,FLDNAME=CONMIN,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=24,FLDNAME=CONSEC,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=25,FLDNAME=CON10,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=26,FLDNAME=CHRGUNIT,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;
```

```
ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=27,FLDNAME=CONCHRG,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=RC,COMPOS=6;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=28,FLDNAME=DISPCHRG,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=RC,COMPOS=6;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=29,FLDNAME=EXPENS,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=30,FLDNAME=RINGDUR,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=31,FLDNAME=ZONE,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=32,FLDNAME=SWP,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=33,FLDNAME=STHOUR,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=34,FLDNAME=STMIN,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=35,FLDNAME=STSEC,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=36,FLDNAME=ST10,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=37,FLDNAME=ENDHOUR,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;
```

```
ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=38,FLDNAME=ENDMIN,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=39,FLDNAME=ENDSEC,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=40,FLDNAME=END10,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=41,FLDNAME=TRNSFPTY,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=4,TYPE=B,TBL=FIELD,NOFELD=43,FLDNAME=TRANSCNT,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=R;
```

Configuration data for format 8:

1)
```
ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=1,END=N

          ,FORMAT="RECNO:#@@@ STARTED AT #@-#@-#@/
#@:#@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=2,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=3,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=4,END=N

          ,FORMAT="PAYPART   : #@@@@@@@@
 DESTINATION:
#@@@@@@@@@@@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=5,END=N,FORMAT="@@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=6,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=7,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=8,END=N
```

```
          ,FORMAT="CALL_ID   : #@@@@@@@     CONN_TYP
  :
#@@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=9,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=10,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=11

          ,END=N,FORMAT="CALLEV0   : #@@@          LEVEL0

: #@@@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=12,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=13,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=14,END=N

          ,FORMAT="CALLEV1   : #@@@          LEVEL1
  :
#@@@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=15,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=16,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=17,END=N

          ,FORMAT="CALLEV2   : #@@@          LEVEL2
  :
#@@@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=18,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=19,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=20

          ,END=N,FORMAT="CARRIER   : #@@@@@@@@    ROUTE

: #@@@@@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=21,END=N,CTLCHARS=CR;
```

```
ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=22,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=23,END=N

          ,FORMAT="DISC_CAUSE: #@@          SUPL_SERV
  :
#@@@@@@@@@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=24,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=25,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=26,END=N

          ,FORMAT="PIN_TYP   : #            PIN_NO
  :
#@@@@@@@@@@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=27,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=28,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=29,END=N

          ,FORMAT="CONN_DUR  : #@:#@.#      UNIT
  :
#@@@@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=30,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=31,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=32,END=N

          ,FORMAT="CHARGE_ISP: #@@@@@@@@@@
 DISP_CHARG :
#@@@@@@@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=33,END=N,FORMAT="@@@@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=34,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=35,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=36,END=N
```

```
          ,FORMAT="EXPENSIVE : #            RING_DUR
  :
#@@@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=37,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=38,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=39,END=N

          ,FORMAT="ZONE      : #@@@@@@@@@   SWITCH_PR
  :
#@@@@@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=40,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=41,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=42,END=N

          ,FORMAT="START_TIME: #@:#@:#@.#   END_TIME
  :
#@:#@:#@.# ";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=43,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=44,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=45,END=N

          ,FORMAT="ATTNR     : #@@@@@@@@@@@@@@@
 REC_PT:
#@@@@@@@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=46,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=47,END=N,CTLCHARS=LF;

ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=48,END=N

          ,FORMAT="TRANSIT_CNT: #@@@@@@@@@@";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=49,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=50,END=N,CTLCHARS=LF;
```

```
ADD-FTBL:FORMNO=8,TYPE=B,TBL=FORM,NO=51,END=N

          ,FORMAT="***RECORD-END***";

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=52,END=N,CTLCHARS=CR;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=53,END=N,CTLCHARS=LF;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=54,END=N,CTLCHARS=LF;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=CTRL,NO=55,END=Y,CTLCHARS=LF;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=1,FLDNAME=RECNO,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=2,FLDNAME=STYEAR,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=3,FLDNAME=STMONTH,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=4,FLDNAME=STDAY,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=5,FLDNAME=STHOUR,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=6,FLDNAME=STMIN,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=7,FLDNAME=CHRGEE,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=8,FLDNAME=DESTPTY,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;
```

```
ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=9,FLDNAME=GLOBSEQ,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=10,FLDNAME=CONNTYPE,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=11,FLDNAME=GLOBLV0,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=12,FLDNAME=PPLV0,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=13,FLDNAME=GLOBLV1,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=14,FLDNAME=PPLV1,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=15,FLDNAME=GLOBLV2,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=16,FLDNAME=PPLV2,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=17,FLDNAME=CARRIER,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=18,FLDNAME=ROUTCN,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=19,FLDNAME=CAUSE,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
```

```
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=20,FLDNAME=SUPLSERV,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=21,FLDNAME=COPIN,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=22,FLDNAME=PIN,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=23,FLDNAME=CONMIN,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=24,FLDNAME=CONSEC,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=25,FLDNAME=CON10,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=26,FLDNAME=CHRGUNIT,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=27,FLDNAME=CONCHRG,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=RC,COMPOS=7;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=28,FLDNAME=DISPCHRG,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=RC,COMPOS=7;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=29,FLDNAME=EXPENS,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=30,FLDNAME=RINGDUR,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=31,FLDNAME=ZONE,
```

```
FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=32,FLDNAME=SWP,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=33,FLDNAME=STHOUR,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=34,FLDNAME=STMIN,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=35,FLDNAME=STSEC,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=36,FLDNAME=ST10,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=37,FLDNAME=ENDHOUR,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=38,FLDNAME=ENDMIN,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=39,FLDNAME=ENDSEC,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=40,FLDNAME=END10,

FILLTYPE=CHAR,FILLER="0",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=41,FLDNAME=TRNSFPTY,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=L;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=42,FLDNAME=RECPT,
```

```
FILLTYPE=CHAR,FILLER=" ",FLDALIGN=R;

ADD-
FTBL:FORMNO=8,TYPE=B,TBL=FIELD,NOFELD=43,FLDNAME=TRANSCNT,

FILLTYPE=CHAR,FILLER=" ",FLDALIGN=R;
```

The configuration data listed at the beginning is used for the following examples.

RECNO:0005 STARTED AT 01-03-11/09:57 PAYPART : 3350 DESTINATION: 1503 CALL_ID : 00000006 CONN_TYP : OUTG CALLEV0 : 300 LEVEL0 : 300 CALLEV1 : 0 LEVEL1 : 0 CALLEV2 : 0 LEVEL2 : 0 CARRIER : CARRIER_1 ROUTE : 01 DISC_CAUSE: 16 SUPL_SERV : NORMAL PIN_TYP : 0 PIN_NO : CONN_DUR : 00:03.5 UNIT : 00001 CHARGE_ISP: 0.93 DISP_CHARG : 0.93 EXPENSIVE : B RING_DUR : 0017 ZONE : LONG01/DIST01 SWITCH_PR : ENDE N START_TIME: 09:57:12.9 END_TIME : 09:57:16.4 ATTNR : REC_PT : 2 TRANSIT_CNT: 0 ***RECORD-END***

Explanation: Trunk call, costs are sent from the central office; 0.93 appears on the display and on the attendant console.

RECNO:0006 STARTED AT 01-03-11/09:56 PAYPART : 3351 DESTINATION: 3352 CALL_ID : 00000005 CONN_TYP : INT CALLEV0 : 300 LEVEL0 : 300 CALLEV1 : 0 LEVEL1 : 0 CALLEV2 : 0 LEVEL2 : 0 CARRIER : CARRIER_0 ROUTE : DISC_CAUSE: 0 SUPL_SERV : NORMAL PIN_TYP : 0 PIN_NO : CONN_DUR : 02:56.3 UNIT : 00001 CHARGE_ISP: 0.22479 DISP_CHARG : 0.22479 EXPENSIVE : B RING_DUR : 0000 ZONE : INTERN01 SWITCH_PR : ENDE N START_TIME: 09:56:48.8 END_TIME : 09:59:45.1 ATTNR : REC_PT : 2 TRANSIT_CNT: 0 ***RECORD-END***

Explanation: Connection calculated to the second, 0.22 appears on the display and on the attendant console.

Example for output with four places after the decimal point:

RECNO:0007 STARTED AT 01-03-11/10:03 PAYPART : 3351 DESTINATION: 3352 CALL_ID : 00000007 CONN_TYP : INT CALLEV0 : 300 LEVEL0 : 300 CALLEV1 : 0 LEVEL1 : 0 CALLEV2 : 0 LEVEL2 : 0 CARRIER : CARRIER_0 ROUTE : DISC_CAUSE: 0 SUPL_SERV : NORMAL PIN_TYP : 0 PIN_NO : CONN_DUR : 03:58.7 UNIT : 00001 CHARGE_ISP: 0.3035 DISP_CHARG : 0.3035 EXPENSIVE : B RING_DUR : 0000 ZONE : INTERN01 SWITCH_PR : ENDE N START_TIME: 10:03:24.1 END_TIME : 10:07:22.8 ATTNR : REC_PT : 2 TRANSIT_CNT: 0 ***RECORD-END***

Explanation: Display and attendant console show 0.30.

NOTICE: A maximum of three places after the decimal point can be output on the display and attendant console but internal billing is more precise. The decimal point position in the AMO TTBL has no effect on billing with external charge information. As in the past, the AMO DAVF should be used to change this.

7.14 Station Number Modification

7.14.1 Feature Description

Many customers need the station numbers that appear on the charge tickets in a particular format. They consequently need an option for cutting off parts from or adding parts to the station numbers (for example, ISDN codes, tie line access digits, etc.).

These modifications are necessary for making efficient analyses. A suitable modification is critical for further ticket processing using applications.

Station number modification in call data recording affects only the number output in the charge tickets and so has absolutely no side-effects on the CP functionality.

An editable modification table can be used to configure digit patterns that can be cut off or added.

Multiple cutoff patterns and one add-on pattern can be defined for each node number. You can also configure the numbers to which these patterns should be applied. In addition, you can define the minimum number of remaining digits.

The cutoff algorithm attempts to apply the longest pattern to each node number. Each number is cut a maximum of one time. The station number is then added. Should the resulting number be longer than 22 characters, the final digits are cut off.

7.14.2 Service Information

Remarks

An ADP soft restart is absolutely necessary after the patch is activated.

Restrictions

A maximum of 300 entries are possible in the CDR number modification table.

7.14.3 Generation (Example)

Configure the modification table with the AMO GEFE.

Configuration Examples:

1) Cut off the digits 201 for the CALLING party with node number 1-1-99; seven digits must remain
```
CHANGE-GEFE:NMOD,1-1-99,,201,7,CALLING;
```

2) Cut off the digits 201 for all three parties with node number 1-1-601; five digits must remain. Add the digits 4711 at the front for all three parties with node number 1-1-601.
```
CHANGE-
GEFE:NMOD,1-1-601,4711,201,5,PAYING&CALLING&CONNECTED;
```

3) Add the digits 333 at the front for the connected party with node number 1-1-401.
```
CHANGE-GEFE:NMOD,1-1-401,333,,5,CONNECTED;
```
4) Delete the add-on pattern 444 for node number 1-401.
```
DEL-GEFE:NMOD,1-1-401,333;
```
5) Delete the cutoff pattern 333 for node number 1-401.
```
DEL-GEFE:NMOD,1-1-401,333;
```
6) Delete the add-on pattern 4711 and the cutoff pattern 201 for node number 1-401.
```
DEL-GEFE:NMOD,1-1-601,4711,201;
```

Messages

- Error messages from the modification part (patch):
  ```
  CDR-NM: NO MEMORY!
  ```
  No memory for storing the configuration that was read in.
  ```
  CDR-NM: FILE :CGD:NUMBER-MOD-TAB NOT FOUND
  ```
  No modification table (file) found.
  ```
  CDR-NM: GENERAL ERROR!
  ```
  General error
- Error messages from AMO GEFE:
  ```
  F02: NODE NUMBER MAY NOT BE 0
   F03: LEVEL@ THE NODE NUMBER MAY NOT EXCEED THE VALUE
   @@@
   F04: LEVEL1 OF NODE NUMBER MAY NOT BE 0
   F05: ???Problems accessing hard disk (e.g., A1H1F or
   A1H6F)
   F06: The desired entry already exists.
   F07: It is not possible to add more entries because the
   table
  is full.
   F08: ONLY ONE DADD IS POSSIBLE FOR SAME NODE NUMBER.
   F09: DREM PATTERN ALREADY DEFINED FOR THIS NODE.
   F10: THE ENTRY CANNOT BE DELETED.
   F11: NO ENTRY FOUND.
   H03: ENRTY HAS DELETED SUCCESFULLY.
  ```

8 Groups

8.1 Audible Ringing on Rollover Lines

8.1.1 Feature Description

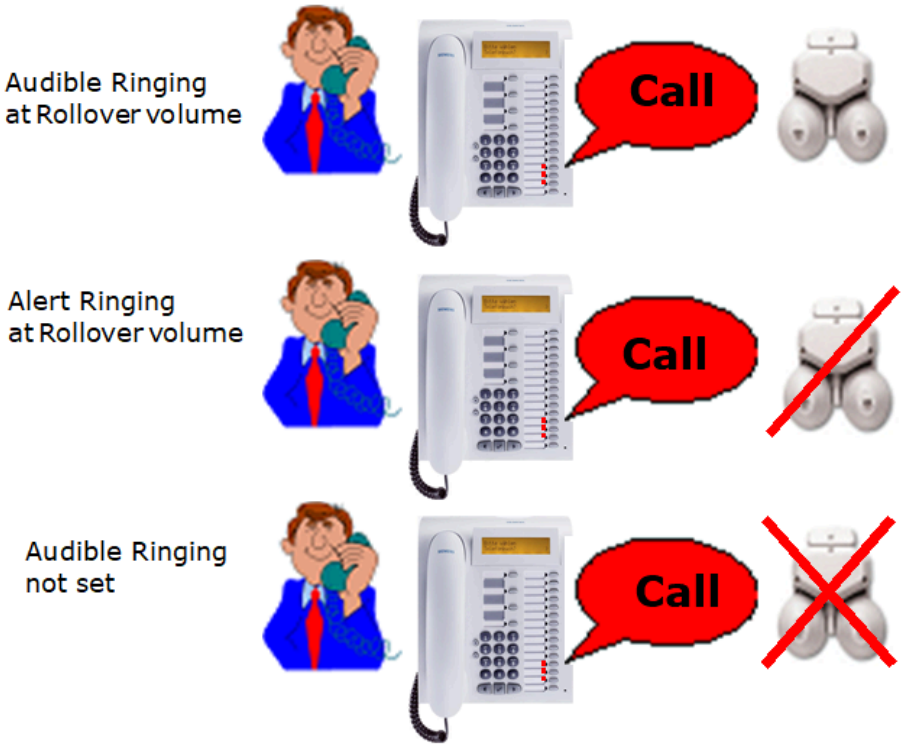


Figure 91: Audible ringing on rollover lines

The "Audible Ringing on Rollover Lines" feature, also known as "Rollover Ringing" provides to customers with keyset telephones, the ability to hear ringing lines signaled at their multi-line telephones, while active on a call. This is especially helpful in high noise environments. The ringing is provided at a user selected Rollover Ringing volume, which may be at a reduced level compared with their ringer volume.

8.1.2 User Interface

The audible signaling of line appearances while the user is busy on a call is provided automatically by the OpenScape 4000 switch, according to administered options, at a volume which may also be individually set and changed by the user, via the phone settings menu.

8.1.3 Service Information

Audible Ringing on Rollover Lines is available on keysets having multiple line appearances. It is configured on a per keyset basis.

The "signal when user is busy" option is provided via Administration (AMO KCSU) to allow one of three rollover ring options, which is assigned to each individual keyset to provide either -

No Ring when active on the telephone,

Alert Ring at the user selected rollover ring volume when active on the telephone, or

Standard Ring at the user selected rollover ring volume when active on the telephone.

Only line appearances which are assigned to audibly ring on the telephone will be signaled when the user is active on the telephone.

An "Alert Ring" is a single short burst of ringing, sometimes also called a "Splash Ring."

Phone setting default values (including Rollover Ring volume) are administered via AMO ZAND, and individual phone settings (including Rollover Ring volume) are administered via AMO ACTDA and via the user's phone settings menu.

8.1.4 Generation (Example)

- Set the default Rollover Ring volume for all Keysets -

  ```
  CHA-ZAND:TYPE=OPTISET,ROLLVOL=3;
  ```

- Set an individual station to have a Rollover Volume of 3 -

  ```
  ADD-ACTDA:TYPE=STN,STNO=3353,FEATCD=OPTISET,
  ROLLVOL=3;
  ```

- Create a Keyset, giving it the Standard Ring option for Rollover Ringing -

  (Note: a station 3259 has already been created with a key standard containing a LINE key at key position 1).

  ```
  ADD-KCSU:STNO=3259,TYPE=PRIM,PRIMKEY=1,
  RIOP=YES,ORLNPF=PRIME,TMLNPF=ALER,
  SGLBMOD=YES,BUSYRING=STAND,OFFTYPE=DI;
  ```

8.1.5 Relevant AMOs

AMO	Parameter Path	New Sub Parameter <value>	Sprache/ Language	Beschreibung / Description
ZAND	TYP= OPTISET	ROLLLAUT =<0-7>	Deutsch	Standard-Rollover-Tonlautstärke für alle Keysets, Wert 0-7

AMO	Parameter Path	New Sub Parameter <value>	Sprache/ Language	Beschreibung / Description
ZAND	TYPE= OPTISET	ROLLVOL =<0-7>	English	Default Rollover Ring Volume for all Keysets, value 0-7.
ACTDA	TYP=TLN, RNR=XXXX, LMACT= OPTISET,	ROLLLAUT =<0-7>	Deutsch	Individuell für eine Sprechstelle eingestellte Rollover-Tonlautstärke, Wert 0-7.
ACTDA	TYPE=STN, STNO=XXXX, FEATCD= OPTISET	ROLLVOL =<0-7>	English	Individual Rollover Ring Volume setting for one station, value 0-7.
KCSU	TLNNU=XXXX, TYP=PRIM	RUFBES =STDTON;	Deutsch	Stellt für eine Sprechstelle die Standard-Rufoption ein (Ruf bei besetztem Telefon), d. h. der Rollover-Ruf wird aktiviert.
KCSU	STNO=XXXX, TYPE=PRIM,	BUSYRING =STAND;	English	Sets Standard Ring option for one station (Standard Ring means Ring while busy) - i.e. provide Rollover Ringing.

8.1.6 Interrelationship with other Features

The Audible Ringing on Rollover Lines feature has an effect on the description of the signalling in "Key system functionality: Multi line access" (see Chapter 85, "Integrated Key Functionality / Multi Line Access")..

8.2 Call Pickup

8.2.1 Directed Call Pickup

The feature is available both locally and throughout the network. You will find a description in Section 76.3.5.2, "Directed Call Pickup".

8.2.2 Local Call Pickup Groups

8.2.2.1 General Information

Users in a node are combined into a local pickup group so that they can take over incoming calls for one another. Users do this by pressing a key or by choosing a pickup code that is uniform throughout the system.

One way to configure call pickup groups is with the AMO AUN. A call pickup group is comprised of users from this node (analog or digital devices). It is possible to connect such a group to a call pickup group of an external OpenScape 4000 node in the framework of a network-wide call pickup (over so-called "remote links", see Section 76.3, "Network-wide Call Pickup").

- System-wide attributes:

  You can use parameters (such as AMO ZAND, OPTISET branch, PICKOPT parameter) to select whether you must press the call pickup key on a Digite once (PICKOPT=NO) or twice (PICKOPT=YES) to pick up a call from a call pickup group. This is valid for the entire system. If the switch is YES, the first time you press the call pickup key in the digit input you go to the directed call pickup. You can then enter the destination number from which you want to pick up a call. In this mode, the second time you press the key the call is picked up from the call pickup group.
- Group-specific attributes:

  For each call pickup group, you can set up the display of the calling user (DISTNO) and the delayed notification ring (NOTRNG). To be able to pick up second calls, you must specify PUSECOND=YES. You can use the parameter SIGNAL to define the type of signaling for incoming calls at the station devices of a group.

- User-specific attributes:

  The subscriber class of service GRPCAL (for example, AMO COSSU) controls whether a user takes part in a group call (see Section 76.2.3, "Pickup Group Call"), that is, whether an arriving call is acoustically signaled (instead of via LED or display). This feature is also referred to as parallel call and is possible locally and network-wide in the framework of a call pickup group.
- Moving users from one call pickup group to another

  You can move users or remote links from one call pickup group to another specific call pickup group with the AMO. You do not have to specify the original group number to do this; the AMO AUN determines it. You only need to specify the user(s) (or 1 remote link) and possibly the group to which you want to move the user(s) (destination group). It is also possible to move an area of users; the AMO AUN looks for the users from the respective groups and gathers them in the destination group. If you do not specify the destination group, the AMO AUN creates the next free group.
- Selecting call pickup groups during configuration or expansion

  It is possible to identify a call pickup group by specifying the station number of a user who is a member of this group. (The parameter GRSTNO was introduced for this purpose.)

  – Do not specify either parameter GRNO or GRSTNO in the ADD command: This creates the next, in increasing order, free call pickup group (for example, if groups 1, 2, 3, and 10 exist: group 4 is added).
  – Specify only the parameter GRNO, not the parameter GRSTNO in the ADD command: This creates or expands the call pickup group identified by GRNO.
  – Specify only the parameter GRSTNO, not the parameter GRNO in the ADD command: This creates or expands the call pickup group that already includes the user identified by GRSTNO.
  – Specify both parameters (GRNO and GRSTNO) in the ADD command: Not allowed, commanded is rejected with an error.
- Deleting users from different call pickup groups

  It is possible to leave out the group number (GRNO) in the DELETE command. In this case, the system determines the group in which a user is a member. You can also delete several users who are not members of the same call pickup group. They are removed from the respective groups.
- Type branch with display or regenerate in the AMO AUN.

8.2.2.2 Service Information

The call pickup key is programmable by the user himself to any feature key. The key-function "call pickup" is offered via service menu.

Restrictions:

- A call pickup group may not have more than 255 members (users + remote links).
- A group may have up to 255 Digits, but you should note that we do not recommend full signaling (SIGNAL=ALL) if there are more than 25 Digits. The default in this case is SIGNAL=LED and the default when there are

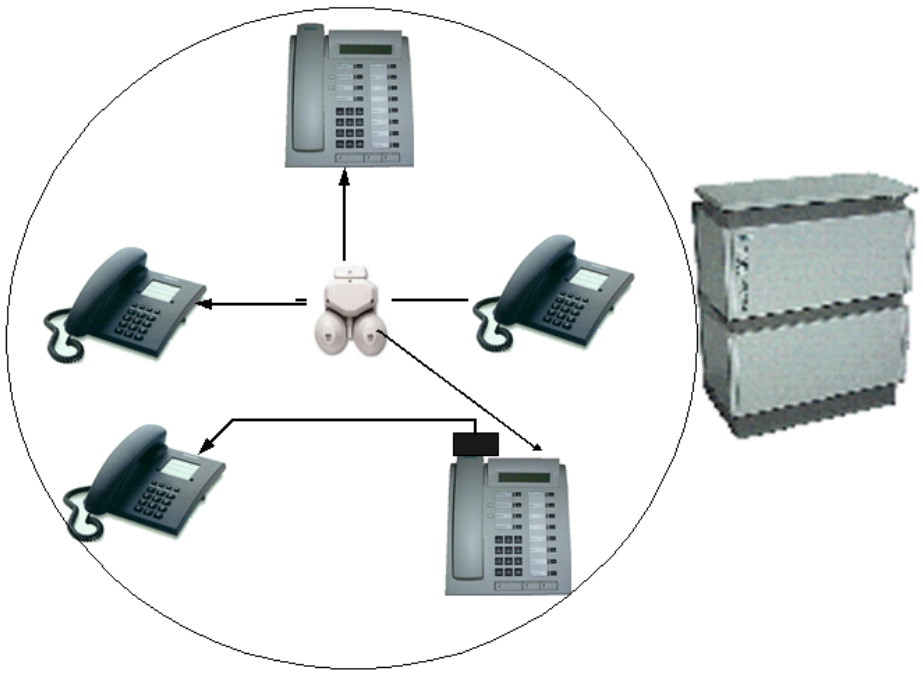
more than 75 Digits is SIGNAL=NONE. You can correct this setting for the particular case.

- You cannot configure more than 1000 call pickup groups. Select and query the current value in the dimensioning (parameter PUGR). If you enter a group number during the configuration, it must be smaller than the PUGR value.
- A user may belong to only one call pickup group.
- The users in a call pickup group may not be silent monitors.
- You may not enter special users in a call pickup group.
- Users in a secretary system may not be in a call pickup group.
- A call pickup group must have at least 1 user. Therefore a group with only a remote link is not allowed.
- The alerting call (NOTRNG) only applies to digital station devices.
- If there are more than 75 stations configured in a pick up group with parameter **GRPCAL** in AMO COSSU, then the calls will not be signalled (no ringing and no display).
- Display update at pickup group members not possible after transfer

  A calls B, B answers and consults to C. C belongs to a pick-up group and the AUN digite members get on the display the notification about B calling C. If B now invokes a transfer, C will have A on the display as caller, but the pick-up group members still see that B is calling C.
- Pickup Group and Hunt Group with parallel ringing

  Only private calls to the hunt group members are signaled on all pickup group members. Calls to the master of a hunt group with parallel ringing are not signaled on other pickup group members

8.2.2.3 Pickup Group Call



When there is a call to a station device (Anate or Digite), it is possible to acoustically call other station devices that belong to the same group if they are programmable (parallel call). All station devices called in parallel receive the same type of call (normal, CO, or special call) and, in the case of Digite, the same display information.

The call goes to the first user in the group to pick up or to take over the call by using the call pickup button or dialing the pickup call code.

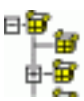
- All station devices that you want to be called in parallel must belong to the same call pickup group and be specially identified for administration purposes (in the Class of Service COS).
- All Digites that are not marked for parallel calling in the call pickup group receive the normal call pickup group signal (display, LED, and alerting call).
- If the code for parallel call is not set in the alternative COS, the user can switch off or on his or her property as member of the group from "station called in parallel" to "station only active for call pickup signaling" by performing a class of service switch.
- During parallel signaling, the system does not check if there is authorization to pickup up or answer the call. Therefore when you configure the group, you should make sure that all users in the group have the necessary authorization (class of service). If not, the user receives a negative acknowledge when answering a parallel call.
- Group call is not implemented for functional terminals. Group call is also allowed for Anates that are connected to optiPoints via terminal T/R adapter.
- The maximum number of groups for group call corresponds to the maximum number of call pickup groups: 1000.
- The maximum number of station devices called in parallel in a group is (as for call pickup groups) 255. However when doing the configuration, note that there is not more than 1 ringing current generator per shelf, so that if more than 10 Anates are simultaneously supplied by the same ringing current generator, the ringing may be not as loud.
- The parallel call to the group is only set up at the end of the initial call. After a user becomes free, there is not a check for additional calls.

8.2.2.4 Generation (Example)

- Releasing the feature:

	You can only release the feature in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	To use the AMO ZAND to release AUN: `CHANGE-FEASU:TYPE=A,CM=PU;`

- Setting the mode for the call pickup key:

	You can only set the mode in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).

	If you want the press to call pickup key only once to pick up the call, you must set the PICKOPT parameter as follows: `CHANGE-ZAND:TYPE=OPTISET,PICKOPT=NO;`

If the parameter is YES, the first press of the call pickup key initiates the directed call pickup. The second time you press the key the call is picked up from the call pickup group.

- Configure the code for call pickup as follows:

	You can only configure a code (with * or #) for call pickup in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	To configure a code for call pickup using the AMO WABE: `ADD-WABE:CD=key_num,DAR=PU;`

- You can configure the number of possible call pickup groups; this number also corresponds to the largest possible group number.

	You can only change the dimensioning data in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	Set the number of possible call pickup groups with the AMO DIMSU, parameter PUGR. `ADD-DIMSU:PUGR=<number>;`

- Configure a new call pickup group with default values as follows:

	Configuration Management --> Groups --> Call Pickup, Extension tab, click New and then enter the number. To add more numbers, click Add (symbol at the right) and enter the other numbers in the new field. (You must repeat this step for each station number.)
	Using default values with the AMO AUN: `ADD-AUN:STNO=<number>;`

- You can configure a new call pickup group with other group-specific parameters as follows:

	Configuration Management --> Groups --> Call Pickup, Extension tab, click New and then enter the number. To add more numbers, click Add (symbol at the right) and enter the other numbers in the new field. (You must repeat this step for each station number.) You can specify and save the separate parameters (such as alerting call) under the Suppl. Data tab.

	Do not use the AMO AUN default values:
	`ADD-AUN:STNO=number[,DISTNO=YES]`
	`[,NOTRNG=PERIOD1][,PUSECOND=YES][,SIGNAL=LED];`

- The user determines the call pickup group number during the reconfiguration.

	Configuration Management --> Groups --> Call Pickup, Extension tab, click New and then enter the number. To add more numbers, click Add (symbol at the right) and enter the other numbers in the new field. (You must repeat this step for each station number.) You can enter and then save the required group number (GRNO) for the call pickup group.
	By entering the number with the AMO AUN: `ADD-AUN:GRNO=21,STNO=<number>;`

- Move users from different call pickup groups into a new call pickup group (number1, number2, number3 are already members of different call pickup groups):

	You can only administer the move of station numbers from one pickup group to a new group in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	Using the AMO AUN to move them is the same as a normal configuration: `ADD-AUN:STNO=<number1&number2&number3>;`

- Extend the call pickup group as follows:

	Configuration Management --> Groups --> Call Pickup, Extension tab, enter the station number of a member of the call pickup group and click Search. Click Add Entry (symbol at the right) and enter the new station number in the new field. (You must repeat this step for each station number.)

	Determine existing call pickup group by the group number and expand the group:
	`ADD-AUN:GRNO=1,STNO=<number>;`
	Or determine existing call pickup group by a user in the group:
	`ADD-AUN:GRSTNO=<number>,STNO=<number>;`

- Change the group-specific parameters of an existing call pickup group as follows:

	Configuration Management --> Groups --> Call Pickup, Extension tab, enter the station number of a member of the call pickup group and click Search. You can change and save the separate parameters (such as alerting call) under the Suppl. Data tab.

	Change with the AMO AUN: `CHANGE-AUN:TYPE=GR,GRNO=1,{[,DISTNO=YES] [,NOTRNG=ONIDLE1][,PUSECOND=YES] [,SIGNAL=NONE]};`

The parameter NOTRNG determines whether or not the alerting call is sent: (default: ON3 = multiple alerting call in all states).

- You can set up the time until the alerting call sounds for the AMOs AUN and CHESE (default 15 sec.).

	You can only administer the time until the alerting call sounds in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	Change the parameter BURST using the AMO DTIM1: `CHANGE-DTIM1:TYPEDH=DIGITE,BURST=<sec>;`

- You can set the time interval for the periodic alerting call (NOTRNG=PERIOD1,PERIOD3) `(default = 5 sec.)`.

	You can only administer the time for the alerting call in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	Change the parameter NOTRNG using the AMO CTIME: `CHANGE-CTIME:TYPESWU=CPTIME1,NOTRNG=<sec>;` (5 to 30 seconds)

- You can determine the parallel call for the call pickup member (set the class of service in the user's COS).

	Configuration Management --> Tables --> Class of Service, tab Voice 1, click parameter GRPCAL (checkmark appears) and save.
	With AMO COSSU (class of service GRPCAL): `CHANGE-COSSU:TYPE=COS,COS=<number>,AVCE=GRPCAL;`

- A floating station registers with PIN on a physical device that is assigned to a call pickup group and additionally activates call forwarding. An incoming call for the floating station is now signaled to the call pickup group members with the name and number of the floating station (instead of the name and number of the physical device on which it has registered).

IMPORTANT: The floating station won't become a member of the call pickup group.

	`CHANGE-ZANDE:TYPE=OPTISET,PINDISP=YES;`

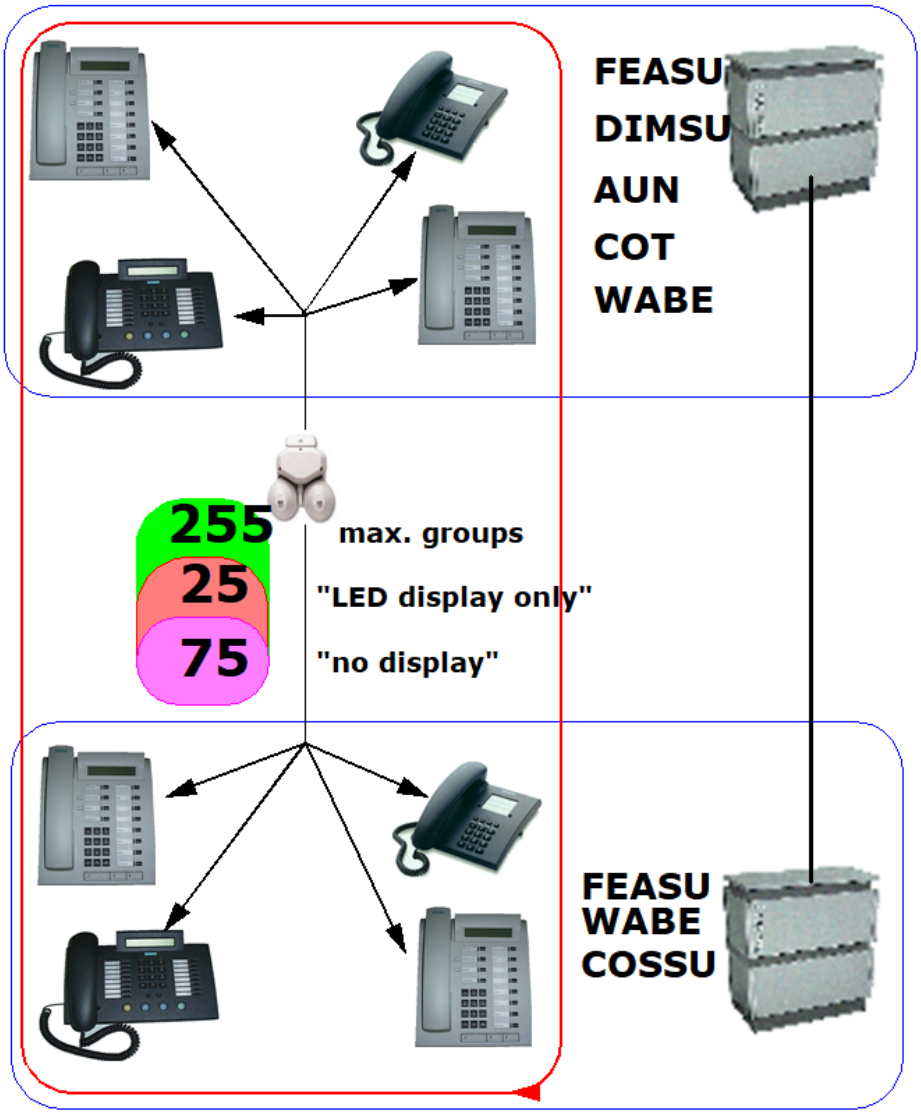
8.2.2.5 Other Remarks

IMPORTANT: When you CHANGE and DELETE call pickup groups, the call pickup feature is no longer blocked. This eliminates any waiting times.

8.2.3 Network-wide Call Pickup

The network-wide call pickup feature is divided into two features:

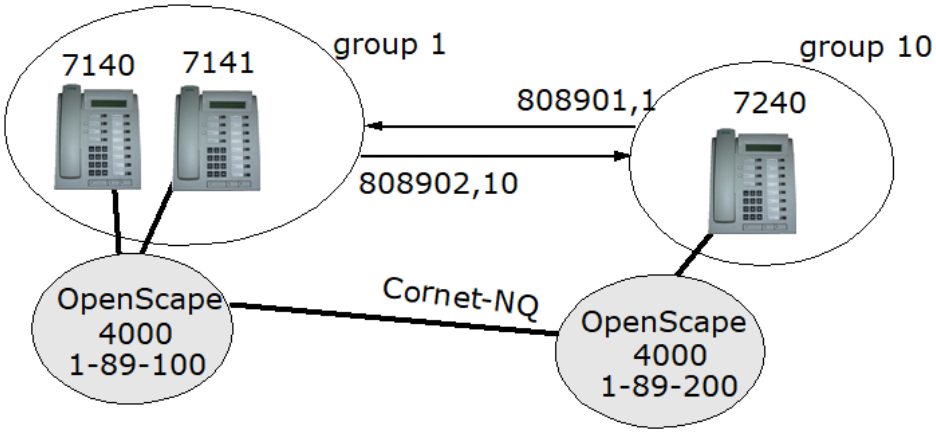
1) Network-wide call pickup groups
2) Directed network-wide call pickup regardless of the affiliation with a call pickup group.



8.2.3.1 Network-wide Call Pickup Groups

8.2.3.1.1 Feature Description

This feature allows you to expand existing local call pickup groups to network-wide call pickup groups ("network-wide call pickup and call parking").



Each call pickup group has a remote connection to other groups; this is identified by an access code (open numbering plan, node code) and the group number.

The network-wide call pickup group acts as if it were in a PBX. Calls to one extension are signaled to all others. During a call query, if the called user is in a different PBX than the calling and querying user (that is, the user is "alone"), path optimization is performed.

Call parking functions in a similar way. Each network-wide call pickup group has its own "parking location".

Each local call pickup group can maintain up to 255 devices or remote connections (at least one device), regardless of the device type (exception: attendant console). If there are more than 25 local Digites, we recommend "LED display only" and if there are more than 75 Digites, "no display". If full signaling is not configured, the group call is deactivated.

Full visual signaling of the information is a new feature (display on demand); you can configure it for the call. Visual signaling always depends on the local group settings. Acoustic call signaling is the same for all network-wide groups.

8.2.3.2 Supported Features

Memory dimensioning (DIMSU) receives the new parameter REMPUGR (sum of remote connections).

All requirements for route optimization must be met in the LCR before network-wide call pickup can function. This means that the outdial rule for the station number that you entered as the remote code must lead to the digit analysis result OWNNODE in the remote system.

All 64 LCOS authorizations are automatically used in the network.

Example: CD Configuration in Closed Numbering NPI Unknown/TON Unknown

Closed numbering				
Source node			Destination node	
AUN	WABE	LODR	WABE	ZAND
REMAC =808902	808902 DAR NETW DESTNO 220	ECHO 1	OWNNODE =808902	PNODECD =808902

Example: CD Configuration in Open Numbering NPI Unknown/TON Unknown

Open numbering NPI unknown				
Source node			Destination node	
Source node			Destination node	
AUN	WABE	LDPLN/LODR	WABE	ZAND
REMAC=92	92 DAR TIE	92-t ECHO 1 NPI unknown TON unknown	OWNNODE =92	PNODECD =92

Example: CD Configuration NPI ISDN / TON LOCAL

Open numbering NPI E164 (ISDN)					
Source node			Destination node		
AUN/ REMAC	WABE	LDPLN/LODR	KNDEF	WABE	ZAND
REMAC= 089100808902	0 TIE	0-89100-808902-T ECHO 2 ECHO 3 NPI ISDN TON LOCAL	CD after cutting own ISDN CD 808902 ISDN Unknown	OWNNODE=808902	PNODECD 808902

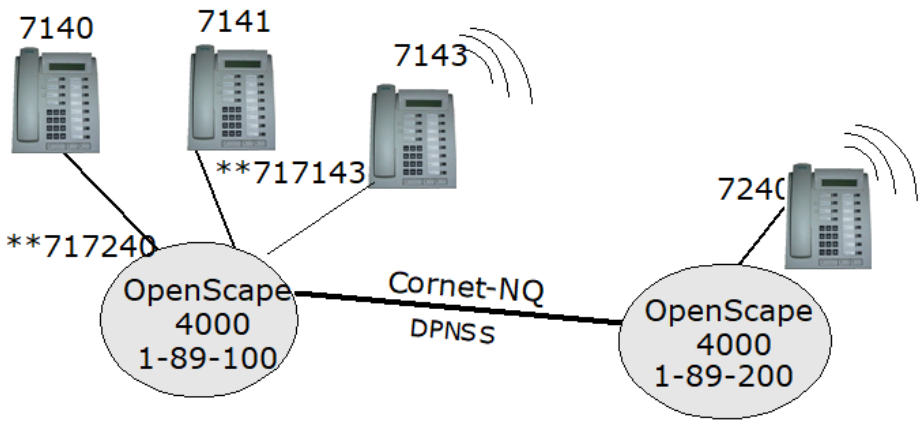
Circuits to and from PBXs before H V 1.0 need the circuit parameter NQPI (between calling and called user, can also be Cornet-N) and NQNP (between querying and called user, cannot be used for call pickup). This is not the case for a dedicated transit system that supports Cornet-NQ.

Remote connections can also lead to PBXs that do not support broadcast signaling (for example, Realitis). If the queue of the local call pickup group

is empty, the system blindly attempts the call pickup at this PBX until it is successful. There are three more parameters for administering each remote connection - whether pickup signaling is transmitted, whether signaling is received, and whether park signaling is supported.

Broadcast signaling is executed over "Temporary Signaling Connections" (TSCs) (one per group to each remote connection that is picked up for signaling or used for the parked call). These TSCs are active until the queue of the call pickup group is empty and the local "parking location" is empty. A timer starts as soon as this situation occurs. When the timer expires, the TSCs are triggered. The default time is 1800 seconds. You can modify it with the parameter GPUNST (for example, AMO CTIME, branch CPTIME). If calls are signaled while the timer is running, the timer stops.

8.2.3.3 Directed Call Pickup



8.2.3.3.1 Feature Description

Starting with Version H V 1.0, directed call pickup, regardless of any call pickup group affiliation, is possible. This feature allows waiting, switched off, or manually held calls at any user to be queried network-wide.

In directed call pickup, you select the feature code (PUDIR) or select the menu option at the terminal and specify the number of the dialed apparatus. This feature applies both locally and network-wide, but is not connected to the classically configured call pickup groups. This mean users can use this function even if they are not in a call pickup group. With the COS authorization (BDCP), a user can protect himself or herself from a directed call pickup. With the COT parameter NQNP, you can block a line for a network wide call pickup (for example, for systems that do not support the feature).

8.2.3.3.2 Special Aspects of the Feature

You can block directed call pickup either in the PBX of the location making the pickup or in the PBX of the called location. To do this, block DIRCPCKP in the feature bit string. To block it at the called party, set the COS parameter BDCP.

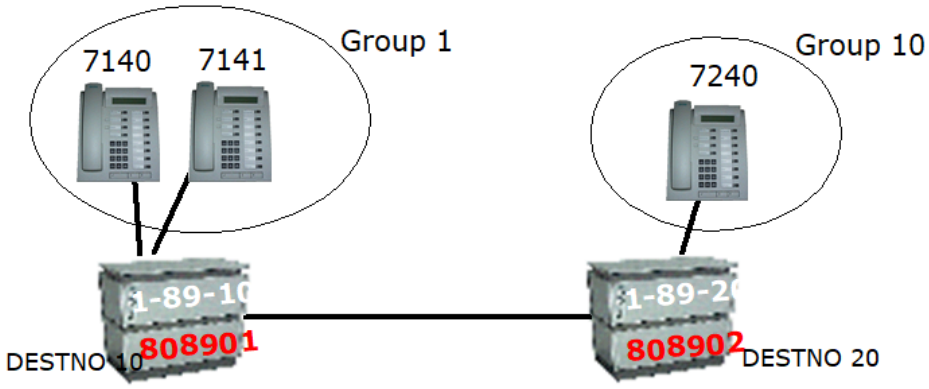
8.2.3.4 Service Remarks

Note the following remarks for both features.

- The systems must be connected using one of the following protocols:
  - Cornet_NQ
  - and DPNSS1
- You may not assign the following station devices in a call pickup group:
  - Attendant console
- The feature is not checked via the dongle.
- You must provide for the digit analysis result "OWNNODE" in the digit analysis and you must enter the parameter PNODECD in the central system data.
- If you use an open numbering plan with NPI unknown, the "OWNNODE" of the remote system is configured to the digit analysis result TIE.
- If you use an open numbering plan with NPI E164 or PNP, the OWNNODE of the remote system does not appear in the digit analysis because the node code of the system is completed to international format or Level 2 format.
- If you use a closed numbering plan, the "OWNNODE" of the remote system is configured to NETW with appropriate destination number.
- After a call is picked up, the system performs path optimization if needed.

8.2.3.5 Generation Notes

8.2.3.5.1 Network-wide Call Pickup



- In closed and open numbering plans

WABE	808902	NETW DESTNO 20	------>	WABE	808902	OWNNODE
				ZAND	808902	PNODECD
WABE	808901	OWNNODE	<-----	WABE	808901	NETW DESTNO 10
ZAND	808901	PNODECD				

- Administer the remote connection in Group 1 as follows:

	You can only administer the number of possible remote call pickup groups in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	Use AMO DIMSU to change the parameter REMPUGR: when needed: `ADD-DIMSU:REMPUGR=1;`

- For open calling plan

WABE	808902	TIE	------>	WABE	808902	OWNNODE
				ZAND	808902	PNODECD
WABE	808901	OWNNODE	<-----	WABE	808901	TIE
ZAND	808901	PNODECD				
KNMAT	808901	UNKNOWN/ OWN		KNMAT	808902	UNKNOWN/ OWN
LODR	(e.g. LWR 1), ECHO 1					
LDAT	(e.g.: LWR 1), ...					
LDPLN		808902-T				

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save TIE as the dial code type.
	Configuring a TIE digit analysis result using the AMO WABE: `ADD-WABE:CD=808901,DAR=TIE;`

	You can only administer remote call pickup in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).

	Configure the group using the AMO AUN:
	`ADD-`
	`AUN:GRNO=1,STNO=7140&7141,REMAC=808902,REMGRNO=10;`

- If the two PBXs do not exchange broadcast signaling (LED/display), administer them as follows:

	Configuration Management --> Groups --> Call Pickup, click New. On the Station number tab, enter the station numbers of the members of the call pickup group. Now change to the Remote Links tab and specify the group number of the remote group (partner system) and select the node code and required signaling parameters and save.
	Configure call pickup group across the network with the AMO AUN: `ADD-AUN:GRNO=1,STNO=7140&7141,REMAC=808902,REMGRNO=10,REMSIGO=N`

- You should deactivate local signaling at the group:

	Configuration Management --> Groups --> Call Pickup, enter the group number that you want to edit under "PU Group" and search. Now change to the Suppl. Data tab and change the setting for signaling to "none" and save.
	Deactivate call pickup group signaling with the AMO AUN: `CHANGE-AUN:TYPE=GR,GRNO=1,SIGNAL=NONE;`

8.2.3.5.2 Directed Call Pickup

- Release directed call pickup with the code **71:

	You can only administer the release of DIRCPCKP in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	Release DIRCPCKP with the AMO FEASU: `CHANGE-FEASU:TYPE=A,CM=DIRCPCKP;`

	You can only administer the digit analysis result PUDIR (with * or #) in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	Configure the digit analysis result PUDIR with the AMO WABE: `ADD-WABE:CD=**71,DAR=PU;`

8.2.3.5.3 Display on Request

- Configure the feature "Display on request" with the code **72:

	You can only administer the digit analysis result PUGDIS (with * or #) in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	Configure the digit analysis result PUGDIS with the AMO WABE: `ADD-WABE:CD=**72,DAR=PUGDIS;`

8.2.3.5.4 Configure call pickup throughout the network on PBXXX

- If a circuit leads to the PBXXX, you must use "Extended Facilities" instead of segmentation for the EConfiguration ManagementA-V2 protocol. The circuit needs the COP parameter ASEG and you must configure the following in the AMO PRODE:

	You can only administer a protocol change in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).

	Make the changes in the protocol with the AMO PRODE:
	`CHANGE-`
	`PRODE:KIND=PD,PDNAME=PD14,SEC=WELMAND,SETNO=14,B10=40,`
	`CHANGE-`
	`PRODE:KIND=PD,PDNAME=PD14,SEC=WELMAND,SETNO=46,B10=42,`
	`CHANGE-`
	`PRODE:KIND=PD,PDNAME=PD14,SEC=WELNAME,CS=00,NO=13,B00=`
	`CHANGE-`
	`PRODE:KIND=PD,PDNAME=PD14,SEC=RESTP,PDBLK=WELHEX,NO=12`
	`CHANGE-`
	`PRODE:KIND=PD,PDNAME=PD14,SEC=ORG,ACTIVE=Y;`

8.2.3.6 AMO Changes

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
AUN	GRUTLNNU	d	Teilnehmerrufnummer, die eine AUN-Gruppe bezeichnet
	GRSTNO	e	station number depicting a pickup group
	REMKZ	d	Remote Knotenkennzahl
	REMAC	e	remote access code
	REMGRUNU	d	Remote Gruppennummer
	REMGRNO	e	remote group number
	SIGNAL	d	Signalisierungsmodus (ALLE, KEINE, LED)
	SIGNAL	e	signaling mode (ALL, NONE, LED)
	REMSIGAB	d	Remote Signalisierung abgehend
	REMSIGO	e	remote signaling outgoing
	REMSIGAN	d	Remote Signalisierung ankommend

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
	REMSIGI	e	remote signaling incoming
	REMSIGPK	d	Remote Signalisierung fuer Parken
	REMSIGPK	e	remote signaling for parking
COSSU	SGAUN	d	Sperren der gezielten Anrufuebernahme
	BDCP	e	blocking of directed call pickup
	UUS1IM	d	Nutzung des Dienstes uus1 implizit
	UUS1IM	e	use of user - user signaling 1 implicit
DIMSU	REMAUNGR	d	Anzahl der AUN-Gruppen in fremden Knoten
	REMPUGR	e	number of pickup groups in remote nodes
COP	ASEG	d	CorNet-NQ Facility Segmentierung ausschalten
	ASEG	e	switch off CorNet-NQ facility segmentation
COT	ETSC	d	Nur ETSI USS3 protokollkonforme Meldungen werden zugelassen
	ETSC	e	UUS ETSI conform
	NQPI	d	CorNet-NQ Pickup-Info nicht unterstützt
	NQPI	e	CorNet-NQ Pickup-Info not supported.
	NQNP	d	CorNet-NQ Netzweite Übernahme nicht unterstützt.
	NQNP	e	CorNet-NQ Network-wide Pick-up not supported.
	UUS1	d	User to user implizit (kommend)
	UUS1	e	UUS Service Class 1 (Connection Setup Basic Call)
	UUSC	d	UUS3 Begrenzung der Datenmenge
	UUSC	e	Congestion Control for User-User Service
CTIME	GPUNST	d	Netzweiter AUN TSC-Abbruch Timer

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
	GPUNST	e	network-wide group pick-up tsc teardown timer
	UUS3T1	d	Maximale Wartezeit auf eine Antwort(Netzwerkseite)
	UUS3T1	e	uus3 request started on called network
	UUS3T2	d	Zeiteinheit für maximale Meldungen pro Zeiteinheit
	UUS3T2	e	uus3 info message started on net side
FEASU	DIRAUN	d	Direkte Anrufübernahme
	DIRCPCKP	e	directed call pick up
TDCSU	UUSCCY	d	Anzahl von Meldungen die pro Zeiteinheit (UU3T2) bis zum Maximum (UUSCCX) aufgestockt wird.
	UUSCCY	e	UUS congestion control Y
WABE	AUNGANZ	d	Anzeige der Gruppen AUN Information anfordern
	PUGDIS	e	display group pickup information on request
	AUNGEZ	d	Gezielte Anrufuebernahme
	PUDIR	e	directed call pickup
ZAND	UUS	d	DIVUUS Umlenkung erlaubt NODIV Umlenkung verboten DIVSUP Umlenkung abhängig von der Berechtigung
	UUS	e	User-User Signalling for DSS1 Devices

8.3 CHESE - Integrated Executive/Secretary System

Integrated executive/secretary systems are created with the AMO CHESE. The AMO is used to assign users to executive/secretary groups, and to define their status (executive, secretary or substitute secretary).

A mailbox can be defined as the forwarding destination for call forwarding if busy and forwarding on no answer for calls to an executive member of a CHESE.

The following points must be borne in mind:

- Only digital telephones can be assigned to an executive/secretary system. Digital telephones without a display (parameter DIGNODIS in SBCSU) cannot be assigned as executive or secretary telephones in a CHESE system. Keysets can not be assigned as executive or secretary. CMI mobile phones, however, can be configured in a CHESE as executive.
- When configuring the telephones, before they are assigned to the executive/secretary system, the appropriate key layout standard must be downloaded from the database (SBCSU, parameter STD). Secretary terminals must be defined by declaring SECR=Y. If a subscriber has been configured with SECR=NO, it can be changed later on to SECR=YES (AMO SBCSU).
- Executive stations and secretary stations require special function keys for the CHESE features:

  1) Executive telephone

  a) one RNGXFER key (transfer of ringing to secretary telephone)
  b) one DSS key (direct station select) for DSS to secretary (also to second secretary telephone if required)

  2) Secretary telephone

  a) one PUS key (call pick-up) for each executive telephone in the configuration
  b) one RNGXFER key for each executive telephone in the configuration (transfer of ringing)
  c) one DSS key per executive telephone (direct station select)
  d) one REP key for activating/deactivating call forwarding to secretary's representative
- The function of the four PUS and RNGXFER keys of the secretary telephone can be changed via the TAPRO AMO, but not at the telephone itself.
- An executive/secretary configuration can comprise up to 4 executive, 2 secretary and 2 substitute secretary terminals (representatives).
- Neither an executive nor a secretary representative terminal may be assigned a hunt group master call number. Secretary terminals, however, are allowed as hunt group masters.
- The executive features FNANS (call forwarding on no answer) and FWDBSY (call forwarding if busy) can be assigned a voice mailbox as a forwarding destination. The following voice mailbox options can be set:

NONE:	Calls to the executive will not be forwarded to a voice mailbox with the FNANS or FWDBSY features (default setting)
EXEC:	The FNANS and FWDBSY features will forward calls to the executive's voice mailbox
SECR:	The FNANS and FWDBSY features will forward calls to the secretary's voice mailbox

  The chosen setting is terminal-specific, and only works if

  – The RNGXFER key on the executive telephone is not activated (i.e. no transfer of ringing to secretary)
  – the voice mail server (VMS) is entered as the FNANS/FWDBSY destination for the executive terminal

  If a secretary has activated the representative (REP) function, this will not affect the feature. However, if the executive has activated the standard call forwarding feature for all calls (FWD), this will take priority.

- Each executive and secretary station can only belong to one group. Secretary representatives can belong to more than one group. Secretary telephones can also be assigned as secretary representatives. Secretary telephones can also be entered in a group without being assigned an executive (second secretary).
- The activation and deactivation of the substitute secretary is initiated at the secretary terminal.
- The REP (substitute secretary) destination can also be assigned with the CHECK key of the secretary terminal. When the REP function is deactivated, the old destination is automatically restored.
- If an executive has entered his or her secretary as a direct station selection destination, this function is automatically transferred to the substitute station if activated, even for substitutes of more than one secretary. When the substitutes are deactivated at the secretary terminal, the DSS destination is changed back.
- Each executive/secretary system is assigned a number for administration purposes. If this number is not explicitly specified when the system is initially added, the AMO automatically assigns the first free number.
- The maximum number of integrated executive/secretary systems is defined with the ES parameter of the DIMSU AMO (max. 1000), and the maximum number of stations in all CHESE systems is limited with the ESSTN parameter.
- Members of an executive/secretary system can also program a MESSENGER key on their terminal. The messenger code leads to an analog port to which a bell or a telephone can be connected. The connection is assigned with the AMO SSC and is allocated an access code for administration purposes rather than a dialling number.
- The timer for the notification ring delay has to be set with parameter BURST of the DTIM1 AMO.
- CHESE calls for the executive which are picked-up by the secretary, are logged in the executive's call log.

  2 or more executives are assigned to one secretary: When one caller calls all executives one after the other, every executive gets an entry in its call-log of not-answered calls. The secretary gets all calls but only the last call is stored in its call-log (update of time of call of the older entry in case of calls from the same caller). After answering/deleting the last call, the call-logs of the other executives is not updated.
- Secretary has enabled the representative function (REP key). If there is an incoming CHESE call for the executive, this is signaled for the representative and now also on the executive's display. An alerting tone is generated for the executive after a time (AMO DTIM1, Parameter **BURST**). This otherwise only happens if the secretary has not activated the representative function.

  ```
  CHANGE-ZANDE:TYPE=OPTISET,CHPARSIG=YES;
  CHANGE-DTIM1:TYPEDH=DIGITE,BURST=<time in seconds>;
  ```

8.3.1 Assign a Secretary Telephone

- Assign the station

  The parameter SECR=Y must be declared in the SBCSU command.

  When adding the terminal with the AMO SBCSU, the appropriate key layout standard must be assigned to the secretary terminal with the parameter STDNO.
- Display service information field of key layouts
  `DIS-TAPRO:TYPE=STD,STD=34&&37,FORMAT=S;`
- Assign an executive user to an executive/secretary system

  ```
  CHA-CHESE:GRNO=number,TYPE=ADDSTN,EXEC=number,
  SECR=number;
  ```
- Assign a secretary user to an executive/secretary system

  ```
  CHA-CHESE:GRNO=number,TYPE=ADDSTN,SECR=number;
  ```
- Assign the executive mailbox as FNANS/FWDBSY destination

  ```
  CHA-CHESE:GRNO=number, TYPE=EXEC,EXEC=number,
  MB=EXEC;
  ```

8.3.2 Assignment of the Messenger Facility

The messenger facility can be assigned to one or more terminals in an executive/secretary system with the AMO ZIEL or a procedure at the terminal. Allocating a messenger to several executive/secretary systems is only feasible if the secretary terminals are in the same office, since it is not possible to establish who has rung. The messenger call is initiated with the messenger button. Prior to deletion the facility must be released from its allocation to executives and secretaries. These allocations are interrogated with the AMO ZIEL. The messenger code must always be 3 digits long so it can be recognized as messenger number by the OpenScape 4000 set.

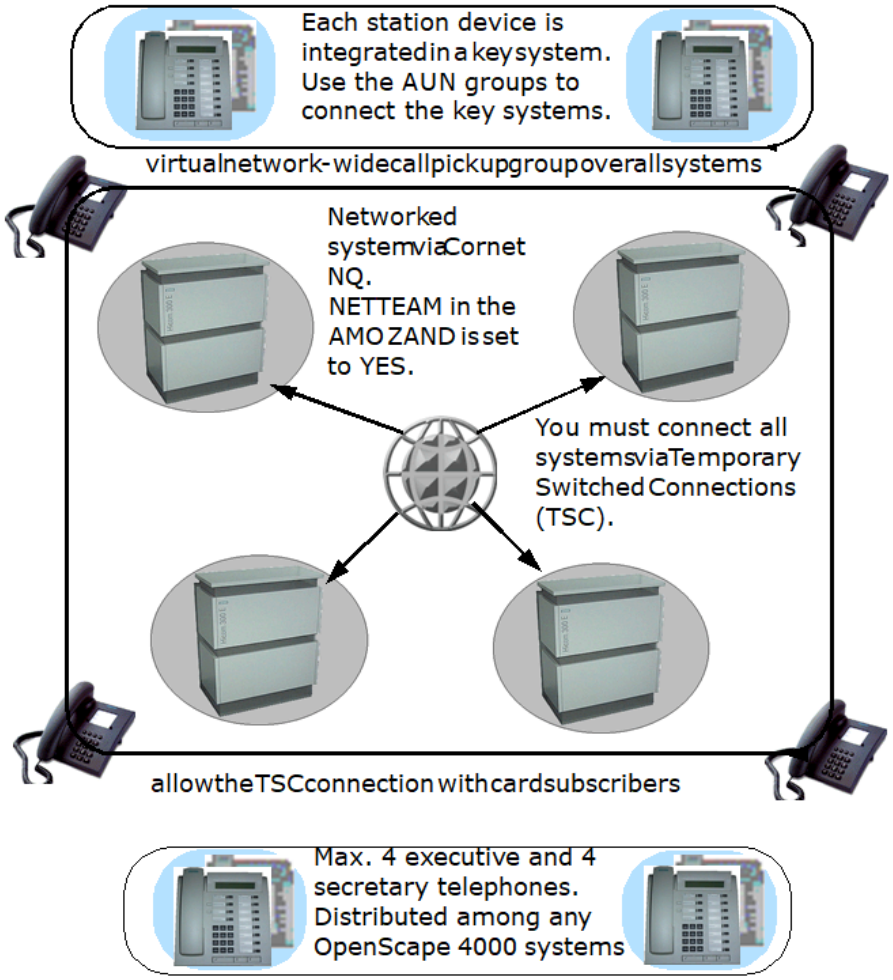
- Add the "messenger key" DAR in the DPLN
  `AD-WABE:CD=key-num,DAR=MSGRKY;`
- Assign messenger to free SLMA
  `AD-SSC:TYPE=MSGR,MSGRNO=number;`

  The messenger number MSGRNO is purely an administration number, and is therefore not entered in the DPLN.
- Assign the messenger key at the executive terminal
  `CHA-TAPRO:STNO=number,KYxx=MSGR;`
- Assign the messenger to the executive telephone
  `AD-ZIEL:TYPE=MSGR,SRCNO=number,DESTNOM=number;`

8.4 CHESE/ Team Functions Network-wide

8.4.1 Feature Description

Use this feature to implement network-wide team functions such as Chese, key set, and network-wide direct station selection.



8.4.1.1 General Information

The "network-wide team" is not a separate feature like the CHESE, but is instead a useful combination of existing independent features with several very special changes, for example, to fit the user interface to the CHESE. The basic features used here are:

- Keyset 300 E
- Network-wide call pickup
- Different versions of call forwarding

All network-wide signaling relationships are produced with the feature "network-wide pickup groups".

8.4.1.2 Team Functions

Secretary systems that are formed as a "network-wide team" have the following features:

- Executive line
- Private line
- Secretary line
- Network-wide direct station selection
- Network-wide signaling of station status
- Voice calling and auto answer
- Ring transfer
- Secretarial function transfer
- Conference corner telephone
- Ringer cutoff

Each member of a team can also use all other features such as callback, do-not-disturb, number redial, call waiting, voice server (with the possibility of saving messages in the mailbox of the executive or the secretary), etc.

All members of a "network-wide team" can be in different network nodes. All features described above are available without restrictions to the team members.

Executive line

Each call to an executive arrives at the executive line (executive station number) either directly or after the secretary forwards it. This is usually the line where he or she makes outgoing calls.

The secretary or secondary secretary is also connected to the executive line of all executives assigned to him or her. The secretaries receive a visual signal (quickly blinking LED) and an acoustic signal (alerting call tone) on these lines for calls to the executive (executive calls). On the other hand, only a quickly blinking LED notifies the executive of a call. The LED lights up as soon as the executive or the secretary takes the incoming call.

The secretary can handle incoming or outgoing calls at any time by changing to any line. This automatically puts the current call on hold. The LED blinks slowly for the held line.

Private line

You can configure a private line (private number) for each executive. The executive can make or accept calls on the private line independently of the executive line. The secretary is not signaled for incoming or outgoing calls on the private line.

The private line can be forwarded independently of the executive line. The forwarding is not signaled on either the display or with an LED.

Secretary line

Each secretary has a separate line (station number) for his or her "personal" calls. The executive normally receives no notification of "personal" secretary calls (secretary's personal line).

Network-wide direct station selection

An executive has a DSS key configured for each secretary to allow him or her to reach the secretary. Of course a secretary can also have a DSS key configured to each of his or her executives. Like the CHESE, the direct station selection does not follow call forwarding. If call forwarding is active at a direct station selection destination, it does not take place.

Network-wide signaling of station status

The DSS key LED signals free or busy network-wide for the partner in question. The DSS key LED displays the following states:

LED off	Partner is free
LED is lit	Partner is busy
LED is blinking	Incoming call to partner You can accept the call by pressing the DSS key for the partner.

Voice calling and auto answer

For security reasons, you can use the administration to configure voice calling and auto answer (one-way hands free intercom system) only for specially identified direct station selection or name keys. Voice calling and auto answer are also possible across nodes.

Ring transfer

By pressing the intercept key of an executive, each secretary can forward incoming executive calls to the secretary apparatus. This secretary then becomes the active secretary. Incoming executive calls are signaled at the secretary acoustically and visually in the display and at the executive by a blinking LED. All other secretaries receive an alerting call tone and a display on their terminals.

If a different secretary presses the intercept key for this executive on his or her telephone, he or she become the active secretary. Executive calls are then forwarded to this secretary (remote call forwarding). In the idle display, the executive always see the name or phone number of the secretary who is currently his or her active secretary.

Each executive can also forward all calls to the secretary by pressing the intercept key.

Intercept key off	Ring transfer to primary secretary is not active; the primary secretary does not receive executive calls
Intercept key on	Ring transfer to primary secretary is active; the primary secretary receives executive calls

Attention: This is a major difference to CHESE!

Secretarial function transfer

- Activating the secretarial function transfer
  - The active secretary can forward all executive calls to a different preselected (using administration software) secretary of the same team by pressing the secretarial function transfer key. The intercept key

LEDs at the forwarding secretary go out. Now the intercept key LEDs at the delegate secretary, the new active secretary, light. The secretarial function transfer key LED does not light there. - Secretary calls are also forwarded to the delegate.

Important: The secretary is not allowed to program the delegate destination; configure this with administration software. Only a user within the same team can be a delegate.

- Deactivating the secretarial function transfer
  - Only the secretary who previously activated the secretarial function transfer can turn it off again by pressing the intercept key (not the delegate key). The secretary only deactivates the secretarial function transfer for the executive in question; the secretary becomes the active secretary for his or her executive again.

  Ring transfer for secretary calls ("personal" calls for the secretary) are still delegated; this can be cancelled either by pressing the FWD key or by using the service menu.

Conference corner telephone

Executive and secretary are always put together in a pickup group. You can also configure a telephone assigned to the executive as a conference corner telephone in the pickup group.

Ringer cutoff

You can configure a ringer cutoff key at the executive to switch off the acoustic signal.

There is then only a visual signal on the display and via LED for incoming calls.

8.4.1.3 Network-wide Team in Combination With Additional Features

Although you can use the network-wide team as a secretary system like the CHESE, some features are treated differently than with the CHESE. The following sections describe the most important features.

Recorded announcement server

If an executive call forwarded to the secretary is not answered within a particular time, it is forwarded to a call forward - no answer destination, if this is configured. Like with the CHESE, with network-wide team you can select whether a call intended for the executive should be directed to the executive mailbox or the secretary (department) mailbox.

If configured, the same also applies for forwarded executive calls to a busy secretary.

- Callback
  - When executive line is busy If executive calls are forwarded to the secretary (normal operation), the system always carries out a callback when the secretary is free again. The callback occurs regardless of whether the executive is free or busy.
  - When executive line is free A callback to a free executive that is signaled at the secretary is not entered in the mailbox. The system always

performs callback on free the next time the executive line or the secretary is free.

8.4.1.4 Comparison of Current Chese With Network-wide Team Function

Network-wide team function	Local Chese
Max. 4 secretaries and max. 4 executives. Each executive has an active secretary.	Max. 2 secretaries and max. 4 executives. Secretary is defined as primary or secondary secretary.
Each user can be in a different system	All in the same system (except with extended connection)
Executive has one line key each for team line and private line. Directed call take over is possible with each key and outgoing calls can be set up on each line. A call pickup key can also be added to takeover second calls.	Executive has one call pickup key for picking up calls forwarded to the secretary and to pick up second calls.
Private number configured as phantom line. Can be forwarded. Can be directly queried.	Private numbers configurable only via code hunt group. No special forwarding of the private number possible.
Executive has intercept key. It lights when calls to the executive are forwarded to the secretary. Major difference.	Executive has intercept key. It lights when calls come directly to the executive; this means without forwarding.
Executive has one DSS key to the secretary. It lights when the secretary is busy on one of the lines. The LED blinks when there is a call to the secretary.	Executive has one DSS key per secretary.. It lights when the secretary is busy and it blinks when there is an acoustic call at the secretary.
Call pickup possible by pressing the blinking DSS key.	Call pickup possible by pressing the blinking DSS key.
Secretary has one line key for calls to the secretary number. It blinks when there is a call and lights when the line is busy.	No special key. No difference between secretary line and executive line
Secretary has line key for calls to the executive that were forwarded to him or her. Key blinks when there is incoming call (in addition to ringing) and lights during a call.	Secretary has call pickup key for each executive. LED blinks if secretary is busy and call does not ring. LED does NOT light during call.
Whichever call is oldest rings at the active secretary, which means there is a queue for waiting calls.	Whichever call is oldest rings at the secretary, which means there is a queue for waiting calls.

Network-wide team function	Local Chese
Secretary has an intercept key for each executive. It lights when calls for the executive are forwarded to this secretary.	Secretary has an intercept key for each executive. It does NOT light when calls for the executive are forwarded to this secretary.
In addition, ring transfer status signaled only at executive (no secondary secretary defined).	In addition, ring transfer status also signaled at executive and secondary secretary.
If another secretary presses the non-lighting intercept key, the forwarding is reprogrammed at the executive to this secretary. Display at executive in idle display. The LED at the previously active secretary goes out.	If the secondary secretary presses the ring transfer key, exactly the same thing happens as when the executive or primary secretary presses the key: the status is changed (activating or deactivating).
Secretary has secretarial function transfer key. When the secretary presses this key, forwarding for all executives for which this secretary is active is reprogrammed to the delegate destination. The secretary number is also forwarded to the delegate destination if it has not been forwarded anywhere else. Secretarial function transfer key LED does NOT light.	Secretary has secretarial function transfer key. When the secretary activates this by pressing the key, executive calls are forwarded to the delegate destination. Secretarial function transfer key LED lights.
No team overlap possible.	Team overlap possible. Delegate can delegate for several teams.
Secretary cannot program delegate. Only via AMO. Delegate must be in team.	Secretary can program delegate. Any delegate.
No reprogramming of DSS key when activating the delegate.	DSS key at executive is reprogrammed to the delegate destination during delegation.
No cancellation of the delegation via secretarial function transfer key; only via intercept key at secretary. When the active secretary presses the lit key, ring transfer switches off and calls come to the executive. If another secretary presses the unlit key, executive calls come to him or her.	Cancellation of the delegation via secretarial function transfer key. LED goes out. Ring transfer status determines who receives the executive calls.

Network-wide team function	Local Chese
Switch off ring transfer at executive so that calls come to the executive. Ring transfer LEDs go out at executive and secretary. If executive switches ring transfer on again, calls go to last active secretary.	Switch off ring transfer so that calls come to the executive. This takes priority over an active delegation. If executive switches ring transfer on again, calls go to delegate destination again.
Executive can program fixed or variable forwarding for executive and private number separately. Calls go to forwarding destination. Ring transfer is also a variable forwarding.	Executive can program fixed or variable forwarding. Calls go to forwarding destination regardless of ring transfer or delegate status. After forwarding is deactivated, the selected ring transfer or delegation is in effect again.
If ring transfer is activated at a secretary, this changes the forwarding destination of the executive calls. This also writes over a forwarding programmed by the executive himself of herself (for example, external).	If ring transfer is activated at a secretary, this does NOT change the forwarding destination of the executive calls. A forwarding programmed by the executive himself of herself does not change.
Forwarded executive calls must be forwarded to the CFNR destination after some time.	No call forwarding - no answer for forwarded executive calls at secretary.
Forwarded executive calls must be forwarded to the call forwarding busy destination when the executive line is busy.	No call forwarding on busy for forwarded executive calls at secretary.
Call back to busy executive line (if forwarded to secretary). Call back is performed when the executive line at the secretary becomes free. Call back occurs regardless of whether the executive apparatus is free.	Call back to busy executive line (if forwarded to secretary). Call back should be performed only when executive and secretary are free.
Call back to free executive line (if forwarded to secretary) cannot be entered in a mailbox because a phantom line never has a mailbox. Therefore it is a callback on free.	Call back to free executive (in call state) is entered in the executive mailbox even if the call was forwarded to the secretary.
Forwarding, forwarding on busy, or call forwarding - no answer to voice mail. For each executive, you can decide whether the voice mail entry should be made in the executive or secretary mailbox.	Forwarding to voice mail.For each system, you can decide whether the voice mail entry should be made in the executive or secretary mailbox.

8.4.1.5 Service Information

- You must follow the generating order given. In particular, before you configure the keys with the AMO TAPRO you must set TEAMBIT with the AMO SDAT because otherwise there is not enough memory for the RNGXFER keys.
- Give all nodes in a network in which the "network-wide team" is configured a new central code with the AMO ZAND that cannot be reset via AMO (only with patch). Various AMOs, which implement the new functions, query this code. This allows mixed operation and the configuration of network-wide teams or "internal teams" of the new kind and internal teams with AMO CHESE. However this should be the exception!
- You can assign a secretary to one or more executives; unlike the "old" CHESE, this assignment is not fixed because it wanders through the delegate function.
- You essentially implement the network-wide team with the feature "network-wide call pickup".
- Delegate function: Each secretary has a REP key to transfer his or her function to a delegate or representative. The delegation can only be to another secretary in this team and is a fixed assignment. You can only change the assignment by disbanding and reconfiguring the team, but this is not critical because the "care" of one or more executives can also be actively transferred by pressing the appropriate RNGXFER key(s). The RNGXFER key at the affected executive is reprogrammed when the delegation is activated.
- Use the AMO AUN to assign a three-digit team number to each station number in a network-wide team, the prime line of the executive, and all phantom lines at the secretaries assigned to this executive. DMS uses this number, which must be unambiguous throughout the network, only for administration purposes. The AMO does not check that the number is unambiguous. The "private line" of the executive (phantom) and the prime line of the secretary telephone do not receive a team number.
- The station devices of network-wide team members are configured as key sets.
- If necessary, the executive is given a "phantom line" as a private line.
- Each secretary receives one "phantom line" for each executive assigned to him or her. These must have the code for group call in their COS so that calls to the executive can also be signaled at the secretary.
- The executive's prime lines and the secretary's phantom lines are identified in the line memory as "executive" or "secr" (AMO SDAT). The executive's "private line" does not receive an executive code.
- Ring transfer: Each executive receives one RNGXFER key that he or she can use to transfer calls (or take them back) on his or her prime line to the secretary. The station number of the currently assigned secretary's phantom line for this executive is entered on the RNGXFER key. If this secretary activates a delegate, then the RNGXFER key is updated with the station number of the corresponding phantom of the current secretary. If several RNGXFER keys were activated at the secretary, the RNGXFER key destinations for all affected executives are rewritten when the delegation is activated. Each secretary receives a RNGXFER key for each assigned executive; he or she can also activate or deactivate the ring transfer for each executive with the key. Thus the secretary can actively take over the delegation for each executive of this team by pressing the corresponding

RNGXFER key. In this case, the destinations are also reprogrammed on the RNGXFER keys of the affected executive.

- PUS keys are not configured.
- Direct station selection network-wide
  - Direct station selection (DSS) destinations (both internal and external) for "network-wide teams" are configured only by AMO (AMO ZIELN); the DSS key is marked as "network-wide" if the destination is external. Use the pickup group to implement the network-wide relationship. The destination must be a member of a call pickup group that is on the source device. Use the new AMO ZIELN to edit all DSS destinations that are involved with the "network-wide team". You cannot change the destinations from a station device. To prevent a flood of messages concerning the signaling of the free and busy status of members of network-wide call pickup groups, station numbers that are entered somewhere as a network-wide DSS destination receive a special "direct station selection destination network-wide" identifier (AMO SDAT).
  - Stations that have network-wide destinations on their DSS keys also receive a code in the line feature "source for network-wide DSS destination". The AMOs ZIEL and ZIELN evaluate this as regards regeneration.
- Each executive receives one DSS key for each secretary in the team. The contents are not reprogrammed when ring transfer is activated. Each secretary receives one DSS key for each executive in the team.
- Call pickup groups for network-wide team:

1 executive/1 secretary	
Call pickup group	prime line (Pri) executive + phantom (Pha) of the secretary for executive
2 executive/1 secretary	
call pickup group 1:	Prime line executive1 + phantom of the secretary for executive 1
Call pickup group 2:	Prime line executive2 + phantom of the secretary for executive 2
4 executive/2 secretary	
Call pickup group 1:	prime line C1 + phantom S1 for executive 1 + phantom S2 for executive 1;
Call pickup group 2:	prime line C2 + phantom S1 for executive 2 + phantom S2 for executive 2;
Call pickup group 3:	prime line C3 + phantom S1 for executive 3 + phantom S2 for executive 3;
Call pickup group 4:	prime line C4 + Phantom S1 for executive + phantom S2 for executive 4
4 executive/4 secretary	
Call pickup group 1:	Pri_C1 + Pha_S1_ C1 + Pha_S2_ C1+Pha_S3_C1 + Pha_S2_C1;

Call pickup group 2:	Pri_C2 + Pha_S1_ C2 + Pha_S2_ C2+Pha_S3_C2 + Pha_S2_C2;
Call pickup group 3:	Pri_C3 + Pha_S1_ C3 + Pha_S2_ C3+Pha_S3_C3 + Pha_S2_C3
Call pickup group 4:	Pri_C4 + Pha_S1_ C4 + Pha_S2_ C4 + Pha_S3_C4 + Pha_S2_C4;

- If there is more than one secretary, you must configure a call pickup between the prime lines of the secretary telephones so that they can accept calls for one another.
- Destination entries (station numbers) RNGXFER key at executive prime line executive + phantom secretary for the executive RNGXFER keys at secretary per executive RNGXFER1: prime line executive 1 + phantom for executive 1 RNGXFER2: prime line executive 2 + phantom for executive 2, etc. Secretarial function transfer keys at the secretary telephone You must save the following for each REP key to activate the function transfer: Station number of the secretary (prime line), station number of the delegate (prime line), and station number of each assigned executive Prime line executive 1 + phantom of the delegate for this executive Prime line executive 2 + phantom of the delegate for this executive, etc.
  - Team DSS key at executive: Prime line for each secretary
  - Team DSS key at secretary Prime line for each executive
  - Voice calling groups. Voice calling goes only to station numbers that are on NAME or DSS keys. These keys must have the code for "voice calling" and "write protection" (AMO ZIELN) and can only be administered via AMO. Therefore you must use the AMO ZAND to set the code "voice calling only in configured user groups" (VCOCUG=YES). This feature has nothing to do with "network-wide teams" and is also not limited to certain types of station devices.
  - You can also add station devices without the "executive" or "secretary" code in the network-wide pickup groups for "network-wide teams". In this way you can implement network-wide direct station selection destinations that are not directly involved in the executive/secretary relationship.
  - General tips concerning the difference between DSS and NAME keys besides the LED, for the DSS key: - FWD is ignored - Do-not-disturb is ignored - With a master HT, the master is called (not the next free station) - Automatic camp-on when destination is busy
- Network-wide team also functions with the APS exchange if the current data is regenerated and then again regenerated, and this is only in individual network nodes.
- It is possible to have mixed operation, or network-wide teams or "internal teams (key systems)" and internal CHESEs, in a system. However this should be the exception!
- No station in a network-wide team is allowed to be in a local Chese.
- The secretary phantom lines must have the group call feature.
- The executive and secretary prime lines must have the FWDFAS and FWDBAS classes of service for the RNGXFER function.
- The prime line of the secretary telephone is the private line as well.
- You must use a terminal with at least 12 function keys for the feature.
- The Remote FWD feature must be released network-wide.

- You can add team members to call pickup groups with teams or remove them only by removing the entire team. Then you must reconfigure the team. The same also applies to moving team members from one node to another. You can, however, supplement or reduce "team call pickup groups" by station numbers that do not have the executive or secretary code (AMO SDAT), for example, because of DSS destination links. (Exception: primary secretary line has secretary code but does not belong to the team.)

Network requirements

- Fictitious network-wide call pickup groups for signaling network-wide direct station selection For signaling the states (ringing, free, busy) of all network-wide direct station selection destinations, configure a "fictitious network-wide call pickup group" to optimize the flood of TSC messages. This signaling is handled over this group. This call pickup group must be in each node that has a direct station selection key configured with a network-wide destination or a network-wide direct station selection destination. This group must be configured ahead of time. In each node in this call pickup group, you must enter remote links to all other nodes that you want to signal. Enter the REMAC to the correct node as the "remote link". Always use the first remote group number as the REMGRNO, although this entry is not evaluated.
- To avoid having to constantly expand this call pickup group, you should enter all nodes that could be considered for the network-wide team in this group as a user during the initial configuration.
- You must configure this call pickup group with a fictitious STN (card subscriber). Use any call pickup group number or the next free one as the "fictitious" group number.
- The parameter NWRES in the AMO AUN identifies the fictitious call pickup during configuration.
- The COT parameters CFVA, TSCS, and BLOC must be included in the COT for the circuits with the network-wide team.

Special features of the network-wide call pickup

- Separate delete branch for the fictitious call pickup group.
- You cannot add to this call pickup group with STN and you cannot delete the fictitious device.
- When you display "All" or areas, they are specially marked in the output. New error messages come with each AMO editing attempt that is denied.
- You can configure only one fictitious call pickup group in a node.
- You are not allowed to simultaneously mark the fictitious group as a "team group". You should check this on both sides.
- You must set all remote signaling parameters (REMSIGxx) to "yes".
- You can regenerate the fictitious call pickup group and you can do this in any order.
- The solution also functions if the group number of the fictitious call pickup group in a node should change for any reason.

8.4.2 Relevant AMOs

8.4.2.1 Overview

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
AUN	NWRES	d	ja = AUN für Teamsignlisierung
	NWRES	e	yes = for networking reserved fictive pu group
	TEAMNR	d	Teamnummer Verwaltungsziffer für DMS
	TEAMNO	e	team number
SDAT	EMERK	d	Teilnehmermerkmal = TEAMSEKR: Teamsekretärfernsprecher TEAMCHEF: Teamcheffernsprecher DRZIEL: Direktrufziel netzweit DIRANS: Direktansprechziel
	AATTR	e	subscriber attribute = TEAMSCR: secretary for netteam TEAMEXEC: executiv for netteam DSSDEST: netwide dss-destination VC voice call
ZAND	NETZTEAM	d	ja = Anlage mit netzweiten Teams Achtung lässt sich nur per Patch löschen!
	NETTEAM	e	yes = Node with network-wide teams CAUTION: Switch off only possible via patch.
	ATONNULL	d	ja = Die Lautstärke des Aufmerksamkeitston kann auf Null gesetzt werden
	ATONZERO	e	yes = Alerttone volume can be set to zero.
	DAINTGR	d	ja =Direktansprechen nur in Interressensgruppen
	VCOCUG	e	yes = Voice calling only in configured usergroups
ZIELN		d	Neuer AMO zum Einrichten der Direktrufnummern, Rufumleitungsziele, Direktansprechen und Vertretertasten (netzweit)
		e	New AMO to activate DSS feature,

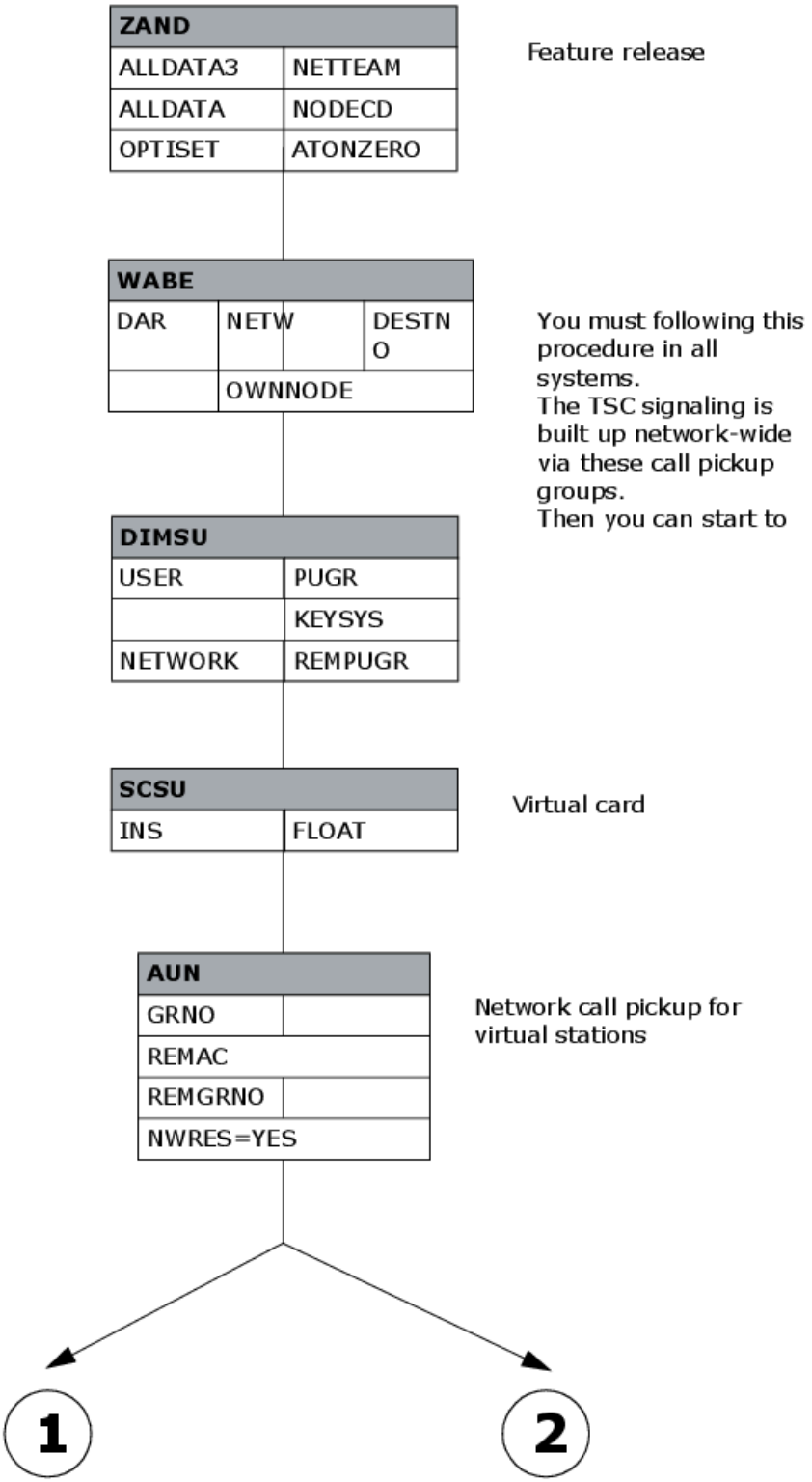
8.4.2.2 Detail

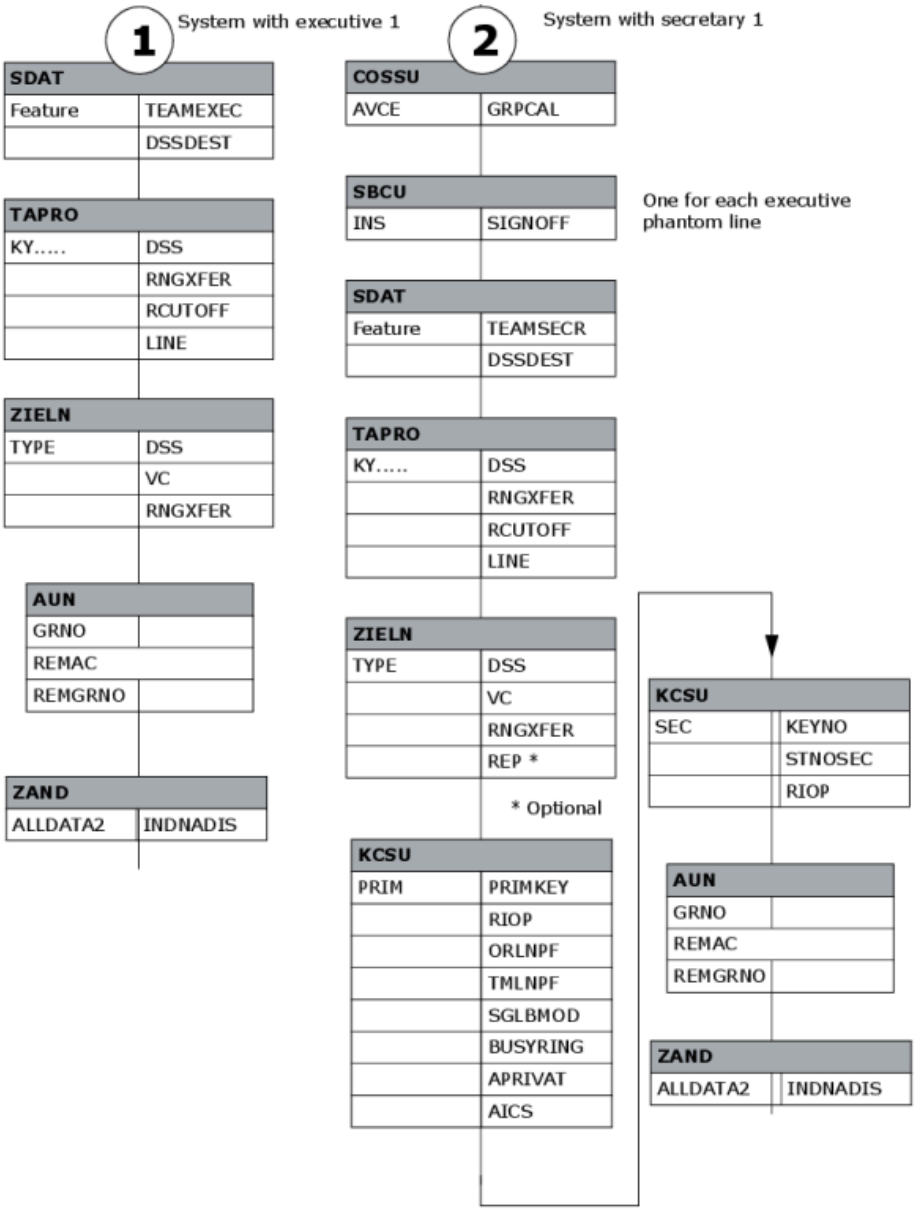
ZAND	Set feature for "administration of network wide team" in each node: NETTEAM=YES. The user can set the volume of the alerting tone to zero: ATONZERO=YES.
COSSU	Set COS for phantom lines of the secretary telephones and the parameters for group call.
SDAT	Define the station number for the "executive" or "secretary" as a team station number (check against ZAND bit). Do this for both the prime lines of the executive and secretary telephones and any executive phantom lines. (Not for the phantom that is configured as the private executive line.)
TAPRO	Assign keys for "executive". For the prime line only, executive receives: **1)** One RNGXFER key. • One DSS key for each possible secretary. • One line key for each station number (prime line of the phantom(s)). For the prime line only, assign keys for "secretary": • One RNGXFER key for each executive in the team. • One REP key. • One DSS key for each executive in the team. • One line key for each station number (prime line of the phantom). (No PUS keys.) (Possibly separate type of key status for executive and secretary.) Keys for executive and secretary for logged-off stations (phantoms) • --> one line key each. • --> remaining keys are irrelevant.
ZIELN	Enter destination, plan for all station numbers in "network-wide format" (max. 22 digits). Executive, only for PRI: • DSS keys for each secretary telephone Enter station number of the prime line for each secretary telephone, including exit code for network-wide destination station numbers. • RNGXFER key Station number of the primary executive line (1st element). Station number of the secretary phantom assigned to this executive (2nd element).

ZIELN	Secretary,only for prime lines: • RNGXFER key for each executive in the team: – Prime line of the assigned executive (1st element). – Secretary phantom for this executive (2nd element). – Identify RNGXFER key for network-wide team operation. • REP key Station number of the secretary prime line (1st element). • – Station number of the delegate prime line (2nd element). And for each assigned executive – PRI executive 1 (3rd element) Delegate phantom for this executive (4th element). – PRI executive 2 (5th element) Delegate phantom for this executive (6th element), etc. – Identify REP for network-wide team operation. • One DSS key for each executive in the team – PRI station number of executive1. – PRI station number of executive2, etc. – Set write protection. – Set code for network-wide for network-wide destinations.
SDAT	Mark stations that are network-wide DSS destinations as such to avoid unnecessary messages at all other call pickup group members when the status changes.
KCSU	Convert terminal to key set and assign station numbers to the line keys (configure PRI and phantoms). Configure logged-off stations (phantoms) as key sets. Executive receives a phantom line as private line. Secretary receives one phantom line for each assigned executive. Parameterize key set. Device-specific for executive and secretary: ORLNPF=PRIME (prime line is automatically seized when the phone is lifted). TMLNPF=RINGP (when there are incoming calls on several lines including the prime line, the prime line is automatically given priority when the phone is lifted). SGLBMOD=YES (use one line key to select and seize).

KCSU	BUSYRING=NORING (if someone is speaking on a line and more calls come on other lines, they are signaled only visually, not acoustically). APRIVAT=NO (not used for team configurations). Prime line for executive and secretary: RIOP= YES (acoustic ring for primary line). AICS=YES (only for station devices with headsets, call is automatically signaled at the headset, no button must be pushed). Phantoms for each executive at the secretary RIOP=YES (when it rings on the phantom and ring transfer is activated, it should also be acoustically signaled. When ring transfer is deactivated, executive calls on the phantom are not acoustically signaled at the secretary - only visual signaling). AICS=YES (see above).
AUN	Form call pickup groups One "fictitious network-wide call pickup group" per node, see Chapter 1, if there are network-wide DSS destinations. For each executive/secretary relationship of a call pickup group, possibly network-wide. 1 executive, 1 secretary PRI executive 1 + phantom secretary 1/executive 1 2 executives, 1 secretary Call pickup group 1: PRI executive 1 + phantom secretary 1/ executive 1 Call pickup group 2: PRI executive 2 + phantom secretary 1/ executive 2 etc.
AUN	Enter team number (also delete and regenerate) For each executive, enter the team number for the key sets with the code "executive" or "secretary" in the line memory for the PRI of the executive and phantoms of the secretary. This is a 3-digit number that must be unambiguous network-wide. This team number is entered for the corresponding station numbers when the call pickup group is formed. For network-wide call pickup, for all corresponding station numbers of the network-wide group pickup in the different nodes. When such a call pickup group is deleted, the team number is also taken away. DMS administers the team number in its own database.
DSSU ACTDA	Switch on team devices, as a precaution, first use ACTDA to deactivate the primary executive line FWD because it is not allowed to be activated.

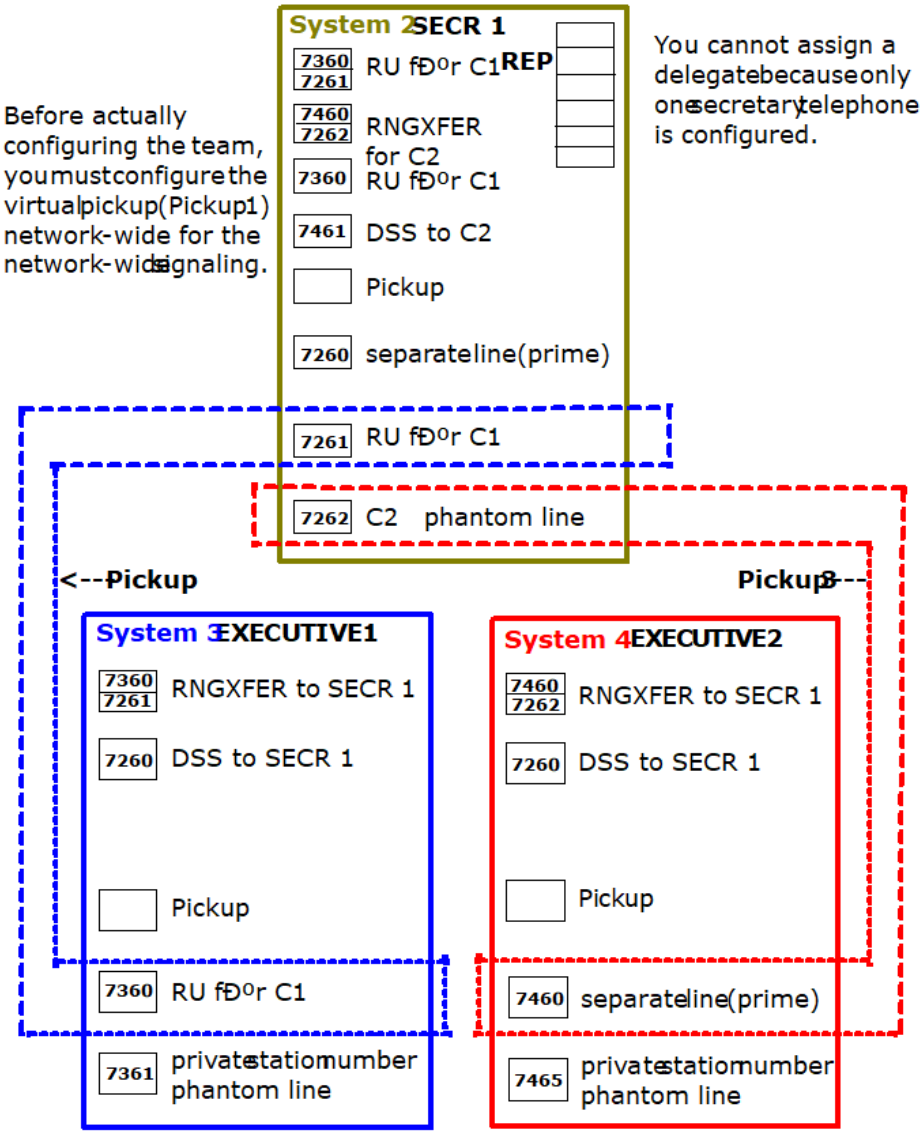
8.4.2.3 Flowchart for Chese 1/1 over 2 Systems





8.4.3 Generation (Examples)

8.4.3.1 Two Executives, One Secretary, Spread Over 3 Systems



8.4.3.1.1 Configure Network-wide Call Pickup for TSC Signaling in Nodes 89-200

- Activate feature.
  `CHANGE-ZAND:TYPE=ALLDATA3,NETTEAM=YES;`
- Configure virtual card subscribers and network call pickup (Pickup 1).

```
ADD-SCSU:STNO=7290,DVCFIG=ANATE,DPLN=0,ITR=0,COS1=3,
COS2=3,LCOSV1=5,LCOSV2=1,LCOSD1=5,LCOSD2=1,INS=FLOAT;

ADD-AUN:GRNO=1,STNO=7290,REMAC=808903,REMGRNO=1,
DISTNO=YES,NOTRNG=ON3,PUSECOND=YES,SIGNAL=ALL,
REMSIGO=YES,REMSIGI=YES,REMSIGPK=YES,NWRES=YES;

ADD-AUN:GRNO=1,REMAC=808904,REMGRNO=1,REMSIGO=YES,
REMSIGI=YES,REMSIGPK=YES;
```

8.4.3.1.2 Configure Network-wide Call Pickup for TSC Signaling in Nodes 89-300

- Activate feature.
  ```
  CHANGE-ZAND:TYPE=ALLDATA3,NETTEAM=YES;
  ```
- Configure virtual card subscribers and network call pickup (Pickup 1).

  ```
  ADD-SCSU:STNO=7390,DVCFIG=ANATE,DPLN=0,ITR=0,COS1=3,
  COS2=3,LCOSV1=5,LCOSV2=1,LCOSD1=5,LCOSD2=1,INS=FLOAT;

  ADD-AUN:GRNO=1,STNO=7390,REMAC=808902,REMGRNO=1,
  DISTNO=YES,NOTRNG=ON3,PUSECOND=YES,SIGNAL=ALL,
  REMSIGO=YES,REMSIGI=YES,REMSIGPK=YES,NWRES=YES;

  ADD-AUN:GRNO=1,REMAC=808904,REMGRNO=1,REMSIGO=YES,
  REMSIGI=YES,REMSIGPK=YES;
  ```

8.4.3.1.3 Configure Network-wide Call Pickup for TSC Signaling in Nodes 89-400

- Activate feature.
  ```
  CHANGE-ZAND:TYPE=ALLDATA3,NETTEAM=YES;
  ```
- Configure virtual card subscribers and network call pickup (Pickup 1).

  ```
  ADD-SCSU:STNO=7490,DVCFIG=ANATE,DPLN=0,ITR=0,COS1=3,
  COS2=3,LCOSV1=5,LCOSV2=1,LCOSD1=5,LCOSD2=1,INS=FLOAT;

  ADD-AUN:GRNO=1,STNO=7490,REMAC=808902,REMGRNO=1,
  DISTNO=YES,NOTRNG=ON3,PUSECOND=YES,SIGNAL=ALL,
  REMSIGO=YES,REMSIGI=YES,REMSIGPK=YES,NWRES=YES;

  ADD-AUN:GRNO=1,REMAC=808903,REMGRNO=1,REMSIGO=YES,
  REMSIGI=YES,REMSIGPK=YES;
  ```

8.4.3.1.4 Configure Executive 1 in System 89-399

- Configure executive telephone with add-on device.
  - You must keep the COS for parameters FWDFAS and FWDBAS for the RNGXFER function.

    ```
    ADD-SBCSU:STNO=7360,OPT=OPTI,CONN=DIR,DVCFIG=OPTIIP,
    COS1=13,COS2=13,LCOSV1=5,LCOSV2=1,LCOSD1=5,LCOSD2=1,
    DPLN=0,ITR=0,REP=1,STD=4;
    ```
- Configure private line for executive with key default for key lines, for example, 25 (optional).

  ```
  ADD-SBCSU:STNO=7361,OPT=OPTI,CONN=DIR,DVCFIG=OPTIIP,
  COS1=13,COS2=13,LCOSV1=5,LCOSV2=1,LCOSD1=5,LCOSD2=1,
  DPLN=0,ITR=0,REP=1,STD=25,,INS=SIGNOFF;
  ```
- Mark executive 1 with team function.

  ```
  CHANGE-SDAT:STNO=7360,TYPE=ATTRIBUT,
  AATTR=TEAMEXEC&DSSDEST;
  ```
- Key assignments for executive 1.

  ```
  CHANGE-TAPRO:STNO=7360,DIGTYP=OPTIA1,KY01=LINE,
  KY02=LINE,KY03=DSS,KY04=RNGXFER,KY05=RNGXFER;
  ```

- Define key functions.
  - Direct station selection to secretary.

    ```
    ADD-ZIELN:STNO=7360,TYPE=DSS,KYNO=22,DESTNOD=7260;
    ```
  - Configure voice calling to secretary.
    ```
    ADD-ZIELN:STNO=7360,TYPE=VC,KYNO=22;
    ```
  - Configure ring transfer destination to secretary.

    ```
    ADD-ZIELN:STNO=7360,TYPE=RNGXFER,KYNO=23,
    STNO1=7360,STNO2=7261;
    ```
- Configure executive key system with private line.

  ```
  ADD-KCSU:STNO=7360,TYPE=PRIM,PRIMKEY=20,RIOP=YES,
  ORLNPF=PRIME,TMLNPF=RING,SGLBMOD=YES,BUSYRING=NORING,
  APRIVAT=NO;
  ```

  - Configure private line as key.
    ```
    ADD-KCSU:STNO=7361,TYPE=PRIM,PRIMKEY=8;
    ```
  - Private line (assign phantom as secondary).

    ```
    ADD-KCSU:STNO=7360,TYPE=SEC,KYNO=21,STNOSEC=7361,
    RIOP=YES;
    ```
- Configure a new call pickup network-wide for executive 1.
  - Call pickup 2 of the partner is in node 200, remote group 2.

    ```
    ADD-AUN:GRNO=2,STNO=7360,REMAC=808902,REMGRNO=2,
    DISTNO=NO,NOTRNG=ON3,PUSECOND=NO,SIGNAL=ALL,TEAMNO=1;
    ```
- Save data.
  ```
  EXEC-UPDAT:BP,ALL;
  ```

8.4.3.1.5 Configure Executive 2 in System 89-400

- Configure executive telephone with add-on device.
  - You must keep the COS for parameters FWDFAS and FWDBAS for the RNGXFER function.

    ```
    ADD-SBCSU:STNO=7460,OPT=OPTI,CONN=DIR,DVCFIG=OPTIIP,
    COS1=13,COS2=13,LCOSV1=5,LCOSV2=1,LCOSD1=1,LCOSD2=1,
    DPLN=0,ITR=0,REP=1,STD=4;
    ```
- Configure private line for executive with key default for key lines, for example, 25 (optional).

  ```
  ADD-SBCSU:STNO=7461,OPT=OPTI,CONN=DIR,DVCFIG=OPTIIP,
  COS1=13,COS2=13,LCOSV1=5,LCOSV2=1,LCOSD1=5,LCOSD2=1,
  DPLN=0,ITR=0,REP=1,STD=25,INS=SIGNOFF;
  ```
- Mark executive 2 with team function.

  ```
  CHANGE-
  SDAT:STNO=7460,TYPE=ATTRIBUT,AATTR=TEAMEXEC&DSSDEST;
  ```
- Key assignments for executive 2.

  ```
  CHANGE-TAPRO:STNO=7460,DIGTYP=OPTIA1,KY01=LINE,
  KY02=LINE,KY03=DSS,KY04=RNGXFER,KY05=RCUTOFF;
  ```

  - Define key functions.

– Direct station selection to secretary.

```
ADD-ZIELN:STNO=7460,TYPE=DSS,KYNO=22,DESTNOD=7260;
```

– Configure voice calling to secretary.

```
ADD-ZIELN:STNO=7460,TYPE=VC,KYNO=22;
```

– Configure ring transfer destination to secretary.

```
ADD-ZIELN:STNO=7460,TYPE=RNGXFER,KYNO=23,
STNO1=7460,STNO2=7262;
```

- Configure executive key system with private line.

```
ADD-KCSU:STNO=7460,TYPE=PRIM,PRIMKEY=20,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,SGLBMOD=YES,BUSYRING=NORING,
APRIVAT=NO;
```

– Configure private line as key.
ADD-KCSU:STNO=7461,TYPE=PRIM,PRIMKEY=8;

– Private line (assign phantom as secondary).

```
ADD-KCSU:STNO=7460,TYPE=SEC,KYNO=21,STNOSEC=7461,
RIOP=YES;
```

- Configure a new call pickup network-wide for executive 2.

– Call pickup 3 of the partner is in node 200, remote group 3.

```
ADD-AUN:GRNO=3,STNO=7460,REMAC=808902,REMGRNO=3,
DISTNO=NO,NOTRNG=ON3,PUSECOND=NO,SIGNAL=ALL,TEAMNO=1;
```

- Save data.
EXEC-UPDAT:BP,ALL;

8.4.3.1.6 Configure Secretary in System 89-200

- Configure with secretary telephone with add-on device.

– You must keep the COS for parameters FWDFAS and FWDBAS for the RNGXFER function.

```
ADD-SBCSU:STNO=7260,OPT=OPTI,CONN=DIR,DVCFIG=OPTIIP,
COS1=13,COS2=13,LCOSV1=5,LCOSV2=1,LCOSD1=5,LCOSD2=1,
DPLN=0,ITR=0,REP=1,STD=4;
```

- Configure COS with group call.

```
ADD-COSSU:COPYCOS=12,NEWCOS=15,AVCE=GRPCAL;
```

- Configure phantom line for executive 1 at secretary (logged off).

```
ADD-SBCSU:STNO=7261,OPT=OPTI,CONN=DIR,DVCFIG=OPTIIP,
COS1=15,COS2=15,LCOSV1=5,LCOSV2=1,LCOSD1=5,LCOSD2=1,
DPLN=0,ITR=0,REP=1,STD=25,IINS=SIGNOFF;
```

- Configure phantom line for executive 2 at secretary (logged off).

```
ADD-SBCSU:STNO=7262,OPT=OPTI,CONN=DIR,DVCFIG=OPTIIP,
COS1=13,COS2=13,LCOSV1=5,LCOSV2=1,LCOSD1=5,LCOSD2=1,
DPLN=0,ITR=0,REP=1,STD=25,INS=SIGNOFF;
```

- Mark secretary with team function.

```
CHANGE-SDAT:STNO=7260,TYPE=ATTRIBUT,
```

```
AATTR=TEAMSECR&DSSDEST;
```

- Mark executive 1 and executive 2 lines as team secretary.

```
CHANGE-SDAT:STNO=7261,TYPE=ATTRIBUT,AATTR=TEAMSECR;

CHANGE-SDAT:STNO=7262,TYPE=ATTRIBUT,AATTR=TEAMSECR;
```

- Key assignments for secretary.

```
CHANGE-TAPRO:STNO=7260,DIGTYP=OPTIA1,KY01=LINE,
KY02=LINE,KY03=DSS,KY04=RNGXFER,KY08=RCUTOFF,
KY09=REP,KY10=LINE,KY11=DSS,KY12=RNGXFER;
```

- Define key functions.
  - Direct station selection to executive 1.

    ```
    ADD-ZIELN:STNO=7260,TYPE=DSS,KYNO=22,DESTNOD=7360;
    ```
  - Direct station selection to executive 2.

    ```
    ADD-ZIELN:STNO=7260,TYPE=DSS,KYNO=30,DESTNOD=7460;
    ```
  - Configure intercept key to executive1 (STN01 = primary line executive 1, STN02 = phantom line 1 secretary).

    ```
    ADD-ZIELN:STNO=7260,TYPE=RNGXFER,KYNO=23,
    STNO1=7360,STNO2=7261;
    ```
  - Configure intercept key to executive2 (STN01 = primary line executive 2, STN02 = phantom line 2 secretary).

    ```
    ADD-ZIELN:STNO=7260,TYPE=RNGXFER,KYNO=31,
    STNO1=7460,STNO2=7262;
    ```
- Configure key system, secretary with 2 executives.

```
ADD-KCSU:STNO=7260,TYPE=PRIM,PRIMKEY=20,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,SGLBMOD=YES,
BUSYRING=NORING,APRIVAT=NO;

ADD-KCSU:STNO=7261,TYPE=PRIM,PRIMKEY=8;

ADD-KCSU:STNO=7262,TYPE=PRIM,PRIMKEY=8;
```

- Assign executive 1 and executive 2 phantom lines as secondary.

```
ADD-KCSU:STNO=7260,TYPE=SEC,KYNO=21,STNOSEC=7261,
RIOP=YES;

ADD-KCSU:STNO=7260,TYPE=SEC,KYNO=29,STNOSEC=7262,
RIOP=YES;
```

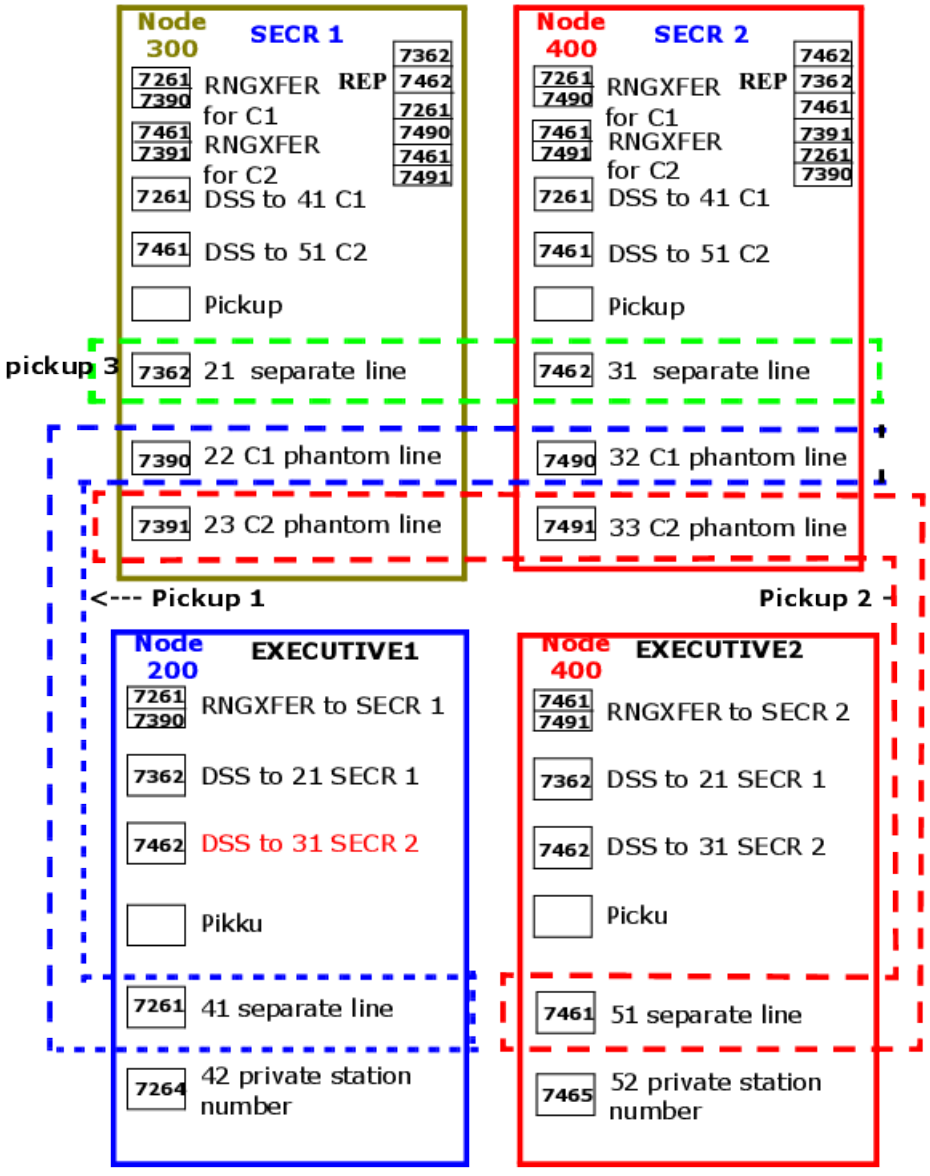
- Connect phantom line1 secretary with primary line of executive 1.
  - Pickup 2 of the partner is in node 300, remote group 2.

    ```
    ADD-AUN:GRNO=2,STNO=7261,REMAC=808903,REMGRNO=2,
    DISTNO=NO,NOTRNG=ON3,PUSECOND=NO,SIGNAL=ALL,
    TEAMNO=1;
    ```
- Connect phantom line 2 of secretary with primary line of executive 2.
  - Call pickup 3 of the partner is in node 400, remote group 3.

```
ADD-AUN:GRNO=3,STNO=7262,REMAC=808904,REMGRNO=3,
DISTNO=NO,NOTRNG=ON3,PUSECOND=NO,SIGNAL=ALL,
TEAMNO=1;
```

- Save data.
  `EXEC-UPDAT:BP,ALL;`

8.4.3.2 Two Executives and Two Secretaries, Spread Over 3 Systems



8.4.3.2.1 General Section in System 3 (Node 300)

- Activate feature.

  `CHANGE-ZAND:TYPE=ALLDATA3,NETTEAM=YES;`
- Display the closed numbering among the 3 systems.

  `DISPLAY-WABE:TYPE=GEN,DAR=NETW&OWNNODE;`

- Configure virtual call pickup groups with card subscribers.

```
ADD-SCSU:STNO=7395,DVCFIG=ANATE,DPLN=0,ITR=0,
COS1=3,COS2=3,LCOSV1=5,LCOSV2=5,LCOSD1=5,LCOSD2=5,
INS=FLOAT;
```

- Check if enough memory is available.

```
DISPLAY-DIMSU:TYPE=ALL,PARAM=PUGR;

DISPLAY-DIMSU:TYPE=NETWORK,PARAM=REMPUGR;
```

- Configure the network pickup. Set NWRES=YES.

```
ADD-AUN:GRNO=555,STNO=7395,REMGRNO=555,DISTNO=YES,
NOTRNG=ON3,PUSECOND=YES,REMSIGO=YES,REMSIGI=YES,
REMSIGPK=YES,NWRES=YES;

ADD-AUN:GRNO=555,REMAC=808904,REMGRNO=555,
REMSIGO=YES,REMSIGI=YES,REMSIGPK=YES;
```

8.4.3.2.2 General Section in System 2 (Node 200)

- Activate feature.

```
CHANGE-ZAND:TYPE=ALLDATA3,NETTEAM=YES;
```

- Display the closed numbering among the 3 systems.

```
DISPLAY-WABE:TYPE=GEN,DAR=NETW&OWNNODE;
```

- Configure virtual call pickup groups with card subscribers.

```
ADD-SCSU:STNO=7295,DVCFIG=ANATE,DPLN=0,ITR=0,
COS1=3,COS2=3,LCOSV1=5,LCOSV2=5,LCOSD1=5,
LCOSD2=5,INS=FLOAT;
```

- Check if enough memory is available.

```
DISPLAY-DIMSU:TYPE=ALL,PARAM=PUGR;

DISPLAY-DIMSU:TYPE=NETWORK,PARAM=REMPUGR;
```

- Configure the network pickup. Set NWRES=YES.

```
ADD-AUN:GRNO=555,STNO=7295,REMAC=808903,
REMGRNO=555,DISTNO=YES,NOTRNG=ON3,PUSECOND=YES,
REMSIGI=YES,REMSIGPK=YES,NWRES=YES;

ADD-AUN:GRNO=555,REMAC=808904,REMGRNO=555,
DISTNO=YES,NOTRNG=ON3,PUSECOND=YES,REMSIGO=YES,
REMSIGI=YES,REMSIGPK=YES;
```

8.4.3.2.3 General Section in System 4 (Node 400)

- Activate feature.

```
CHANGE-ZAND:TYPE=ALLDATA3,NETTEAM=YES;
```

- Display the closed numbering among the 3 systems.

```
DISPLAY-WABE:TYPE=GEN,DAR=NETW&OWNNODE;
```

- Configure virtual call pickup groups with card subscribers.

```
ADD-SCSU:STNO=7495,DVCFIG=ANATE,DPLN=0,ITR=0,
COS1=40,COS2=40,LCOSV1=16,LCOSV2=16,LCOSD1=32,
LCOSD2=32,INS=FLOAT;
```

- Check if enough memory is available.

```
DISPLAY-DIMSU:TYPE=ALL,PARAM=PUGR;

DISPLAY-DIMSU:TYPE=NETWORK,PARAM=REMPUGR;
```

- Configure the network pickup. Set NWRES=YES.

```
ADD-AUN:GRNO=555,STNO=7495,REMAC=808902,
REMGRNO=555,DISTNO=YES,NOTRNG=ON3,PUSECOND=YES,
REMSIGO=YES,REMSIGI=YES,REMSIGPK=YES,NWRES=YES;

ADD-AUN:GRNO=555,REMAC=808903,REMGRNO=500,
REMSIGO=YES,REMSIGI=YES,REMSIGPK=YES;
```

8.4.3.2.4 Configure Executive 1 in Node 300

Identify the configured standard station 7261 Stn as the executive and set the direct station selection (DSS) feature. This establishes that this station device is a network-wide direct station selection destination. You do not have to do this for internal direct station selection destinations.

```
CHANGE-SDAT:STNO=7261,TYPE=ATTRIBUT,
AATTR=DSSDEST&TEAMEXEC;
```

- Add-on device for executive 1.

```
CHANGE-SBCSU:STNO=7261,OPT=OPTI,REP=1;
```

- Define key assignments for executive function.

```
CHANGE-TAPRO:STNO=7261,DIGTYP=OPTIA1,KY01=DSS,
KY02=RNGXFER,KY03=DSS,KY06=RCUTOFF,KY07=LINE,
KY08=LINE;
```

- Direct station selection for executive 1 to secretary 1 and secretary 2.

```
ADD-ZIELN:STNO=7261,TYPE=DSS,KYNO=20,DESTNOD=7362;

ADD-ZIELN:STNO=7261,TYPE=DSS,KYNO=22,DESTNOD=7462;
```

- Configure voice calling to secretary.

```
ADD-ZIELN:STNO=7261,TYPE=VC,KYNO=20;
```

- Configure ring transfer destination to secretary 1.

```
ADD-ZIELN:STNO=7261,TYPE=RNGXFER,KYNO=21,
STNO1=7261,STNO2=7390;
```

- Configure phantom line for private station number, executive 1.

```
ADD-COSSU:NEWCOS=50,AVCE=FWDBAS&FWDECA&FWDEXT&
FWDNWK&FWDFAS&FWDDIR&MB&COSXCD&TA&CDRSTN&CDRC&
GRPCAL&TNOTCR;

ADD-SBCSU:STNO=7264,OPT=OPTI,CONN=DIR,DVCFIG=OPTIIP,
COS1=50,COS2=50,LCOSV1=5,LCOSV2=5,LCOSD1=5,LCOSD2=5,
DPLN=0,ITR=0,COSX=0,REP=1,STD=26,INS=SIGNOFF,
ALARMNO=0,CBKBMAX=5,TEXTSEL=GERMAN,HMUSIC=0,
```

```
CALLOG=TRIES,SERVID=0;
```

- Configure executive 1 as key set.
  - Check if enough memory is available.

```
DISPLAY-DIMSU:TYPE=CC,CCTLOPT=KEYSYS;

ADD-KCSU:STNO=7261,TYPE=PRIM,PRIMKEY=26,
RIOP=YES,ORLNPF=PRIME,TMLNPF=RING,SGLBMOD=YES,
BUSYRING=NORING;
```

- Configure private line for executive 1 (optional).

```
ADD-KCSU:STNO=7264,TYPE=PRIM,PRIMKEY=27,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,SGLBMOD=YES,BUSYRING=NORING;

ADD-KCSU:STNO=7261,TYPE=SEC,KYNO=27,STNOSEC=7264,
RIOP=YES;
```

- Configure call pickup group between Pri_executive + Pha_executive at secretary 1 and secretary 2 (call pickup 1).

```
ADD-AUN:GRNO=1,STNO=7261,REMAC=80893,REMGRNO=1,
DISTNO=YES,NOTRNG=ON3,PUSECOND=NO,SIGNAL=ALL;

ADD-AUN:GRNO=1,REMAC=808904,REMGRNO=1,REMSIGO=YES,
REMSIGI=YES,REMSIGPK=YES;
```

- Assign team number for DMS, unambiguous in the network.
  `CHANGE-AUN:TYPE=GR,GRNO=1,TEAMNO=1;`
- To have only the name of the executive phantom line and not the station number displayed when there is RNGXFER, you can change the ZAND as follows:
  `CHANGE-ZAND:TYPE=ALLDATA2,INDNADIS=YES;`

8.4.3.2.5 Configure Executive 2 in Node 400

Identify the configured standard station 7461 Stn as the executive and set the direct station selection (DSS) feature. This establishes that this station device is a network-wide direct station selection destination. You do not have to do this for internal direct station selection destinations.

```
CHANGE-SDAT:STNO=7461,TYPE=ATTRIBUT,
AATTR=DSSDEST&TEAMEXEC;
```

- Add-on device for executive.

```
CHANGE-SBCSU:STNO=7461,OPT=OPTI,REP=1;
```

- Define key assignments for executive function.

```
CHANGE-TAPRO:STNO=7461,DIGTYP=OPTIA1,KY01=DSS,
KY02=RNGXFER,KY03=DSS,KY06=RNGXFER,KY07=LINE,
KY08=LINE;
```

- Direct station selection for executive 1 to secretary 1 and secretary 2.

```
ADD-ZIELN:STNO=7461,TYPE=DSS,KYNO=20,DESTNOD=7362;

ADD-ZIELN:STNO=7461,TYPE=DSS,KYNO=22,DESTNOD=7462;
```

- Ring transfer destination is secretary 2.

```
ADD-ZIELN:STNO=7461,TYPE=RNGXFER,KYNO=21,STNO1=7461,
STNO2=7491;
```

- Configure COS with GRPCAL for phantom user.

```
ADD-COSSU:NEWCOS=50,AVCE=FWDBAS&FWDECA&FWDEXT&
FWDNWK&FWDFAS&FWDDIR&MB&COSXCD&TA&CDRSTN&CDRC&
GRPCAL&TNOTCR;
```

- Configure phantom line for private station number, executive 2 (optional).

```
ADD-SBCSU:STNO=7464,OPT=OPTI,CONN=DIR,DVCFIG=OPTIIP,
COS1=50,COS2=50,LCOSV1=1,LCOSV2=1,LCOSD1=1,LCOSD2=1,
DPLN=0,ITR=0,COSX=0,REP=1,STD=26,INS=SIGNOFF,
ALARMNO=0,CBKBMAX=5,TEXTSEL=GERMAN,HMUSIC=0,
CALLOG=TRIES,SERVID=0;
```

- Configure executive 2 as key set.
  - Check if enough memory is available.

```
DISPLAY-DIMSU:TYPE=CC,CCTLOPT=KEYSYS;

ADD-KCSU:STNO=7461,TYPE=PRIM,PRIMKEY=26,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,SGLBMOD=YES,BUSYRING=NORING;
```

- Configure private line for executive 2.

```
ADD-KCSU:STNO=7464,TYPE=PRIM,PRIMKEY=27,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,SGLBMOD=YES,BUSYRING=NORING;

ADD-KCSU:STNO=7461,TYPE=SEC,KYNO=27,STNOSEC=7464,
RIOP=YES;
```

- Configure key assignments for conference corner telephone.

```
CHANGE-TAPRO:STNO=7465,DIGTYP=OPTIIP,KY04=LINE,
KY10=LINE;
```

- Conference corner telephone is configured as key set (optional).

```
ADD-KCSU:STNO=7465,TYPE=PRIM,PRIMKEY=4,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,SGLBMOD=YES,BUSYRING=NORING,
AICS=YES;
```

- Executive prime line is configured as secondary line.

```
ADD-KCSU:STNO=7465,TYPE=SEC,KYNO=10,STNOSEC=7461,
RIOP=YES;
```

8.4.3.2.6 Configure Secretary 1 in Node 300

Station 7362 is already configured as a normal station.

- Configure COS with GRPCAL for phantom user.

```
ADD-COSSU:NEWCOS=50,AVCE=FWDBAS&FWDECA&
FWDEXT&FWDNWK&FWDFAS&FWDDIR&MB&COSXCD&
TA&CDRSTN&CDRC&GRPCAL&TNOTCR;
```

- Phantom line for executive 1 at secretary 1.

```
ADD-SBCSU:STNO=7390,OPT=OPTI,CONN=DIR,DVCFIG=OPTIIP,
COS1=50,COS2=50,LCOSV1=50,LCOSV2=1,LCOSD1=1,LCOSD2=1,
DPLN=0,ITR=0,COSX=0,REP=1,STD=26,SECR=N,
```

```
INS=SIGNOFF,ALARMNO=0,CBKBMAX=5,TEXTSEL=GERMAN,,
HMUSIC=0,SERVID=0;
```

- Configure phantom line for executive 2 at secretary 1.

```
ADD-SBCSU:STNO=7391,OPT=OPTI,CONN=DIR,DVCFIG=OPTIIP,
COS1=13,COS2=13,LCOSV1=1,LCOSV2=1,LCOSD1=1,LCOSD2=1,
DPLN=0,ITR=0,COSX=0,REP=1,STD=26,SECR=N,
INS=SIGNOFF,ALARMNO=0,CBKBMAX=5,TEXTSEL=GERMAN,
HMUSIC=0,SERVID=0;
```

- Mark prime line and phantom line at secretary 1 as team secretary.

```
CHANGE-SDAT:STNO=7362,TYPE=ATTRIBUT,AATTR=DSSDEST&
TEAMSECR;

CHANGE-SDAT:STNO=7390,TYPE=ATTRIBUT,AATTR=TEAMSECR;

CHANGE-SDAT:STNO=7391,TYPE=ATTRIBUT,AATTR=TEAMSECR;
```

- Configure add-on device for secretary 1.

```
CHANGE-SBCSU:STNO=7362,OPT=OPTI,REP=1;
```

- Define key assignments for secretary function.

```
CHANGE-TAPRO:STNO=7362,DIGTYP=OPTIA1,KY01=DSS,
KY02=RNGXFER,KY03=LINE,KY04=DSS,KY05=RNGXFER,
KY06=LINE,KY07=RCUTOFF,KY08=LINE,KY09=REP;
```

- Configure direct station selection for secretary 1 to executive 1 and executive 2.

```
ADD-ZIELN:STNO=7362,TYPE=DSS,KYNO=20,DESTNOD=7261;

ADD-ZIELN:STNO=7362,TYPE=DSS,KYNO=23,DESTNOD=7461;
```

- Define ring transfer destinations for secretary 1 to executive 1 and executive 2.

```
ADD-ZIELN:STNO=7362,TYPE=RNGXFER,KYNO=21,STNO1=7261,
STNO2=23851;

ADD-ZIELN:STNO=7362,TYPE=RNGXFER,KYNO=24,STNO1=7461,
STNO2=23852;
```

- Define delegate for secretary 1 is secretary 2.

```
ADD-ZIELN:STNO=7362,TYPE=REP,STNOREP=7462,
STNOEX1=7261,STNOEX1R=7490,STNOEX2=7461,
STNOEX2R=7491;
```

- Configure secretary 1 as key set with phantom line for executive 1 and executive 2.

```
ADD-KCSU:STNO=7362,TYPE=PRIM,PRIMKEY=27,
RIOP=YES,ORLNPF=PRIME,TMLNPF=RING,SGLBMOD=YES,
BUSYRING=NORING;

ADD-KCSU:STNO=7390,TYPE=PRIM,PRIMKEY=22,
RIOP=YES,ORLNPF=PRIME,TMLNPF=RING,SGLBMOD=YES,
BUSYRING=NORING;
```

```
ADD-KCSU:STNO=7391,TYPE=PRIM,PRIMKEY=25,
RIOP=YES,ORLNPF=PRIME,TMLNPF=RING,SGLBMOD=YES,
BUSYRING=NORING;

ADD-KCSU:STNO=7362,TYPE=SEC,KYNO=22,STNOSEC=7390,
RIOP=YES;

ADD-KCSU:STNO=7362,TYPE=SEC,KYNO=25,STNOSEC=7391,
RIOP=YES;
```

- Connect prime line from executive 1 (node 200) with phantom line of secretary 1 and secretary 2 via the network-wide call pickup 1.

```
ADD-AUN:GRNO=1,STNO=7390,REMAC=808902,REMGRNO=1,
DISTNO=NO,NOTRNG=ON3,PUSECOND=NO,SIGNAL=ALL;

ADD-AUN:GRNO=1,REMAC=808904,REMGRNO=1,DISTNO=NO,
NOTRNG=ON3,PUSECOND=NO,SIGNAL=ALL;
```

- Connect prime line from executive 2 with phantom line of secretary 2 and secretary 2 with help of the network-wide call pickup 2.

```
ADD-AUN:GRNO=2,STNO=7391,REMAC=808904,REMGRNO=2,
DISTNO=YES,NOTRNG=ON3,PUSECOND=NO,SIGNAL=ALL;
```

- Connect prime line of secretary 1 with prime line of secretary 2 via call pickup 3.

```
ADD-AUN:GRNO=3,STNO=7362,REMAC=808904,REMGRNO=3,
DISTNO=YES,NOTRNG=ON3,PUSECOND=NO,SIGNAL=ALL;
```

- Assign team number for DMS, unambiguous in the network.

```
CHANGE-AUN:TYPE=GR,GRNO=1,TEAMNO=1;

CHANGE-AUN:TYPE=GR,GRNO=2,TEAMNO=1;
```

- Give secretary 1 a name.

```
ADD-PERSI:TYPE=STN,STNO=7362,NAME="SECR 1";
```

- Give phantom line a name that appears during ring transfer.

```
ADD-PERSI:TYPE=STN,STNO=7390,NAME="SECR 1*";

ADD-PERSI:TYPE=STN,STNO=7391,NAME="SECR 1*";
```

- You must configure executive phantom lines that are at the secretary as secret users so that the caller does not see the station number of the phantom line during ring transfer.

```
CHANGE-SBCSU:STNO=7390,SSTNO=Y;

CHANGE-SBCSU:STNO=7391,SSTNO=Y;

CHANGE-ZAND:TYPE=ALLDATA2,DISPTGNA=YES;
```

- Only the name of the executive phantom line is displayed during ring transfer. The name is displayed independently of the station number display. This parameter applies system wide for all station devices.
  `CHANGE-ZAND:TYPE=ALLDATA2,INDNADIS=YES;`

8.4.3.2.7 Configure Secretary 2 in Node 400

Station 7462 is already configured as a normal station.

- Configure COS with GRPCAL for phantom station.

```
ADD-COSSU:NEWCOS=50,AVCE=FWDBAS&FWDECA&
FWDEXT&FWDNWK&FWDFAS&FWDDIR&MB&COSXCD&
TA&CDRSTN&CDRC&GRPCAL&TNOTCR;
```

- Configure phantom line for executive 1 at secretary 2.

```
ADD-SBCSU:STNO=7490,OPT=OPTI,CONN=DIR,
DVCFIG=OPTIIP,COS1=50,COS2=50,LCOSV1=5,
LCOSV2=5,LCOSD1=5,LCOSD2=5,DPLN=0,ITR=0,
COSX=0,REP=1,STD=26,SECR=N,IINS=SIGNOFF,
ALARMNO=0,CBKBMAX=5,TEXTSEL=GERMAN,HMUSIC=0,SERVID=0;
```

- Configure phantom line for executive 2 at secretary 2.

```
ADD-SBCSU:STNO=7491,OPT=OPTI,CONN=DIR,
DVCFIG=OPTIIP,COS1=13,COS2=13,LCOSV1=5,
LCOSV2=5,LCOSD1=5,LCOSD2=5,DPLN=0,ITR=0,
COSX=0,REP=1,STD=26,SECR=N,INS=SIGNOFF,
ALARMNO=0,CBKBMAX=5,TEXTSEL=GERMAN,HMUSIC=0,
SERVID=0;
```

- Mark prime line and phantom line at secretary 2 as team secretary.

```
CHANGE-SDAT:STNO=7462,TYPE=ATTRIBUT,AATTR=DSSDEST&
TEAMSECR;

CHANGE-SDAT:STNO=7490,TYPE=ATTRIBUT,AATTR=TEAMSECR;

CHANGE-SDAT:STNO=7491,TYPE=ATTRIBUT,AATTR=TEAMSECR;
```

- Secretary 2 CD 7462 is voice calling destination

```
CHANGE-SDAT:STNO=7462,TYPE=ATTRIBUT,AATTR=VC;
```

- Configure add-on device for secretary 2

```
CHANGE-SBCSU:STNO=7462,OPT=OPTI,REP=1;
```

- Define key assignments for secretary function.

```
CHANGE-TAPRO:STNO=7462,DIGTYP=OPTIA1,KY01=DSS,
KY02=RNGXFER,KY03=LINE,KY04=DSS,KY05=RNGXFER,
KY06=LINE,KY07=RCUTOFF,KY08=LINE,KY09=REP;
```

- Configure direct station selection destinations for secretary 2 to executive 1 and executive 2.

```
ADD-ZIELN:STNO=7462,TYPE=DSS,KYNO=20,DESTNOD=7261;

ADD-ZIELN:STNO=7462,TYPE=DSS,KYNO=23,DESTNOD=7461;
```

- Configure ring transfer destinations for secretary 1 to executive 1 and executive 2.

```
ADD-ZIELN:STNO=7462,TYPE=RNGXFER,KYNO=21,STNO1=7261,
STNO2=7490;

ADD-ZIELN:STNO=7462,TYPE=RNGXFER,KYNO=24,STNO1=7461,
```

```
STNO2=7491;
```

- Define delegate for secretary 2 is secretary 1.

```
ADD-ZIELN:STNO=7462,TYPE=REP,STNOREP=7362,STNOEX1=7461,
STNOEX1R=7391,STNOEX2=7261,STNOEX2R=7390;
```

- Configure secretary 2 as key set with phantom line for executive 1 and executive 2.

```
ADD-KCSU:STNO=7462,TYPE=PRIM,PRIMKEY=27,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,SGLBMOD=YES,BUSYRING=NORING;

ADD-KCSU:STNO=7490,TYPE=PRIM,PRIMKEY=22,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,SGLBMOD=YES,BUSYRING=NORING;

ADD-KCSU:STNO=7491,TYPE=PRIM,PRIMKEY=25,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,SGLBMOD=YES,BUSYRING=NORING;

ADD-KCSU:STNO=7462,TYPE=SEC,KYNO=22,STNOSEC=7490,
RIOP=YES;

ADD-KCSU:STNO=7462,TYPE=SEC,KYNO=25,STNOSEC=7491,
RIOP=YES;
```

- Connect prime line of executive 1 (node 200) with phantom line of secretary 2 and secretary 1 (node 300) via the network-wide call pickup.

```
ADD-AUN:GRNO=1,STNO=7490,REMAC=808902,REMGRNO=1,
DISTNO=NO,NOTRNG=ON3,PUSECOND=NO,SIGNAL=ALL;

ADD-AUN:GRNO=1,REMAC=808903,REMGRNO=1,REMSIGO=YES,
REMSIGI=YES,REMSIGPK=YES;
```

- Connect prime line of executive 2 (node 400) with phantom line of secretary 2 and secretary 1 (node 300) via the network-wide call pickup.

```
ADD-AUN:GRNO=2,STNO=7461&7491,REMAC=808903,
REMGRNO=2,DISTNO=NO,NOTRNG=ON3,PUSECOND=NO,
SIGNAL=ALL;
```

- Connect prime line of secretary 2 with prime line of secretary 1 via call pickup 3.

```
ADD-AUN:GRNO=3,STNO=7462,REMAC=808903,REMGRNO=3,
DISTNO=YES,NOTRNG=ON3,PUSECOND=NO,SIGNAL=ALL;
```

- Assign team number for DMS, unambiguous in the network.

```
CHANGE-AUN:TYPE=GR,GRNO=1,TEAMNO=1;

CHANGE-AUN:TYPE=GR,GRNO=2,TEAMNO=1;
```

- Give secretary 2 a name.

```
ADD-PERSI:TYPE=STN,STNO=7462,NAME="SECR 2";
```

- Give phantom line a name that appears during ring transfer.

```
ADD-PERSI:TYPE=STN,STNO=7490,NAME="SECR 2*";

ADD-PERSI:TYPE=STN,STNO=7491,NAME="SECR 2*";
```

- Only the name of the executive phantom line is displayed during ring transfer. The name is displayed independently of the station number display. This parameter applies system wide for all station devices.

  ```
  CHANGE-ZAND:TYPE=ALLDATA2,INDNADIS=YES;
  ```
- Save data.

  ```
  EXEC-UPDAT:BP,ALL;
  ```

8.5 Class of Service Switch-Over COSX

Each terminal port is assigned two classes of service (**COS**): one COS comprising basic classmarks (**COS1**), and one comprising alternative classmarks (**COS2**). When a terminal is placed in service, the COS pointer always points to COS1; these should be the higher-level classmarks. On switch-over to the alternative classmarks the user receives a special dial tone when he picks up the handset.

LCOSV (Least Cost Routing Voice) and **LCOSD** (Least Cost Routing Data) follow this same logic with **LCOSV1**/**LCOSV2** and **LCOSD1**/**LCOSD2**.

A COS contains all classmarks for all services. These are entered with the AMO COSSU. The COS is assigned to the port and hence to all connected devices. This includes service-specific classmarks for FAX and DTE. Attendant terminals are assigned only one COS (AMO ACSU), therefore, no class of service switch-over is provided. The same is true for trunk circuits.

Class of service switch-over can be activated:

- at the terminal
  - by inserting the ID card in the card reader. Inserting the ID card, however, will not change the position of the COS pointer, but result in the automatic assertion of COS1. When the ID card is inserted in a foreign device, and provided traffic (ITR) to the reader is allowed, COS1 of the user's home port will apply.
  - with a dialling procedure, provided both COSs of the user include code switch-over. The code number is assigned with the AMO PERSI. One port may be allocated several COSXCDs. The class-of-service switch-over code (COSXCD) to COS2 can be enabled for any user by setting the PERSI parameter **COSXCOS2**.
- from the attendant terminal
- from the service terminal with AMO BERUM
  - separately for each port
  - for a group of ports. This includes each port of a class-of-service-switch-over group (COSX group). There are 16 such groups. They are allocated with AMO SCSU / AMO SBCSU when the ports are set up. If the parameter is not provided, the port invariably belongs to COSX group 0. The AMO BERUM can be used for a selective switch-over to COS1, COS2 or to the currently inactive (alternative) COS.
- time-of-day-dependent; this always applies to entire COSX groups:

  The switch-over times are specified for each COSX group and week day by way of the AMO BERUZ. Each day of the week one time entry can be made for switch-over to COS1 and one for switch-over to COS2. An additional code character indicates for each COSX group and day of the week whether

or not switch-over should take place. This way time switch-over can be deactivated and reactivated temporarily without entering new time periods.

Key switch equipment is exempted from group switch-over. For equipment using several switch-over variants (code switch-over, group switch-over from the service terminal or from the attendant terminal, or time-dependent switch-over) the most recent switch-over is applicable.

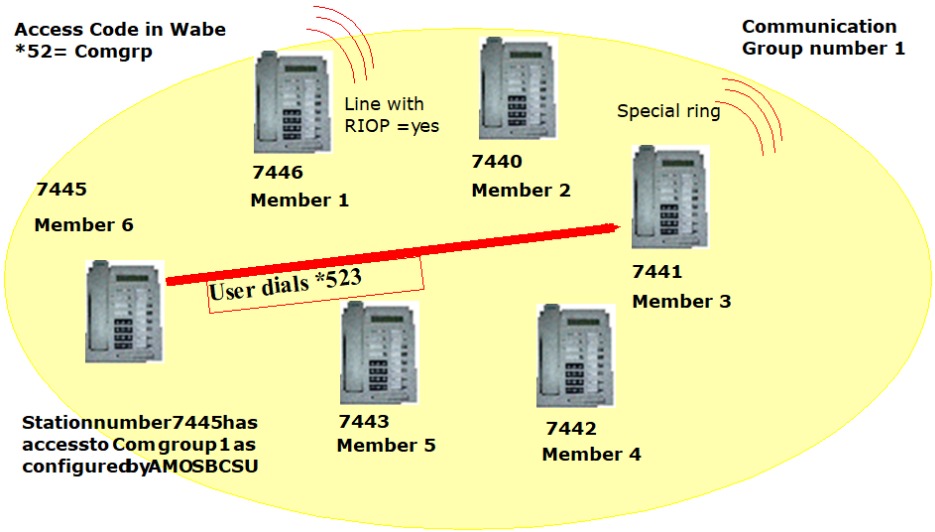
Exception:

If individual COS switch-over is to be allowed for COSX group members, the parameter **COSIND=Y** must be declared in the **ALLDATA2** branch of AMO ZAND. This will ensure that an individual switch-over will not be accidentally "reset" by a group or time-dependent switch-over. Individual COS switch-overs will then have to be revoked individually in each case.

8.6 COM Group Call

8.6.1 Feature Overview

The feature Com Group Calling allows internal short code and special ring cadences for users who are members of the same COM group.



8.6.2 Feature Description

A COM (community) Group Call allows Digital Feature Telephone (DFT) or Keyset users within a work group or same department to dial each other by using fewer digits than the full extension number, to establish a normal A to B connection. Call origination is based on the device that initiated the call, not the line used.

The COM Group Call feature will make it easy for a user to access a group (10 or 100 members) of stations in an abbreviated fashion. The user can, press a key (e.g., DDS w/access code), or dial an access code,or press a programmed

key(AMO TAPRO ,COMGRP) followed by a member number, to reach another station.

8.6.3 User Interface

The COM Group Call feature is involved with the initial establishment of a call. It allows 2 or 3 digit dialing to reach a destination party. The destination will then ring with special ringing which can be administered via AMO.

Additional user interface items:

- The user must answer the call via Hands-Free or by lifting the handset.
- Each station (device) (e.g., prime line, and phantom line) may be a member of one or more Groups and can appear once in each Group.
- A station (Keyset or DFT) has "access to" only one COM Group, but does not have to be a member of that COM Group.
- A COM Group station can be located in a remote node. This requires that each node have a duplicate database of the COM Group members to allow all members to call each other.
- NOTE: When the destination COM Group member resides in a different node than the calling party, the call is processed as a standard A <-> B call.
- Small COM Groups consist of up to 10 members (allows for two digit dialing (e.g., one digit access code followed by one digit member number[0-9])).
- Large COM Groups consist of up to 100 members (allows for three digit dialing (e.g., one digit access code followed by a two digit member number[00-99]).
- System can be configured for up to 1,024 COM Groups.

8.6.4 Service information

The COM Group Call feature is intended for the global marketplace.

8.6.5 Generation (Example)

How to add the COM Group feature into the system:

- Dimension the system for the number of COM Groups:
  ```
  ADD-DIMSU:TYPE=USER,COMGR=100;
  ```
- How to add stations into the COM Group:
  ```
  ADD-COMGR:STNO=7446,MBNO=1,GRNO=1,SIZE=S,INFO=TEST
   GROUP;
  ```
- How to change the special ringing at the destination device:
  ```
  CHA-ZAND:TYPE=RNGTYPE,COMGROUP=SGLR2;
  ```
- How to configure the originating station to have access to the COM Group:
  ```
  CHA-SBCSU:STNO=7445,COMGRP=1;
  ```
- Add the digits for dial access to the feature:
  ```
  ADD-WABE:CD=*52,DAR=COMGRP;
  ```
- Add the feature key to a phone:
  ```
  CHA-TAPRO:STNO=7445,KY05=COMGRP;
  ```

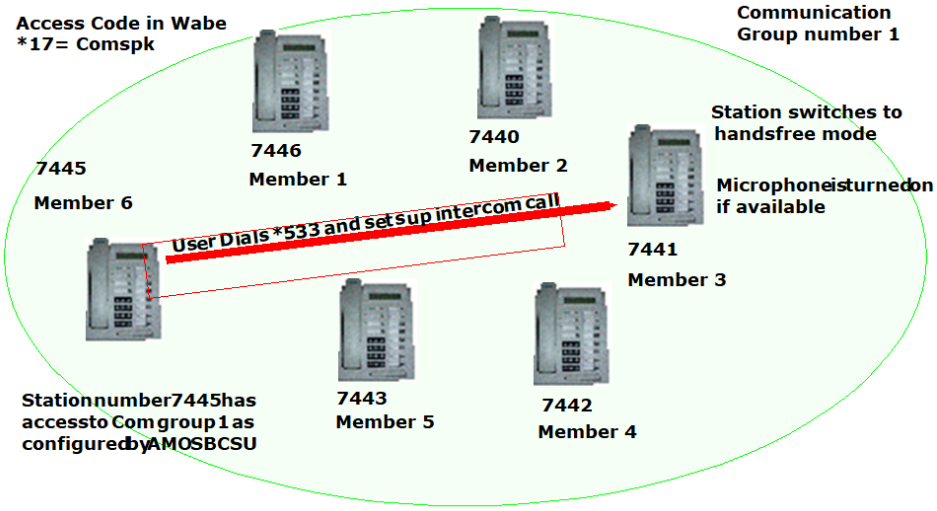
8.6.6 Relevant AMOs

AMO	Parameter	Language	Description
DIMSU	COMGR	d	anzahl der com gruppen
		e	Dimension the system for the number of COM Groups
COMGR	TLNNU	d	teilnehmer nummer
	STNO	e	station number
	MNU	d	mitgliedsnummer eines teilnehmer in einer com gruppe
	MBNO	e	member number of the station in the com group
	GRUNU	d	nummer der com gruppe
	GRNO	e	number of the com group
	GROESSE	d	groesse einer gruppe
	SIZE	e	size of the com group
	INFO	d	jede gruppe kann mit service informationen ergaenzt werden
		e	a service information may be added to each group
SBCSU	COMGRP	d	com group auf die der teilnehmer zugreifen kann
		e	com group the device is allowed to access
TAPRO	BROADCST		rundspruch
	BROADCST	e	speaker call - one way broadcast
WABE	BROADCST	d	rundspruch
	BROADCST	e	speaker call - one way broadcast
ZAND	RUFTYP= COMGRUP	d	Rufsignal fuer Comgruppe DOPPELRUF2, EINFACHRUF1, EINFACHRUF2
	RNGTYPE= COMGROUP	e	Used to supply special ring to the destination party

8.7 COM Group Speaker Call -Two-Way

8.7.1 Overview

This feature combines the existing voice call feature with the short code intercom feature to enable a fast easy to access intercom function.



8.7.2 Feature Description

The Digital Feature Telephone (DFT) or Keyset user is able to call and automatically activate and speak through the speaker of another DFT or Keyset in the same COM Group (a.k.a., an Intercom call). To make an Intercom call, the user depresses the Intercom key or dials an access code, and then dials the COM Group member number of the destination phone. The destination's speaker and microphone, if so equipped, are automatically activated.

8.7.3 User Interface

- Certain rules must be met when establishing a COM Group Speaker Call:
  1) The station user is not busy, not off-hook, not in hands-free operation, is not in program mode.
  2) The telephone is not marked for voice call protection.
  3) The station is not restricted from terminating to that destination (e.g. ITR Internal Traffic Restriction).
- The destination cannot be an analog telephone or attendant.
- If the destination telephone does not have a microphone, the handset must be lifted to establish the two-way conversation.
- The destination extension must appear in only one node. A destination extension can be a destination in a remote node. If so, the attempted call shall be converted to a standard two party call (A-B call).
- See COM Group Call for further information.

8.7.4 Generation (Example)

How to add the COM Group feature into the system:

- Dimension the system for the number of COM Groups:
  `ADD-DIMSU:TYPE=USER,COMGR=100;`
- How to add stations into the COM Group:

  ```
  ADD-COMGR:STNO=7441,MBNO=3,GRNO=1,SIZE=S,
  INFO=TEST GROUP;
  ```
- How to configure the originating station to have access to the COM Group:
  `CHA-SBCSU:STNO=7445,COMGRP=1;`
- Add the digits for dial access to the feature:
  `ADD-WABE:CD=*53,DAR=COMSPK;`
- Add the feature key to a phone:
  `CHA-TAPRO:STNO=7445,KY05=COMSPK;`
- How to configure the originating station to have access to the feature:

  `CHA-SDAT:STNO=7445,TYPE=ATTRIBUT,AATTR=COMSPK;`
- Change the length of time between periodic alert tone (warning beeps at the destination) during the speaker call:
  `CHA-DTIM1:TYPE=DIGITE,VCHAPAU=20;`

8.7.5 Relevant AMOs

AMO	Parameter	Language	Description
DIMSU	COMGR	d	anzahl der com gruppen
		e	Dimension the system for the number of COM Groups
COMGR	TLNNU	d	teilnehmer nummer
	STNO	e	station number
	MNU	d	mitgliedsnummer eines teilnehmer in einer com gruppe
	MBNO	e	member number of the station in the com group
	GRUNU	d	nummer der com gruppe
	GRNO	e	number of the com group
	GROESSE	d	groesse einer gruppe
	SIZE	e	size of the com group
	INFO	d	jede gruppe kann mit service informationen ergaenzt werden
		e	a service information may be added to each group
SBCSU	COMGRP	d	com group auf die der teilnehmer zugreifen kann

AMO	Parameter	Language	Description
		e	com group the device is allowed to access
TAPRO	COMSPK		gruppenteilnehmer ansprechen
		e	com group speaker call - two way
WABE	COMSPK	d	gruppenteilnehmer ansprechen
		e	com group speaker call - two way
DTIM1	DAPAUSE	d	pausenlaenge fuer aufmerksamkeitston bei direktansprechen
	VCHAPAU	e	pause length for alerting tone during voice calling
SDAT	COMSPK	d	direktansprechen/direktantworten
	COMSPK	e	com group speaker call - two way

8.8 Hunt Group

8.8.1 Feature Description

A hunt group incorporates several terminals which need to be reached under a common number. This number may be a code or the number of the first station of the hunt group. This first station is referred to as the master station.

The following seizure types are possible:

- cyclic

  The first available member rings. The search starts where the previous search ended.
- linear

  The first available member rings. The search starts with the first member.
- with parallel ringing

  Voice calls ring at all available members of the hunt group.

8.8.2 Service Information

Hunt groups can be formed for all service types, the hunt group code or master station number being service-neutral. The services are selected using a separate code number.

The call with the highest priority in the queue is assigned to the first group member who becomes available. The priority order within the queue is emergency call, CO call, tie call, internal call.

The previously queued call is presented to the next member who becomes available if it is still in ringing state, for example there is only one call ringing the group and not one call ringing member A and another call ringing member B.

A terminal can belong to several hunt groups. However, it cannot be master of more than one and cannot appear more than once in one and the same hunt group. For a voice hunt group, an overflow to a call queue can be established or a mailbox be added to the voice mail server in case all of a hunt group's stations are busy.

A functional terminal (ISDN terminal) requires the COS parameter **MULTRA** to ensure that all features work properly. However, when a functional terminal is configured in a hunt group, the COS parameter **MULTRA** may not be set. Otherwise the hunt group will not work properly and a CP Advisory message (CC:15295 / EC:2015) will be sent. Solution: Delete the **MULTRA** parameter for the affected terminal, then delete the hunt group, and set it up again.

A hunt group member station can be reached separately under its number or more or less randomly under the huntigroup code. The master station can only be reached as a hunt group member. It must always be the first station of a hunt group.

Attendant terminals cannot be integrated in a hunt group. They have to be accessed via the ATND group by dialing the **ATNDDID** or **ATND** group codes.

All group members can LOG ON to and LOG OFF from the group. An option can be configured to allow the last active member of the group to LOG OFF. The LOGON/LOGOFF operation is effective for all groups of which the phone is a member. The operation can be invoked by means of an access code or key or via the service menu.

Names can be assigned to all groups. The group name is presented to the calling party's display while the call is in the ringing state. An option can be configured to show the group name or the name of the group member who accepted the call in the connected state.

By specifying the **CPS** in AMO SA, availability of the hunt group can be restricted, for example, not available for DID or consultation hold. The DPLN group must be specified if the hunt group code has been added in the DPLN with a DPLN group branch.

Basically, a hunt group can be reached under several code numbers, for example, *80, and by replacing *, under 880. The hunt group must then be duplicated for each further code. This is very simple using the ADD command and the DUPL (duplicate) type branch. Changes made to such hunt groups apply to all code numbers.

The hunt group type "parallel" is only supported for voice (**STYPE=PRL** is rejected for **SVC=DTE/FAX**).

NOTICE:

In case of a parallel hunt group, the member status update is not supported. For example, if a member of a parallel hunt group is busy when a new call arrives in the hunt group and it becomes available again, the call will not be distributed or signalized at this member.

A hunt group with parallel ringing can have up to 20 members.

It is possible to assign virtual nodes (defined with KNDEF) to hunt groups in order to ensure correct number modification in complex E164 numbering environments.

8.8.3 Feature Interactions for Hunt Group with Parallel Ringing

- Call Forwarding

  All group members can activate **CFU** (Call Forwarding Unconditional). Incoming group calls routed to the group member follow the CFU. If the CFU destination is recognized as being a server, for example OpenScape Xpressions, then CFU is not followed and the member will not be rung for the group call.

  An option can be configured to consider any member with CFU active as being available, for example if the group option "busy if at least one member is busy" is chosen, then the group is not considered busy.

  UFIP that is not in service and is a Parallel Hunt Group member with CFU set in data base should allow CFU execution.

  The party forwarded to the device cannot LOG ON to or LOG OFF from the group on behalf of the forwarding member.

  The CFU settings of the master of a master hunt group control the CFU for the entire group, for example if the master has activated CFU, then all incoming group calls are routed to the CFU destination of the master. This also applies in case the master has activated CFU to a server, for example OpenScape Xpressions. This does not apply for a non master hunt group.

  CFNR (Call Forwarding on no Reply) and CFB (Call Forwarding Busy) settings for all group members are ignored for incoming group calls.

  Regular Call Forwarding processing applies for non group calls, for example if the extension number of the group member has been dialed by the call originator.

  Overview: **FOLFWBSY** and **BUSYCOND** if **CQMAX=0**:

  Call forwarding and hunt group with parallel ringing

FOLFWBSY	BUSYCOND	CFU Destination	Caller gets	Ringing Station
NO	ONE	free	free	HGM and CFU-DEST
NO	ONE	busy	free	HGM
NO	ALL	free	free	HGM and CFU-DEST
NO	ALL	busy	free	HGM
YES	ONE	free	free	HGM and CFU-DEST
YES	ONE	busy	busy	

FOLFWBSY	BUSYCOND	CFU Destination	Caller gets	Ringing Station
YES	ALL	free	free	HGM and CFU-DEST
YES	ALL	busy	free	HGM

- Do not Disturb

  All group members can activate do not disturb.

  Regular do not disturb processing applies for incoming group calls, for example calls are not routed to members with do not disturb active, etc.
- Outgoing Calls

  All group members can initiate outgoing calls while being rung for an incoming group call via either keypad dialing or use of a feature key (name key etc.).

  If the last ringing group member places an outgoing call, then the incoming group call is queued.
- Call Waiting

  Busy group members with call waiting active are alerted to an incoming group call by an audible and visible (if applicable) indication.

  Call waiting is not invoked if the group member decided to initiate an outbound call while the incoming call was ringing.
- Call Log

  Only answered calls are logged for the member who answered the call. There is no log for missed calls.

  For more information, see the Feature interaction section in OpenScape 4000 V10, Feature Description document.
- Pickup Group

  Only private calls to the hunt group members are signalled on all pickup group members. Calls to the master of a hunt group with parallel ringing are not signalled on other pickup group members

- Applications

  All members offer an incoming call to applications that have registered for the offered event. The call forwarding rules apply if the application deflects the call.

  CSTA support is offered only for the following scenarios:

  * Basic call to free PRL HG

  - call to PRL HG

  - all members ring

  - a member answers the call

  - the other members stop ringing

  * Basic call to busy PRL HG

  - call to PRL HG

  - first call is ringing at members

  - second call comes in and gets queued

  - a member answers the first call

  - the second call is signaled at the remaining free members

  * CFU and CFNR to free PRL HG

  * Speed extend to free PRL HG

  - attendant speed extend of incoming trunk call to HG with free members

  - a member answers the call

  - the other members stop ringing

  * External scenarios

  - internal PRL HG member has CFU to external member

  - call to PRL HG

  - all internal members ring

  - external member rings

  - internal member answers the call or external member answers the call

  - the other members stop ringing

  * Other scenarios may work, but are not explicitly supported
- Intercept to attendant

  If a DID call to a parallel group is intercepted, only the attendant station will ring regardless if the parallel intercept is set on the system.

8.8.4 Generation (Example)

- Proceed as follows to enable the feature:

  ```
  CHA-FEASU:TYPE=A,CM=HTVCE;
  ```

HTVCE	=	voice service

HTFAX	=	fax service
HTDTE	=	DTE service

- Assign a hunt group **DAR** in the DPLN:

  ADD-WABE:CD=key-num,**DAR=HUNT;**
- Assign **DAR** for deactivation of hunt group member (voice service):

  ADD-WABE:CD=key-num,**DAR=DHTVCE;**
- Assign DAR for reactivation of hunt group member (voice service):

  ADD-WABE:CD=key-num,**DAR=AHTVCE;**
- Assign a hunt group with linear device search (voice service):

  ADD-SA:TYPE=VCE,CD=number,**STYPE=LIN,**
  CQMAX=number;
- Assign a hunt group with cyclic device search:

  ADD-SA:TYPE=VCE,CD=number,**STYPE=CYC,**
  CQMAX=number;
- Assign a hunt group with parallel ringing (voice service):

  ADD-SA:TYPE=VCE,CD=number,**STYPE=PRL,**
  CQMAX=number;
- Create a master hunt group with the STNO 2103, service = voice, stations 2100-2101, STYPE=LIN with call queue capacity of 20 stations.

  ADD-SA:**TYPE=VCE,CD=2103,**DPLN=0,
  STNO=2100&2101,STYPE=LIN,CQMAX=20;

  IMPORTANT: A maximum of 10 users can be added with one command. If a larger hunt group is required, the command ADD-SA:TYPE=STN; can be used to expand the hunt group by an additional 10 users: This applies to all services. In addition, the parameter POS can be used to specify the position in the hunt group at which the station is to be included.
- Duplicate the hunt group having STNO *21 at *3.

  ADD-SA:TYPE=DUPL,CDOLD=*21,CDNEW=*3;
- To ensure that every station in a hunt group can receive a new call as soon as it becomes available, use the following command to create a pool:

  ADD-DIMSU:**HGMEMB**=<minimum number of local hunt group stations>;
- Call forwarding in a hunt group
  - **LVAFTEXT=N, EXECCFW** - no effect

```
ADD-SA:TYPE=VCE,CD=number,STYPE=<CYC or
 LIN>,LVAFTEXT=N;
```

If a hunt group is to be set up with external (non-local) stations, set the parameter **LVAFTEXT=NO**. Only then can all stations in the hunt group be reached (even when external stations have been set up in the hunt group). The hunt group will not be exited. If call forwarding has been set up by subscribers, it will not be carried out.

– **LVAFTEXT=Y, EXECCFW=Y**

If external stations have been set up in the hunt group, they can be reached, but that results in them leaving the hunt group. Call forwarding set up by subscribers in the hunt group will be carried out, but will also result in them leaving the hunt group.

```
ADD-SA:TYPE=VCE,CD=number,STYPE=<CYC or
 LIN>,LVAFTEXT=Y,EXECCFW=Y;
```

– **LVAFTEXT=Y, EXECCFW=N**

External stations may not be configured for the hunt group. With this setting, external stations cannot be reached. The hunt group will not be exited. If call forwarding has been set up by subscribers in the hunt group, it will not be carried out.

```
ADD-SA:TYPE=VCE,CD=number,STYPE=<CYC or
 LIN>,LVAFTEXT=N,EXECCFW=Y;
```

IMPORTANT: The parameters **EXECCFW** and **LVAFTEXT** are only relevant for members of a hunt group. For the master station of a hunt group with call forwarding configured, signaling always occurs regardless of the settings of the two parameters. **EXECCFW** and **LVAFTEXT** do not have any effect for hunt groups with parallel ringing.

- Allow last hunt group member to leave the group

  This feature can be activated in two steps.

  1) The feature can be activated globally (in the whole system) with AMO ZAND, parameter **DISCLHNT**.

  ```
  CHANGE-ZAND:TYPE=ALLDATA2,DISCLHNT=YES;
  ```

  2) The feature can be activated for one hunt group only with AMO SA, parameter **LSTMBOFF**.

  ```
  CHANGE-SA:TYPE=TYPE,CD=<hunting_group_access_code>,
  SVC=<device service>,LSTMBOFF=YES;
  ```

  If a member is configured in more than one hunt group, the member is allowed to log off last only if the parameter **LSTMBOFF** is set in all affected hunt groups.

8.8.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
DIMSU	SATLN	d	Anzahl der Endgeräte, die Mitglieder eines Sammelanschlusses (auch netzweiter Sammelanschlüsse) sind
	HGMEMB	e	Number of stations that are members of a hunt group (also network-wide hunt groups)
FEASU	LM	d	SAS = Dienst Sprache SAF = Dienst FAX SAD = Dienst DEE
	CM	e	HTVCE = voice service HTFAX = fax service HTDTE = DTE service
SA	TYP	d	Sammelanschlussoption
	TYPE	e	Hunt group option
	ART	d	Suchart
	STYPE	e	Search type
	ANOKAP	d	Anrufsortierungs-/ Warteschlangenkapazität Wenn der Parameter **VARAO** auf **JA** gesetzt ist, wird die Anzahl der Anrufwarteschlangen automatisch bestimmt und der Parameter **ANOKAP** ignoriert.
	CQMAX	e	Call ordering/queuing capacity If the parameter **VARCQ** is set to **Y**, the number of call queues will be determined automatically and the parameter **CQMAX** will be ignored.
	VERLNEXT	d	Sammelanschluss nach Netzwerkmitglied verlassen
	LVAFTEXT	e	Leave hunt group after networking member
	AUSFAUL	d	Anrufumleitung von Sammelanschlüssen ausführen
	EXECCFW	e	Execute call forwarding from hunt groups

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	ABMLDLZT	d	JA: Das letzte Mitglied einer Sammelanschlussgruppe kann sich beim Sammelanschluss abmelden (gilt für einen einzelnen Sammelanschluss).
	LSTMBOFF	e	YES: Last member of a hunt group is allowed to leave the hunt group (only valid for one hunt group).
	BUSYCOND	d	Besetzt Bedingung des Parallel Ringing Sammelanschlusses. Werden bei ART=ZYK/LIN ignoriert.
	BUSYCOND	e	Busy condition of the parallel ringing hunt group. Will be ignored for STYPE=CYC/LIN.
	FOLFWBSY	d	Umgeleiteten Ruf folgen um besetz Status zu bestimmen. Werden bei STYPE=CYC/LIN ignoriert.
	FOLFWBSY	e	Follow forwarded to determine busy status. Will be ignored for STYPE=CYC/LIN.
	ANZART	d	Art der Nebenstellennummernanzeige an einer Nebenstelle. Wird bei ART=ZYK/LIN ignoriert.
	DISPTYPE	e	Type of station number display at a station. Will be ignored for STYPE=CYC/LIN.
WABE	KZP	d	SAMMEL = Sammelanschluss DHTVCE = Zuweisung des Endgeräts zum Sammelanschluss Sprache aufheben AHTVCE = Endgerät zum Sammelanschluss Sprache hinzufügen
	DAR	e	HUNT = Hunt group DHTVCE = Disassociate station from hunt group voice AHTVCE = Add station to hunt group voice
ZAND	AUSLSA	d	JA: Das letzte Mitglied einer Sammelanschlussgruppe kann sich beim Sammelanschluss abmelden (gilt für das gesamte System).

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	DISCLHNT	e	YES: Last member of a hunt group is allowed to leave the hunt group (valid for the whole system).

8.8.6 Stimulus display phones (Optiset, Optipoint, lower Openstage versions, CP200) configured as master

If the called station number is the same with the hunt group number (as it is in case of master hunt group), then the hunt group information (number and name) is not displayed.

8.9 Hunt Group Network-wide

Hunting group destinations which can be reached internally, externally, or network wide are treated as call forwarding destinations, provided the hunt group parameter "Call forwarding for hunting group stations" (AMO SA) has been activated.

Call forwarding can be performed several times in sequence, for example, renewed call forwarding, call forwarding - no answer after a timeout or call forwarding busy, etc., under the same conditions as those for "normal" station multiple call forwarding.

For even load distribution within a network, you can configure a hunting group with network-wide stations. To achieve even load distribution in a cyclical hunting group allow every second hunting group station to activate call forwarding to another hunting group within the network.

LVAFTEXT Parameter

The parameter **LVAFTEXT** (leave hunt group after netw. member) makes it possible to maintain control in the hunting group when calls are distributed to external numbers (in other words, whether the hunting group should be left or not).

- LVAFTEXT=Y

  When a call to a hunting group arrives at an external number or forwarded number, the call leaves the hunting group. The hunting group then no longer controls this call.
- LVAFTEXT=N

  When a call is distributed within a hunting group, the system also checks for external numbers. The network-wide station is handled in the same way

as an internal station. The hunting group maintains control in this case. Call forwarding (any type) is not performed when LVAFTEXT=N.

The following hunting group sequence is possible for example: internal station -> network-wide station -> internal station.

External subscribers can also be configured as hunting group stations. If the station does not answer, the call is redirected within the hunting group.

If no pool has been configured in AMO DIMSU (see below) for systems including hunting group stations, there may be delays in recognizing when hunting group stations are free.

This is especially true for external stations.

8.9.1 Expansion of the Call Queue Overflow Function

AMO SA permit input of a station number with up to 22 digits as an overflow destination. This means that all internal, external, and network-wide stations can be configured as overflow destinations. An overflow to a PhoneMail via S2 connection functions like an overflow to a network-wide VMS. The mailbox number is limited to 7 digits.

- Possible overflow destinations
  - none
  - station number
  - network-wide VMS
  - PhoneMail
- Station number for overflow destinations
  - station number (1 - 22 digits for station numbers)
  - station number (1 - 7 digits for VMS/PhoneMail destinations)

  If a network-wide VMS or PhoneMail number is entered, the entry in the VMX table (for network-wide VMS) or the SAN table (for PhoneMail) is the server station number. Mailbox station number output is similar to that of the internal VMS.

  Any calls to a hunting group during call queue overflow are treated as call forwarding to a hunting group station: after call forwarding by overflow a 'ring no answer or when busy' cannot be performed. Several call forwardings can only be performed if multiple call forwarding has been activated in the destination node (currently up to 10 levels).

  The only exception is when another hunting group is specified as the overflow destination. In this case, FNA (Forward If No Answer) is performed within the hunting group. The system will consider this hunting group's overflow destination, which can be an internal or network-wide station number, provided multiple call forwarding was activated in this node. The overflow destination can again be a hunting group. As call processing cannot check the number of network-wide hunting group links, the provider is responsible for their limitation. If the second hunting group's overflow destination is a VMS or PhoneMail number, call forwarding is always performed, even if multiple call forwarding has not been activated. This

occurs regardless of whether the VMS or PhoneMail number is a network-wide or internal number.

To distribute the traffic load evenly in the network, configure another hunting group in a second PABX as the overflow destination. This distributes the busy hour loads caused by call queue overflow.

A hunting group station can configure a FWD destination. The usual tests to check the validity of the FWD destination are performed. No further checks for the validity of the FWD destinations are required.

The overflow destination is configured using an AMO (=FWD destination). The AMO first checks whether the specified station number leads to a valid DAR. In other words, this eliminates incomplete (INCO) or impossible (NOPO) station numbers (only limited use for network-wide or external station numbers).

If a call to a hunting group is forwarded to an external or network destination, then the call will not be forwarded within the originally called hunting group if the overflow destination does not answer or is busy. Optical camp-on by the

call queue and the overflow destination is not used, as stations with active call forwarding to network or external station numbers are treated as free.

Call forwarding destinations can only be checked if the destination is an internal station number. Forwarding to other station numbers cannot be checked.

After call forwarding or if the station is located in another PABX, callers may only hear the busy tone if the destination is busy or the required resources (lines, paths) are currently unavailable.

Stations in different PABXs can be configured as hunting group members.

All station numbers which can be dialed internally, externally, and network wide and all internal and network-wide VMS and PhoneMail numbers can now be configured as overflow destinations.

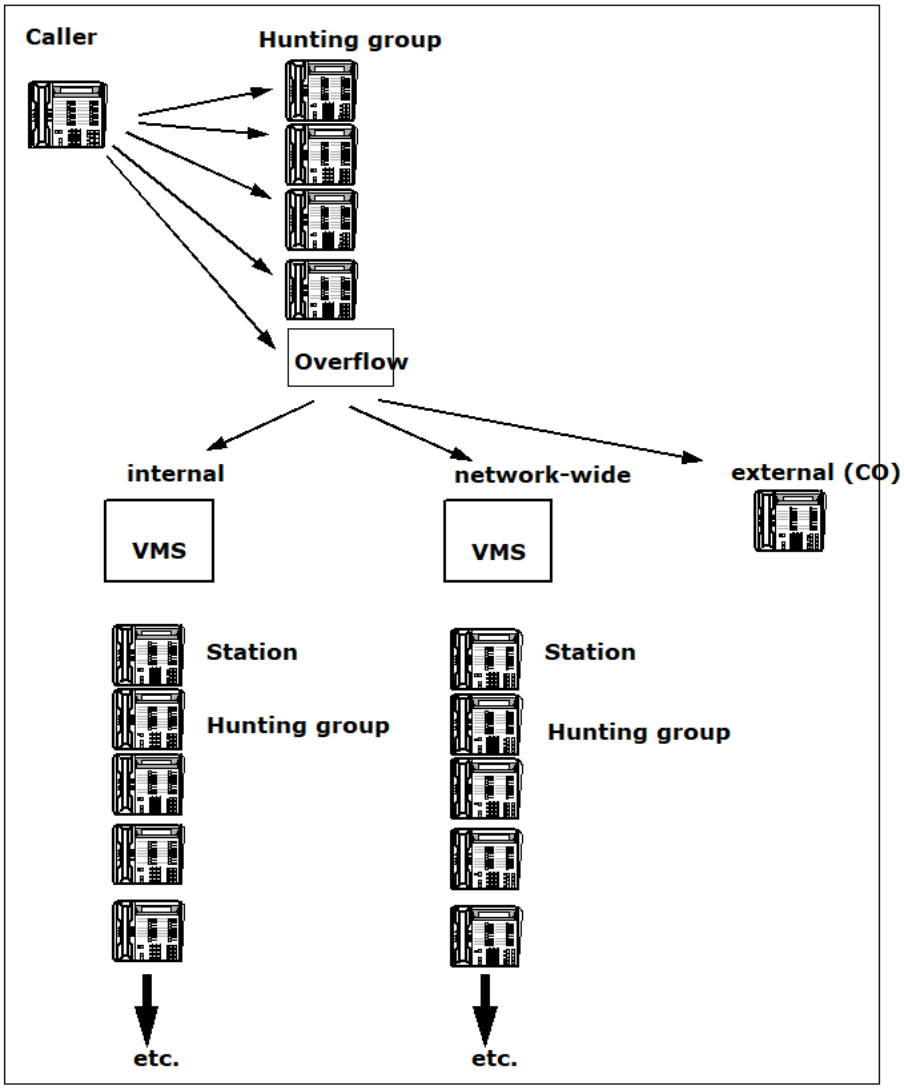


Figure 92: HG Overflow Destinations

8.9.2 Generation

The FWD COUNTER in AMO ZAND is used to configure the maximum number of call forwardings.

- Activate the feature
  `CHA-FEASU:TYPE=A,CM=HTNW;`
- Configure a hunting group with call forwarding
  `ADD-SA:TYPE=VCE,CD=<hunting group station number>,STNO=<station numbers of hunting group station>,STYPE=<(LIN or CYC)>,LVAFTEXT=Y,EXECCFW=Y;`
- Configure a hunting group in which call diversion is not allowed, but in which network-wide stations in the hunting group can be reached
  `ADD-SA:TYPE=VCE,CD=<hunting group station number>,STNO=<station numbers of hunting group stations>,STYPE=<(LIN or CYC)>,EXECCFW=Y;LVAFTEXT=N,`
- Configure the maximum number of call forwardings
  `CHA-ZAND:TYPE=ALLDATA2,FWDMAX=<number of call forwardings>;`
- Configure call forwarding
  `ADD-ZIEL:TYPE=FWD,SRCNO=<forwarding party>,SI=VOICE,DESTNOF=forwarding destination;`
- Activate call forwarding
  `ADD-ACTDA:TYPE=STN,STNO=<forwarding party>,FEATCD=FWD,SIFWD=VOICE;`

  The number of a hunting group's overflow destinations has been increased. Now an internal VMS (in the local PABX), a network-wide VMS, a PhoneMail server, and a station number (optionally in the local PABX, in a network PABX, or in the CO) is allowed. Overflow to the servers is performed whether or not the FWD COUNTER in AMO ZAND is reached. The FWD COUNTER limits the overflow to the station number.
- Configure a hunting group with overflow
  `ADD-SA:TYPE=VCE,CD=<hunting group station number>,STNO=<station numbers of hunting group stations>,STYPE=<(LIN or CYC)>,OVFLDEST=<(PHONMAIL,VMSNW,DESTEXT,NONE)>,NUMBER=<station number>;`

  The overflow destination can be reached after a call has spent a cycle in the hunting group. The OVFLCYCL parameter is set to Y for this.
- Configure a hunting group with overflow and overflow after one cycle
  `ADD-SA:TYPE=VCE,CD=<hunting group station number>,STNO=<station numbers of hunting group stations>,STYPE=<(LIN or CYC)>,OVFLCYCL=Y,OVFLDEST=<(PHONMAIL,VMSNW,VMSINT,DESTEXT,NONE)>,NUMBER=<station number>;`

  Configure a pool for detecting free or busy stations
  `ADD-DIMSU:TYPE=USER,HGMEMB=<number of configured hunting group stations>;`

  If the LVAFTEXT parameter in the AMO SA is set to N, you must also configure a pool in all systems that feature a network-wide hunting group station.

8.9.3 Example

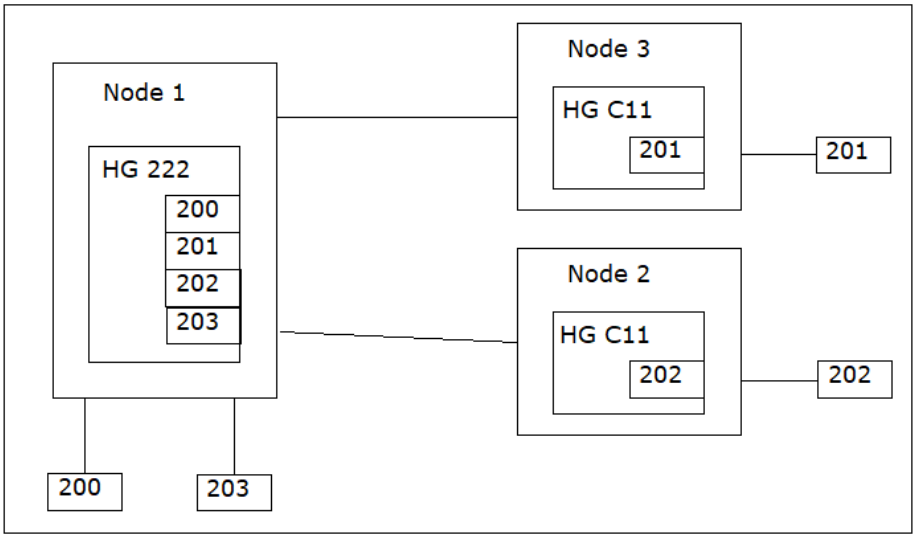


Figure 93: Hunting group, network wide: Example

Generating node 1:

The actual hunting group with internal and external stations is configured in this node.The feature will only work if LVAFTEXT is set to N!

```
CHA-FEASU:TYPE=A,CM=HTNW;

ADD-DIMSU:TYPE=USER,HGMEMB=<number of configured
hunting group stations>;

ADD-SA:TYPE=VCE,CD=222,STNO=200&201&202&203,
STYPE=LIN,CQMAX=0,LVAFTEXT=N;

CHANGE-TAPRO:STNO=200,KY12=HT;

CHANGE-TAPRO:STNO=202,KY12=HT;

CHANGE-ZAND:TYPE=ALLDATA2,DISCLHNT=YES;
```

Generating nodes 2 and 3:

An additional fictitious hunting group is configured in nodes 2 and 3 (in this case, it has the number "C11", which cannot be dialed). The fictitious can be either DAR HUNT or a floating (FLOAT) station as the head station to allow the HG button to function (meaning the station can leave the hunting group using the HG button). Furthermore with this configuration, the external stations (201, 202) are merely members and not masters of the hunting group i.e. as a result, there are no restrictions on these stations when they are called directly (for example, callback).

Set the DISCLHNT parameter to YES so that the external stations can leave the hunting group.

Generating node 2:

```
CHA-FEASU:TYPE=A,CM=HTNW;

ADD-DIMSU:TYPE=USER,HGMEMB=<number of configured
hunting group stations>;

ADD-WABE:CD=C11,DAR=HUNT,CHECK=N;

ADD-SA:TYPE=VCE,CD=C11,STNO=201,STYPE=CYC,CQMAX=0,
LSTMBOFF=Y;

CHANGE-TAPRO:STNO=201,KY12=HT;

CHANGE-ZAND:TYPE=ALLDATA2,DISCLHNT=YES;
```

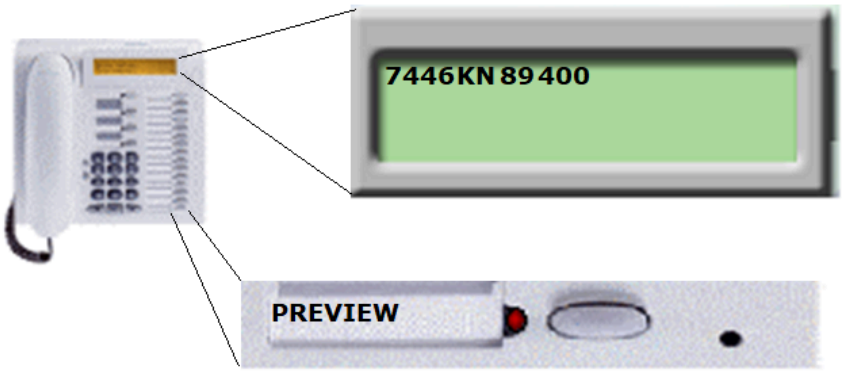
Generating node 3:

```
CHA-FEASU:TYPE=A,CM=HTNW;

ADD-DIMSU:TYPE=USER,HGMEMB=<number of configured
hunting group stations>;

ADD-WABE:CD=C11,DAR=HUNT,CHECK=N;

ADD-SA:TYPE=VCE,CD=C11,STNO=202,STYPE=CYC,CQMAX=0,
LSTMBOFF=Y;

CHANGE-TAPRO:STNO=202,KY12=HT;

CHANGE-ZAND:TYPE=ALLDATA2,DISCLHNT=YES;
```

8.10 Keyset Preview Key

8.10.1 Overview

The Preview feature allows the users of multi-line keysets to view caller i.d. information about certain lines.



PressingthePreviewKeyandanylineallowsthecallerI.Dofthatlinetobedisplayed

8.10.2 Feature Description

The Preview key is typically used on a keyset with multiple lines. By depressing the Preview key, the keyset user can see display information associated with certain lines on the keyset, without requiring the user to answer the call or to take the line off of hold.This "previewing" can be done while the user is active on a call or while the keyset is idle, as follows:

- A keyset user can preview ringing (audible) lines, for those lines that are configured to ring.
- A keyset user can preview lines on Manual Hold.
- A keyset user can preview lines that he/she has placed on Exclusive Hold.
- A keyset user can preview the currently active keyset line, (s)he is using, to show the identity of the other user and, when a call is camped-on, to show the identity of the camped-on caller.
- A keyset user can preview ringing (audible) lines which are recalling, i.e., from hold, park, system hold, and transfer.

An attempt to preview any lines not meeting the above criteria will give a timed "CURRENTLY NOT AVAILABLE" display.

8.10.3 User Interface

Activation Sequences

1) Previewing a ringing line

- If IDLE or TALK or CONFERENCE -

  a) Press PREVIEW Key and the PREVIEW LED comes on
  b) Press a ringing line and calling information is displayed for a programmed amount of time (Preview-Display timer = 8 seconds default).
  c) To preview another line, press the LINE key of the line to be previewed.
  d) To answer a line which is being previewed (preview display information is active), press the line key again or go off-hook if previewing from idle state.

2) Previewing a line on hold

- If IDLE or TALK or CONFERENCE -

  a) Press PREVIEW Key and the PREVIEW LED comes on
  b) Press a manually held line and held party information is displayed for a programmed amount of time (Preview-Display timer = 8 seconds default).
  c) To preview another line, press the LINE key of the line to be previewed.
  d) To answer a line which is being previewed (preview display information is active), press the line key again or go off-hook if previewing from idle state.

3) Previewing a line you are active on

- While in TALK

  a) Press PREVIEW Key and the PREVIEW LED comes on

  b) Press the line you are active on and connected party information is displayed for a programmed amount of time (Preview-Display timer = 8 seconds default).

  c) To preview another line, press the LINE key of the line to be previewed.

  d) To answer a different line which is being previewed (preview display information is active), press the line key again.

4) Previewing a non-ringing (alerting) or non-manual held line other than the line you are active on.

- While in TALK or CONFERENCE

  a) Press PREVIEW Key and the PREVIEW LED comes on

  b) Press the non-ringing/alerting line and Preview of line, Currently not possible is displayed for a programmed amount of time (Preview-Display timer = 8 seconds default).

  c) To preview another line, press the LINE key of the line to be previewed.

5) Previewing an idle line.

- While in TALK or CONFERENCE

  a) Press PREVIEW Key and the PREVIEW LED comes on

  b) Press an idle line and PRESELECTED is displayed for a programmed amount of time (Preview-Display timer = 8 seconds default).

  c) To select the idle line, press the same LINE key while preview display is active. Note: If the user is active on another line, disconnect and automatic hold rules for line keys shall be honored.

  d) To preview another line, press the LINE key of the line to be previewed.

Deactivation Sequences

1) A keyset user must deactivate preview mode prior to answering a call (line).

2) Time-out: There is no time-out for preview "mode".

3) Pressing any key other than a line key after pressing the Preview key.

4) User going off hook while the keyset is idle (with or without any line appearances on hold) will deactivate preview mode and, if preview display information is present for a line, will select that line.

5) User going on hook, e.g., to terminate existing call or to go to hands-free operation.

Feature Interactions

1) Upon deactivation, the preview function ceases and the Preview key LED is deactivated.

2) Upon deactivation or after time-out of the display of the previewed information, the following shall be displayed, dependent upon priority:

- **a)** Elapsed Time display will be displayed.
- **b)** Dialog options (e.g., feature prompts) for TDM telephones will be displayed.
- **c)** Pending call information will be displayed.
- **d)** Displays during idle state, e.g. time and date.

3) A user selection of another feature or function other than a line key for preview, shall overwrite active line preview information display, in response to the user.

4) Upon initialization or re-initialization of the telephone.

8.10.4 Service Information

The Preview feature is intended for the global marketplace.

8.10.5 Generation (Example)

To add the preview key to an Optipoint telephone
`CHANGE-TAPRO:STNO=7446,DIGTYP=OPTIT19,KY19=PREVIEW;`

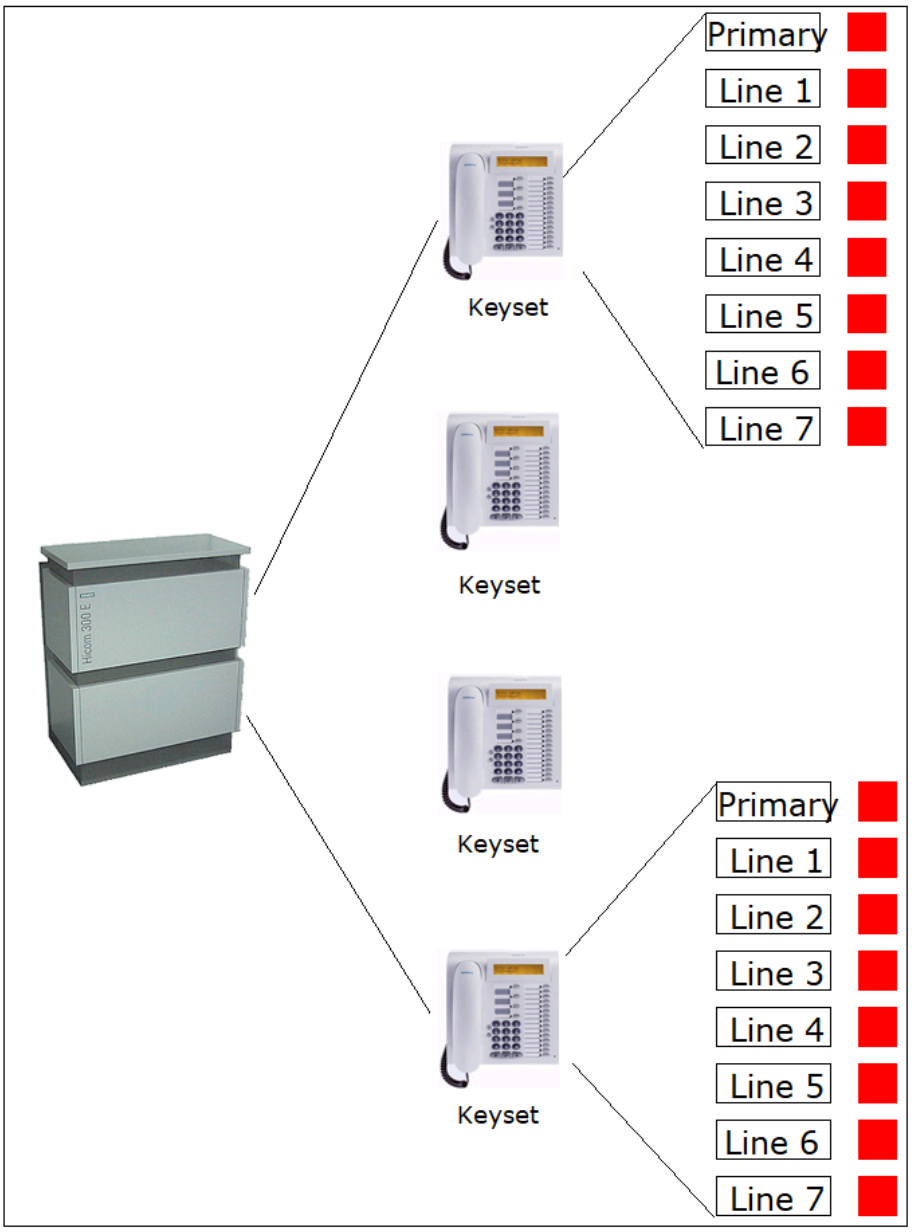
To increace the timer for the preview function
`CHANGE-DTIM1:TYPEDH=DIGITE,CTPRESEL=20;`

8.10.6 Relevant AMOs

AMO	Parameter	Language	Description
TAPRO	TDnn	d	Die neue Taste (nn) heißt PREVIEW
TAPRO	KYnn	e	The new key (nn) is called PREVIEW
DTIM1	DIGITE	d	Über den Parameter KPDRESEL wird die Dauer der PREVIEW-Anzeige festgelegt.
DTIM1	DIGITE	e	Parameter CTPRESEL is used to set the PREVIEW display duration

8.11 Integrated Key Functionality / Multi Line Access

The feature functions are similar to team systems or multi-line key telephone systems.



- Max. 28 lines per terminal.
- Max. 40 terminals per line.
- Functional on all optiPoint 410 and optiPoint IP.
- Line status display by LED.
- Not allowed with the executive/secretary feature.

8.11.1 Feature Description

Multi-line access can only be activated by terminals which have been specially configured using AMO KCSU. Terminals configured for this purpose will be referred to as Keysets in this document.

Multi-line access allows seizure of a primary line (initial line) and up to 28 secondary lines from a Keyset for incoming and outgoing calls. Every line

corresponds to a station number. One line can be assigned to as many as 40 different terminals. For every line there is a line key with LED on the terminal. The LED signals the line state. Free: LED is off, seized: LED is on, call state: LED flashes rapidly, call on hold: LED flashes slowly.

8.11.1.1 Brief Description of Keyset Features

- Every Keyset has an initial or primary line which is reached via the main station number. This line can be assigned to other Keysets as secondary line.
- A phantom line is assigned to other terminals as a secondary line and is not assigned to any terminal as a primary line. A phantom line is configured as a logged-off Keyset, i.e once the phantom line is configured (SBCSU:ins=signoff) it must be added as a prime line in KCSU to enable it to be added as a secondary line on other Keysets.
- Call: Every line can be configured to be either a line with, or without, ringing (KCSU, RIOP parameter). Ringing tone is activated as soon as a call is signalled on one of the lines for which ringing has been configured for this particular station. The LED of the line key flashes. Several simultaneous calls are signalled in the order of their arrival. Different ringing can be set for all line keys for which the ringing tone has been programmed. If the ringing tone cannot be injected because the Keyset is busy an alerting tone is activated (if configured, KCSU, BUSYRING parameter).
- In case of a Keyset, all parallel ringing features (pick-up group with GRPCAL, ONS group, parallel hunt group etc) use exclusive ringing for the called line, i.e. only the device that has that line defined as primary will ring.
- Line selection: Automatic and manual line selection is available.
  - With automatic line selection one of the configured lines is automatically seized as soon as the user goes off-hook to initiate or answer a call. Several options can be set defining the preferences of outgoing and incoming connections.
    - Depending on the configured option either the primary line (KCSU, ORLNPF=PRIME), the last used line (KCSU, ORLNPF=LAST), any free line (KCSU; ORLNPF=IDLE) or no line (KCSU; ORLNPF=NONE --> manual selection required) is seized for outgoing connections.
    - Depending on the configured option, either a calling line (KCSU; TMLNPF=RING), any incoming line (the calling lines are queried first, followed by lines not set for ringing, on a FIFO basis. KCSU; TMLNPF=ALER) or no line (KCSU; TMLNPF=NONE) is selected for incoming connections. Calls on the primary line can be set to be answered with priority regardless of the time of their arrival (KCSU; TMLNPF=RINGP or ALERP).
- Using manual line selection a user can bypass the automatic line selection by pressing a line key before going off-hook. The options: single key mode, preselection mode or subsequent line selection can be configured.
  - In single key mode (KCSU; SGLBMOD= YES) the line is selected by pressing a line key. The Keyset is switched to hands-free mode with on-hook handset.
  - In preselection mode (KCSU; SGLBMOD=NO) the line key is pressed in idle state and the required line is preselected as soon as the user goes off-hook, presses either the loudspeaker, name, DSS or number redial keys or enters dialing digits. The preselection is valid for 10 seconds

(configurable via AMO). If a line with ringing has been configured, the calling party is displayed when the line key is pressed until the preselection time expires. After preselection the incoming call can be received on the preselected line by going off-hook.

– Subsequent line selection. The user lifts the handset and presses a line key to subsequently choose or change the line to be used.

- Classes of service: Calls can be initiated using any line on any terminal. Depending on the system configuration, the line COS or the COS of the Keyset is used (AMO ZAND, COSLNBAS parameter). There are, however, features which always use the COS assigned to the used terminal or the used line.
- Display: During the call, and after answering a call, the display of the called party normally displays <Station number and name> of the primary line of the calling station or the used line, depending on the system configuration (AMO ZAND, DISLNBAS parameter). The key also affects the display of the calling party after the B party answers.
- General and exclusive hold. Hold allows a user to hold a connection and then to go on-hook or to initiate or answer a call on a different line without losing the held connection. Only two-party calls can be held. Holding of consultation calls is not possible.

  – If general hold is set, the held connection can be picked up by all Keysets where the respective line is assigned (the LED flashes slowly on those stations) by pressing the line key.
  – If exclusive hold is set, the held connection can only be resumed by the Keyset which put the line on hold (the LED flashes slowly only on this station) by pressing the line key.

  There are three ways to put a line on hold: by pressing either the "Hold" or "Exclusive hold" keys or by selection from the dialog menu. Changing to another line or pressing the line key of the current line also puts a line on hold (or releases it, depending on the system configuration, AMO ZAND, HDNOACKY parameter).

  If exclusive hold is set, the Keyset which put the line on hold receives a recall with priority, if the held line is not resumed after the timeout. If general hold is set, a recall is signalled at all Keysets where the line is assigned.
- Multiple consultation. A user with several assigned lines can initiate a three-party conference by pressing the line key of the line he wishes to override. A three-party conference is established, if a two-party call (A-B) is active on the selected line and no private call has been initiated. Conference tone is injected at all three parties (A, B, C) if multiple consultation is activated. Only one station can enter into an existing connection.
- Private call. This feature protects the Keyset user against multiple consultation by another Keyset user. Automatic and manual private calls are possible. Automatic private call (configured using AMO KCSU, APRIVAT=YES) is activated as soon as a call is initiated. Keysets without the automatic private call feature are protected for one connection by activating the feature manually.
- Display of seized line. The line currently seized or selected by the Keyset is displayed, as soon as the handset is lifted. Automatic display of the currently seized line is activated as soon as a line is selected. The currently used line can be queried manually in various states via the function key "I-USE" or selection of the menu "Show seized line?" in the service menu.
- **Ringer cut off.** The user can deactivate ringing at the Keyset by pressing the "Idle" key or selecting "Switch off ringing?" in the service menu. The LED

of the corresponding function key is "on" if this feature is activated. Incoming calls are only signalled optically by the flashing LED on the line key(s). All incoming calls are signalled at their required destination, but only visually (LED, display). They can be answered as usual. Some call types override Idle, e.g. exclusive calls, ACD.

8.11.1.2 Display of incoming calls on secondary lines of a keysystem

8.11.1.2.1 Feature Description

If a station is a keysystem and it has several secondary lines configured on it, then all the incoming calls to any of those keysets who have appearances on the device must be signaled by the line led blinking (actual behaviour) and **also** on the display, indicating who the caller is and which the line number called is.

8.11.1.2.2 Generation

```
CHANGE-ZAND:TYPE=KEYSYS,DSAALINC=YES;
```

Configuration example:

Station A no. 1000 - keyset

Station B no. 1001 - keyset

Station C no 1002 - optiPoint 410, Anate, ...

Station A has on the key no.5 a secondary line of B configured.

When C dials the number of B, this call should by signaled on A, by the blinking led (no.5) and by displaying "1002 C -> 1001 B ". (Name and number of the parties, if available)

The display of A must remain active for 10 seconds and return to the previous display after time-out, if the call is not answered nor dropped during this time.

If B answers the call before the 10 seconds timer expires, then the display of A must be refreshed and changed back to the display before.

If C goes on-hook (drops the call) before B answers, then the display of A must be switched back to the previous display. (the one before the call to B occurred).

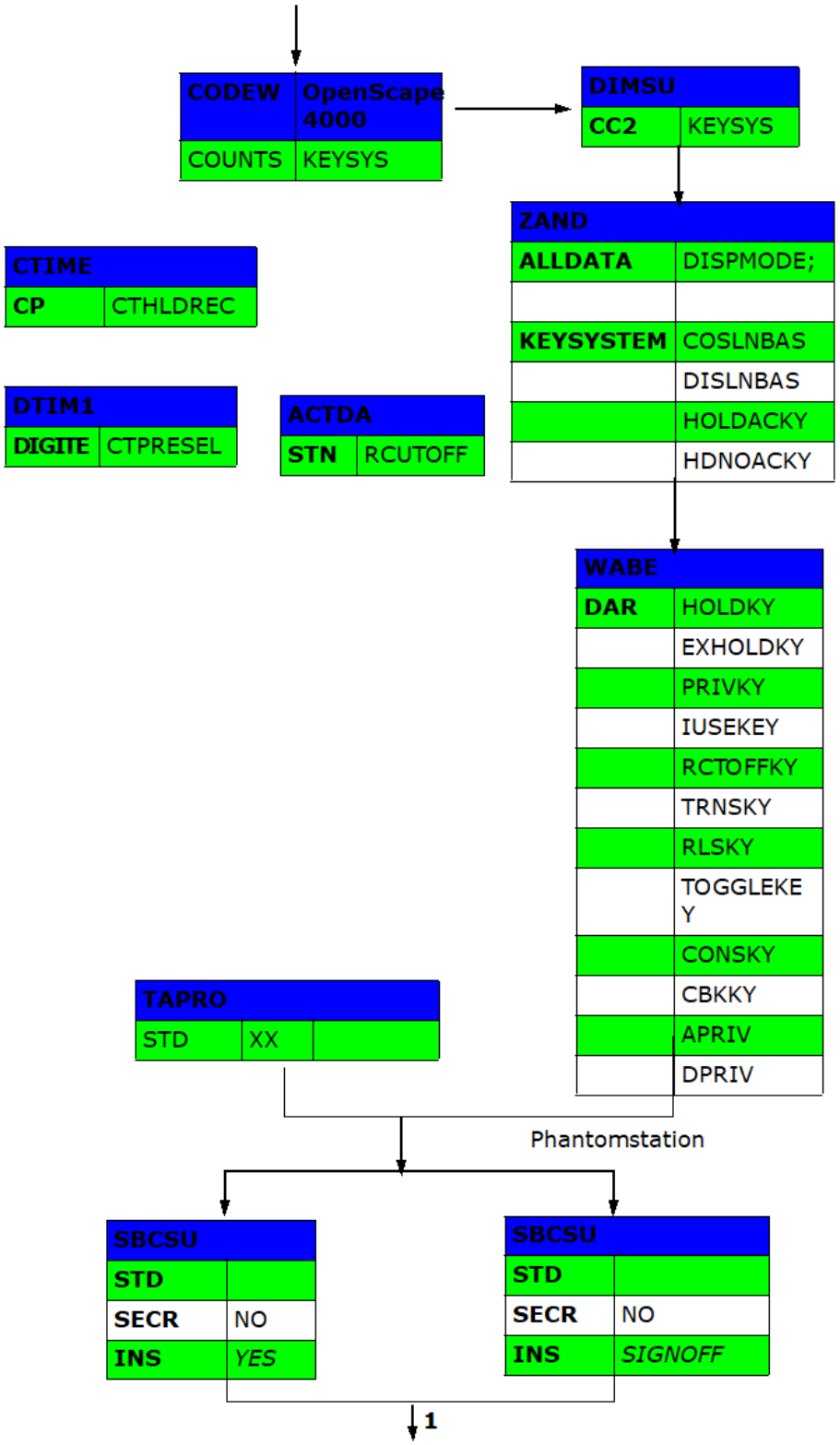
8.11.1.3 Visual Call Forwarding notification for key system lines

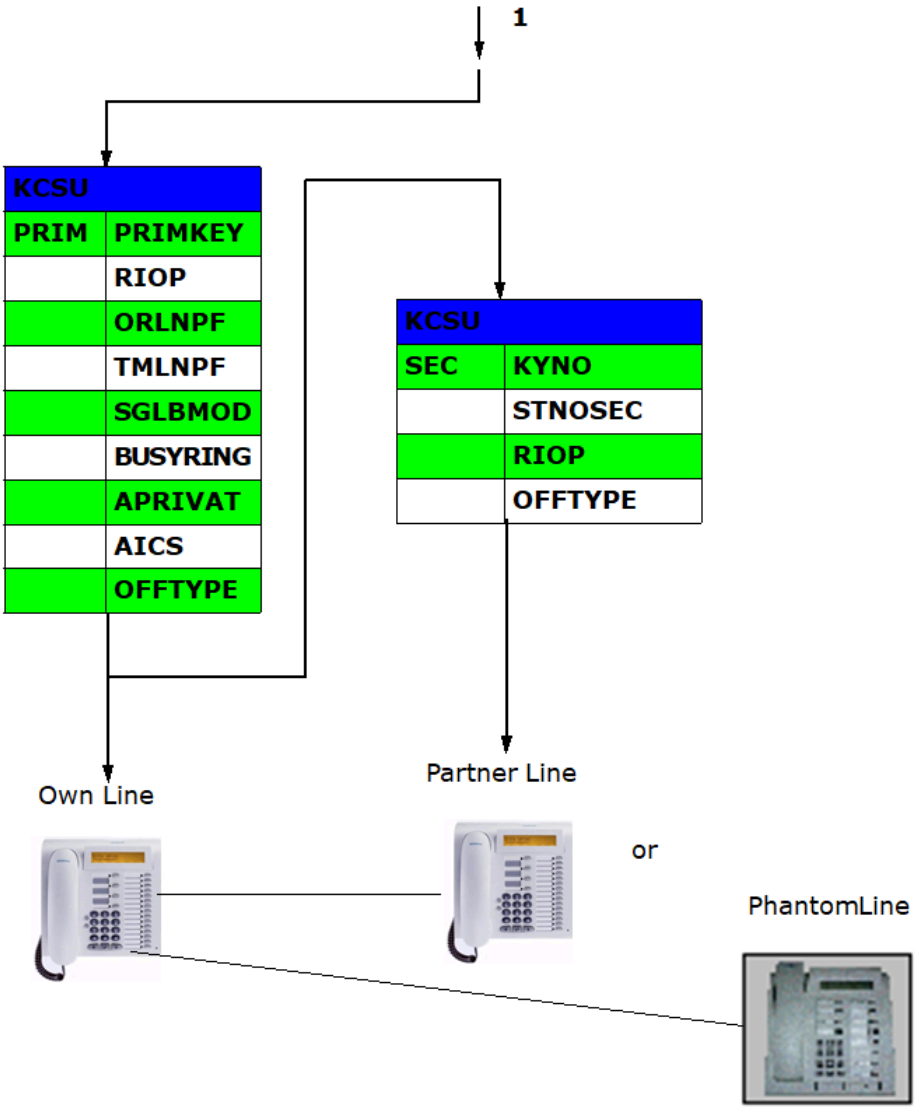
To have visual call forwarding notification for keyset lines that have an active forward:

- Activate CFUI in ZAND ALLDATA3:CHANGE-ZAND:TYPE=ALLDATA3,CFUI=YES; (this change also removes Fixed Call Forwarding from the phone menu)
- Ensure ZAND LEDTYPE has a configuration for CALLFWD e.g. CHANGE-ZAND:TYPE=LEDTYPE,CALLFWD=VERYFAST;

NOTICE: The feature only works for station (not system) forwarding i.e. via phone interface or AMO ACTDA.

8.11.1.4 Keysystem Flowchart





8.11.2 Trading-Executive in a Keysystem

8.11.2.1 Description

The Keysystem feature is expanded with some new functions from the Trading Executive feature. With this it is now possible to create local wide teams with the functionality of the Trading Executive. Except for the "Direct Station Selection Line", the new features can only be used local.

The following new functions are available:

- Direct station selection line
- Mailbox line
- Silent monitoring
- Ringer transfer line

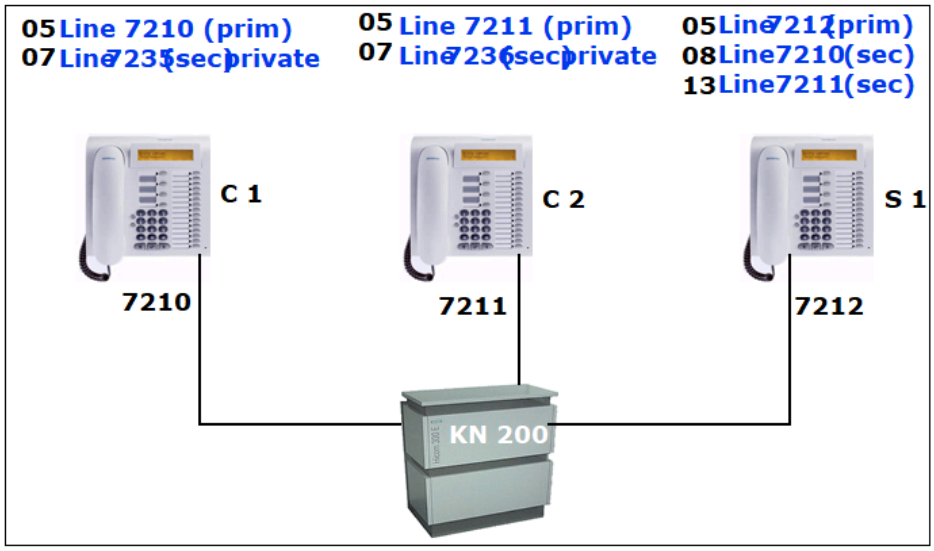
- Repeat dial line

IMPORTANT: In this example, the installing steps for a local Keysystem with the new features are described. After the local example, you will find a network wide example with the DSS function!

8.11.2.2 Installing a local Keysystem with the new features

8.11.2.2.1 Local Keysystem

- The subscribers 7210, 7211 and 7212 are added in node 10-30-200.
- These three subscribers form a Team.



Add a key layout

```
CHANGE-TAPRO:STD=126,DIGTYP=OPTIT19,KY01=CH,KY02=SNR,
KY03=FREE,KY04=SPKR,KY05=LINE,KY07=LINE,KY19=RLS,
INFO="KEY-EXECUTIVE TI_E";

CHANGE-TAPRO:STD=127,DIGTYP=OPTIT19,KY01=CH,KY02=SNR,
KY03=FREE,KY04=SPKR,KY05=LINE,KY08=LINE,KY13=LINE,
KY19=RLS,INFO="KEY-EXECUTIVE TI_S";
```

Subscribers

```
ADD-SBCSU:STNO=7210,OPT=OPTI,CONN=DIR,PEN=1-2-4-6,
DVCFIG=OPTIP500,COS1=33,COS2=33,LCOSV1=9,LCOSV2=9,
LCOSD1=9,LCOSD2=9,DPLN=0,ITR=0,REP=1,STD=126,
TEXTSEL=ENGLISH,CALLOG=TRIES;

ADD-SBCSU:STNO=7211,OPT=OPTI,CONN=DIR,PEN=1-2-4-7,
DVCFIG=OPTIP500,COS1=33,COS2=33,LCOSV1=9,LCOSV2=9,
LCOSD1=9,LCOSD2=9,DPLN=0,ITR=0,REP=1,STD=126,
TEXTSEL=ENGLISH,CALLOG=TRIES;
```

```
ADD-SBCSU:STNO=7212,OPT=OPTI,CONN=DIR,PEN=1-2-4-8,
DVCFIG=OPTIP500,COS1=33,COS2=33,LCOSV1=9,LCOSV2=9,
LCOSD1=9,LCOSD2=9,DPLN=0,ITR=0,REP=1,STD=127,
TEXTSEL=ENGLISH,CALLOG=TRIES;
```

Phantom subscriber

```
ADD-SBCSU:STNO=7235&7236,OPT=OPTI,CONN=DIR,
DVCFIG=OPTIP500,COS1=33,COS2=33,LCOSV1=9,
LCOSV2=9,LCOSD1=9,LCOSD2=9,STD=127,INS=SIGNOFF;
```

Add the KEYSYSTEM

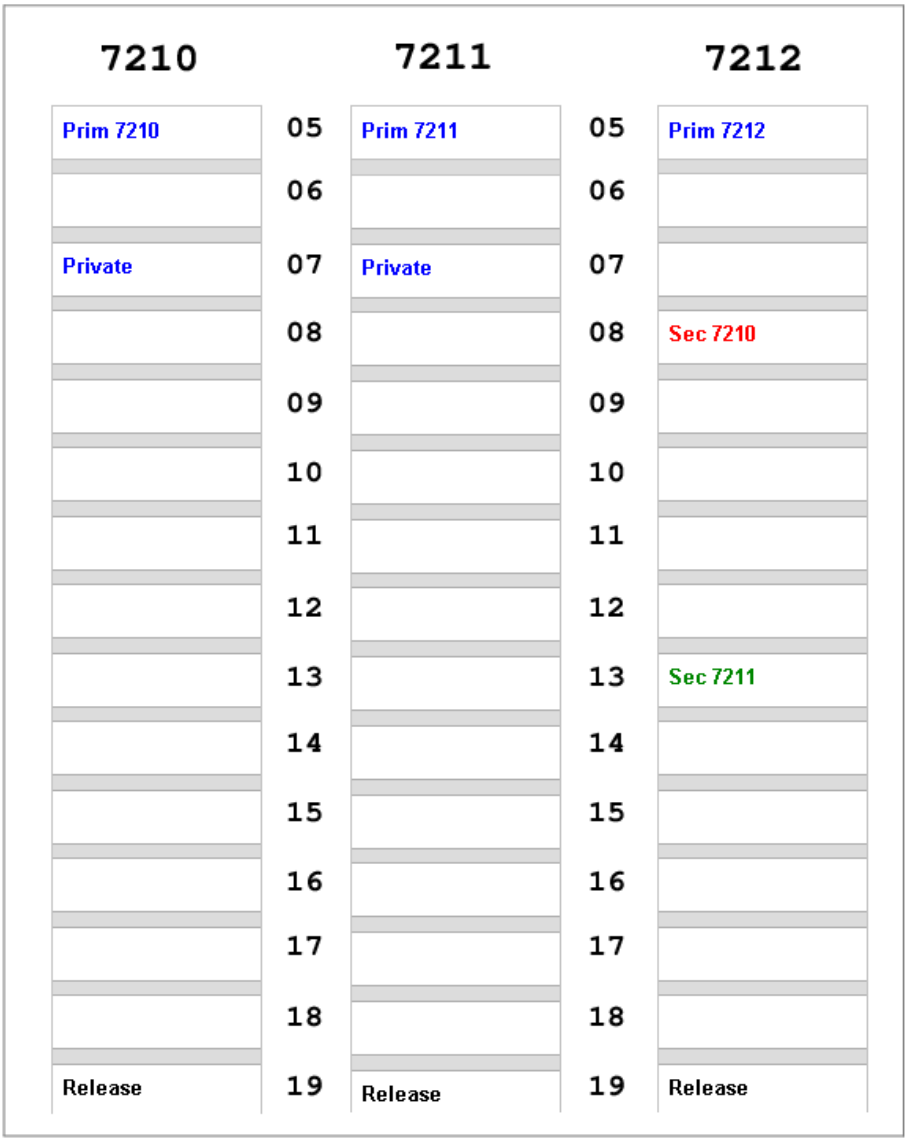
- **primary**

  ```
  ADD-KCSU:STNO=7210,TYPE=PRIM,PRIMKEY=5,
  RIOP=YES,ORLNPF=PRIME,TMLNPF=RING,
  BUSYRING=ALERT,APRIVAT=NO,AICS=NO;

  ADD-KCSU:STNO=7211,TYPE=PRIM,PRIMKEY=5,
  RIOP=YES,ORLNPF=PRIME,TMLNPF=RING,
  BUSYRING=ALERT,APRIVAT=NO,AICS=NO;

  ADD-KCSU:STNO=7212,TYPE=PRIM,PRIMKEY=5,
  RIOP=YES,ORLNPF=PRIME,TMLNPF=RING,
  BUSYRING=ALERT,APRIVAT=NO,AICS=NO;

  ADD-KCSU:STNO=7235,TYPE=PRIM,PRIMKEY=5,
  RIOP=YES,ORLNPF=PRIME,TMLNPF=RING,
  BUSYRING=ALERT,APRIVAT=NO,AICS=NO;

  ADD-KCSU:STNO=7236,TYPE=PRIM,PRIMKEY=5,
  RIOP=YES,ORLNPF=PRIME,TMLNPF=RING,
  BUSYRING=ALERT,APRIVAT=NO,AICS=NO;
  ```

- **secondary**

  ```
  ADD-KCSU:STNO=7210,TYPE=SEC,KYNO=07,STNOSEC=7235,
  RIOP=YES,AICS=NO;

  ADD-KCSU:STNO=7211,TYPE=SEC,KYNO=07,STNOSEC=7236,
  RIOP=YES,AICS=NO;

  ADD-KCSU:STNO=7212,TYPE=SEC,KYNO=08,STNOSEC=7210,
  RIOP=NO,AICS=NO;

  ADD-KCSU:STNO=7212,TYPE=SEC,KYNO=13,STNOSEC=7211,
  RIOP=NO,AICS=NO;
  ```

Key layout after generating this step



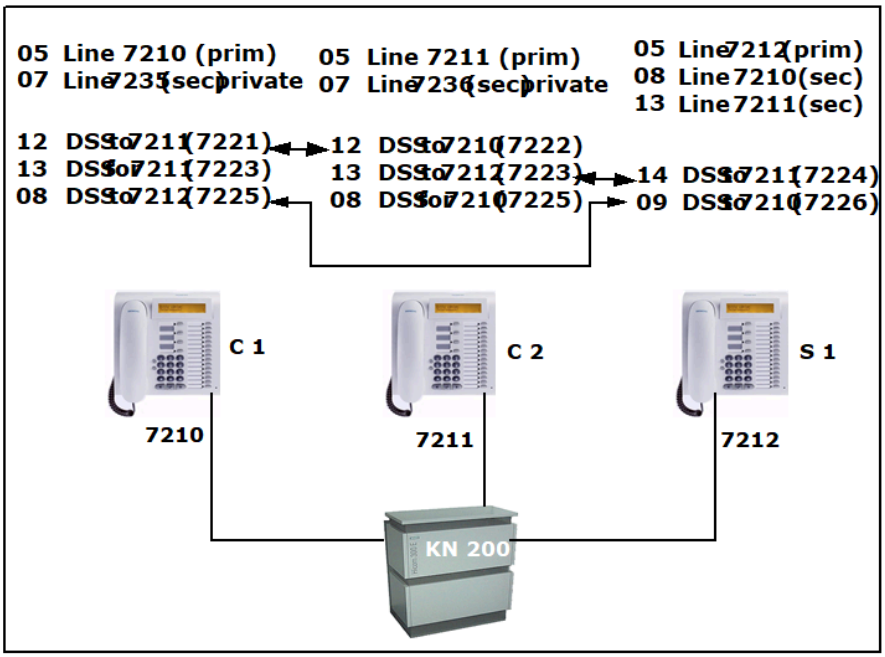
8.11.2.2.2 Direct station selection line

1)

- The direct call line buttons are phantom lines which have a special feature. The direct call destinations are assigned to these lines as hotline destinations The hotline feature program must be activated for this in the system. If the direct call button is pressed, then the accompanying hotline destination is called.
- The phantom lines are always configured in pairs and always show the hotline destinations to each other.
- The number of direct call line buttons is dependent on the number of configured lines at the Keysystem telephone. There can be maximum 29 line buttons on a Keyset i.e: the possible number of direct call buttons is 29 minus the existing Prime and Secondary lines.
- If the direct call line button is configured at several keysets, then it shall be signaled only at a single device (boss). This function corresponds to a status signalling. The LED of the direct call destination shall show only the condition of the configured terminal but not of the others (secretary).

The remaining functionality of the direct call is independent of the terminal type (e.g. flash call, the Name display).

- Expansion of the Keysystem group with the new Features:



Changing key layout (extend STD 126 and 127)

```
CHANGE-TAPRO:STD=126,DIGTYP=OPTIT19,KY08=LINE,
KY12=LINE,KY13=LINE;

CHANGE-TAPRO:STNO=7210&7211,STD=126;

CHANGE-TAPRO:STD=127,DIGTYP=OPTIT19,KY09=LINE,
KY14=LINE;

CHANGE-TAPRO:STNO=7212,STD=127;
```

Phantom subscriber

```
ADD-SBCSU:STNO=7221&&7226,OPT=OPTI,CONN=DIR,
DVCFIG=OPTIP500,COS1=33,COS2=33,LCOSV1=9,
LCOSV2=9,LCOSD1=9,LCOSD2=9,STD=127,INS=SIGNOFF;
```

Extend the KEYSYSTEM

– primary

```
ADD-KCSU:STNO=7221,TYPE=PRIM,PRIMKEY=5,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;

ADD-KCSU:STNO=7222,TYPE=PRIM,PRIMKEY=5,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;

ADD-KCSU:STNO=7223,TYPE=PRIM,PRIMKEY=5,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,BUSYRING=ALERT,APRIVAT=NO,
```

```
AICS=NO;

ADD-KCSU:STNO=7224,TYPE=PRIM,PRIMKEY=5,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;

ADD-KCSU:STNO=7225,TYPE=PRIM,PRIMKEY=5,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;

ADD-KCSU:STNO=7226,TYPE=PRIM,PRIMKEY=5,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;
```

– secondary

```
ADD-KCSU:STNO=7210,TYPE=SEC,KYNO=12,STNOSEC=7221,
RIOP=YES,AICS=NO,DSSLINE=YES;

ADD-KCSU:STNO=7210,TYPE=SEC,KYNO=08,STNOSEC=7225,
RIOP=YES,AICS=NO,DSSLINE=YES;

ADD-KCSU:STNO=7210,TYPE=SEC,KYNO=13,STNOSEC=7223,
RIOP=NO,AICS=NO,DSSLINE=NO;

ADD-KCSU:STNO=7211,TYPE=SEC,KYNO=12,STNOSEC=7222,
RIOP=YES,AICS=NO,DSSLINE=YES;

ADD-KCSU:STNO=7211,TYPE=SEC,KYNO=08,STNOSEC=7225,
RIOP=YES,AICS=NO,DSSLINE=NO;

ADD-KCSU:STNO=7211,TYPE=SEC,KYNO=13,STNOSEC=7223,
RIOP=NO,AICS=NO,DSSLINE=YES;

ADD-KCSU:STNO=7212,TYPE=SEC,KYNO=09,STNOSEC=7226,
RIOP=YES,AICS=NO,DSSLINE=YES;

ADD-KCSU:STNO=7212,TYPE=SEC,KYNO=14,STNOSEC=7224,
RIOP=YES,AICS=NO,DSSLINE=YES;
```

If a DSS line (e.g. Phantom 7223) configured on several terminals as a secondary line, the parameter DSSLINE could be set to "YES" only for one terminal. Therefor the "owner" of the line is marked. If a subscriber is defined as the owner, the DSS peer is informed by the LED at the DSS key, if the owner is in a "busy-state".

Description:

The subscriber 7210 has a DSS-key (key 08) to subscriber 7212 and is defined as the "owner" for this line (DSSLINE=YES). This line is also added for subscriber 7211 (08). But 7211 is not the "owner" of this line (DSSLINE=NO), but could get a call via this key from 7212 to 7210. This possibility is signalized to 7211 by the blinking LED of key 08. Furthermore 7211 could activate a three-party connection during an active call between 7210 and 7212. The LED of key 08 will light constant, if 7210 calls 7212. Thus only the busy state is signalized.

The subscriber 7211 has a DSS-key (key 13) to subscriber 7212 and is defined as the "owner" for this line (DSSLINE=YES). This line is also added for

subscriber 7210 (13). But 7210 is not the "owner" of this line (DSSLINE=NO), but could get a call via this key from 7212 to 7211. This possibility is signalized to 7210 by the blinking LED of key 13. Furthermore 7210 could activate a three-party connection during an active call between 7211 and 7212. The LED of key 13 will light constant, if 7211 calls 7212. Thus only the busy state is signalized.

LED signalizing for the DSS peer in case of a "Busy" state

```
CHANGE-ZANDE:TYPE=ALLDATA,DSSLINE=YES;
```

Define own name for DSS keys

```
CHANGE-ZAND:TYPE=KEYSYS,DISLNBAS=YES
```

e.g.

```
ADD-PERSI:TYPE=STN,STNO=7221,NAME="DSS FROM 7210";

ADD-PERSI:TYPE=STN,STNO=7222,NAME="DSS FROM 7211";

ADD-PERSI:TYPE=STN,STNO=7223,NAME="DSS FROM 7211";

ADD-PERSI:TYPE=STN,STNO=7224,NAME="DSS FROM 7212";

ADD-PERSI:TYPE=STN,STNO=7225,NAME="DSS FROM 7210";

ADD-PERSI:TYPE=STN,STNO=7226,NAME="DSS FROM 7212";
```

Activate Hotline

```
CHANGE-FEASU:TYPE=A,CM=HOTRCL;
```

Add Hotline destinations

```
ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=1,DEST=7221;

ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=2,DEST=7222;

ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=3,DEST=7223;

ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=4,DEST=7224;

ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=5,DEST=7225;

ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=6,DEST=7226;
```

Add the authorization for Hotline

```
CHANGE-COSSU:TYPE=COS,COS=33,AVCE=HOT;

or

CHANGE-SDAT:STNO=7221&&7226,TYPE=ATTRIBUT,AATTR=HOT;
```

Add the Hotline index to the subscribers

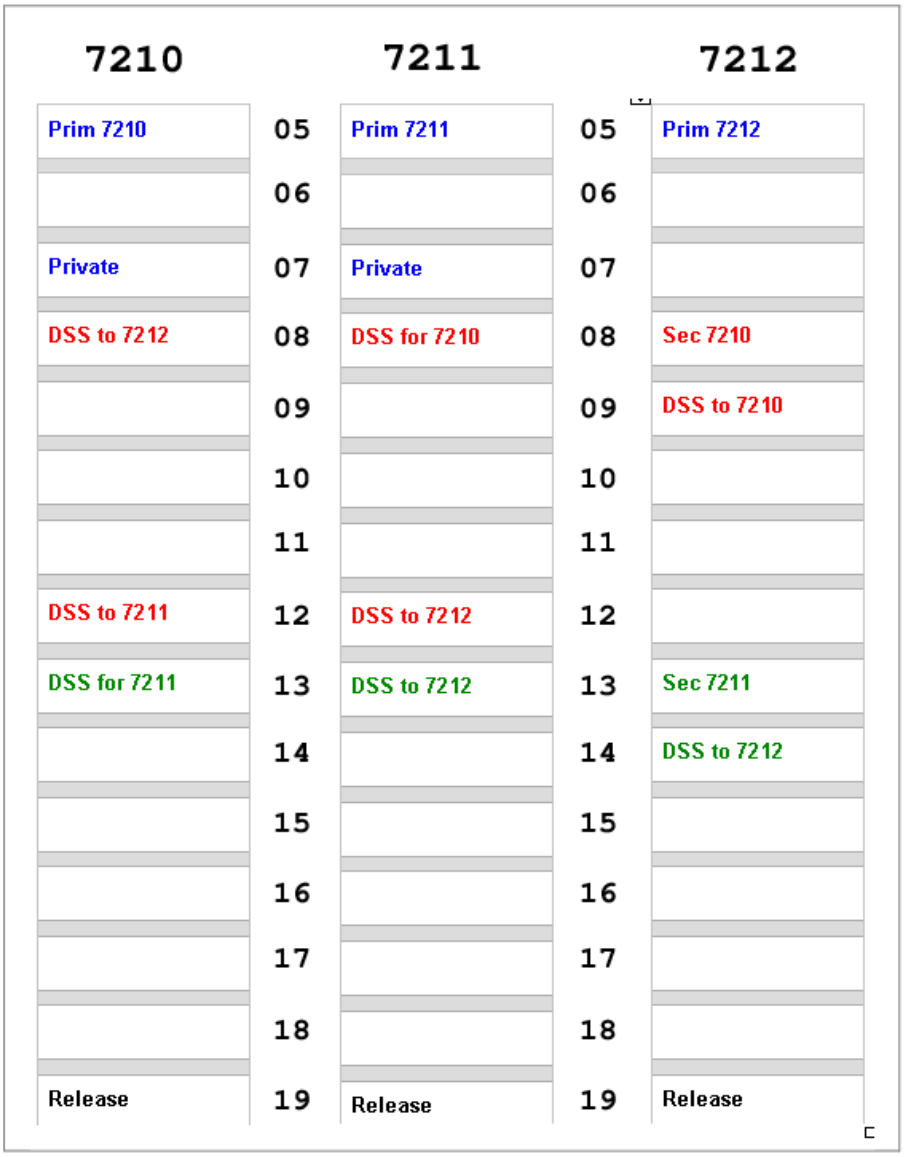
```
CHANGE-SDAT:STNO=7221,TYPE=DATA1,HOTIDX=2;

CHANGE-SDAT:STNO=7222,TYPE=DATA1,HOTIDX=1;
```

```
CHANGE-SDAT:STNO=7223,TYPE=DATA1,HOTIDX=4;

CHANGE-SDAT:STNO=7224,TYPE=DATA1,HOTIDX=3;

CHANGE-SDAT:STNO=7225,TYPE=DATA1,HOTIDX=6;

CHANGE-SDAT:STNO=7226,TYPE=DATA1,HOTIDX=5;
```

Add additional authorization

```
CHANGE-SDAT:STNO=7221,TYPE=ATTRIBUT,AATTR=DSSLINE;

CHANGE-SDAT:STNO=7222,TYPE=ATTRIBUT,AATTR=DSSLINE;

CHANGE-SDAT:STNO=7223,TYPE=ATTRIBUT,AATTR=DSSLINE;

CHANGE-SDAT:STNO=7224,TYPE=ATTRIBUT,AATTR=DSSLINE;

CHANGE-SDAT:STNO=7225,TYPE=ATTRIBUT,AATTR=DSSLINE;

CHANGE-SDAT:STNO=7226,TYPE=ATTRIBUT,AATTR=DSSLINE;
```

Key layout after generating this step

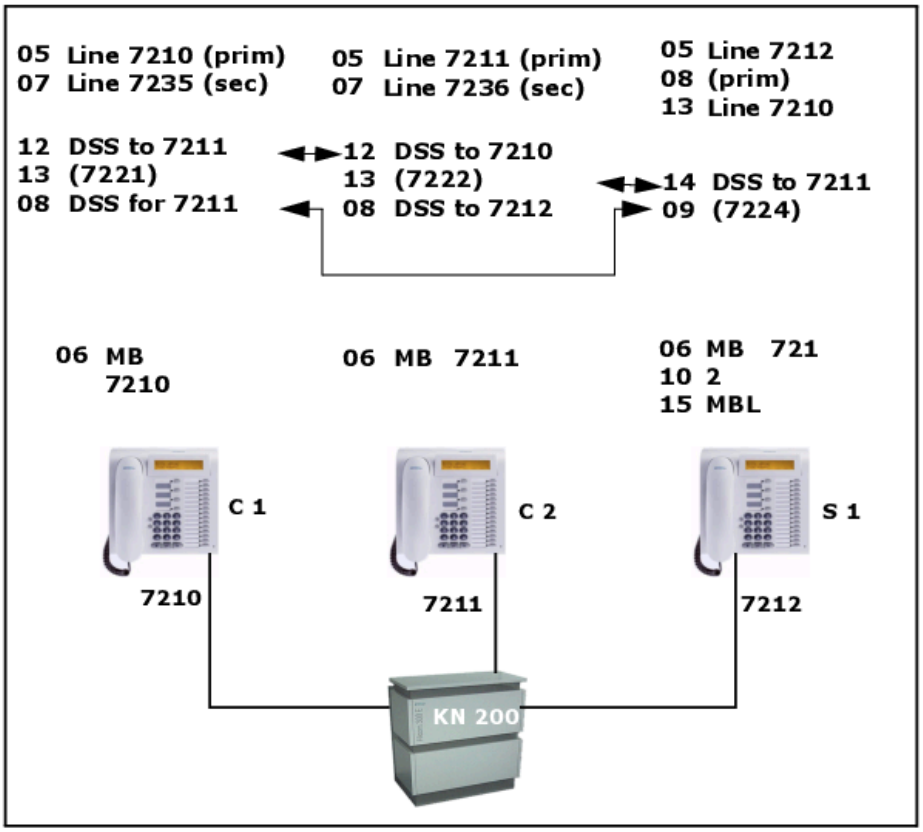


8.11.2.2.3 Mailbox per Line

- The mail box buttons shall be line related (per line an assigned mail box).
- All users who own such a mail box button for a certain line can read, delete and distribute the entries of the mail box.
- Only 1 user can scroll through the same mail box at the same time.
- Per station up to 29 Mail box keys can be configured.

Remark:

- For the phantom lines the Voice/phone-mail features are not reached by call forwarding, because the call forwarding belongs to the terminal and not the line.
- No network wide function



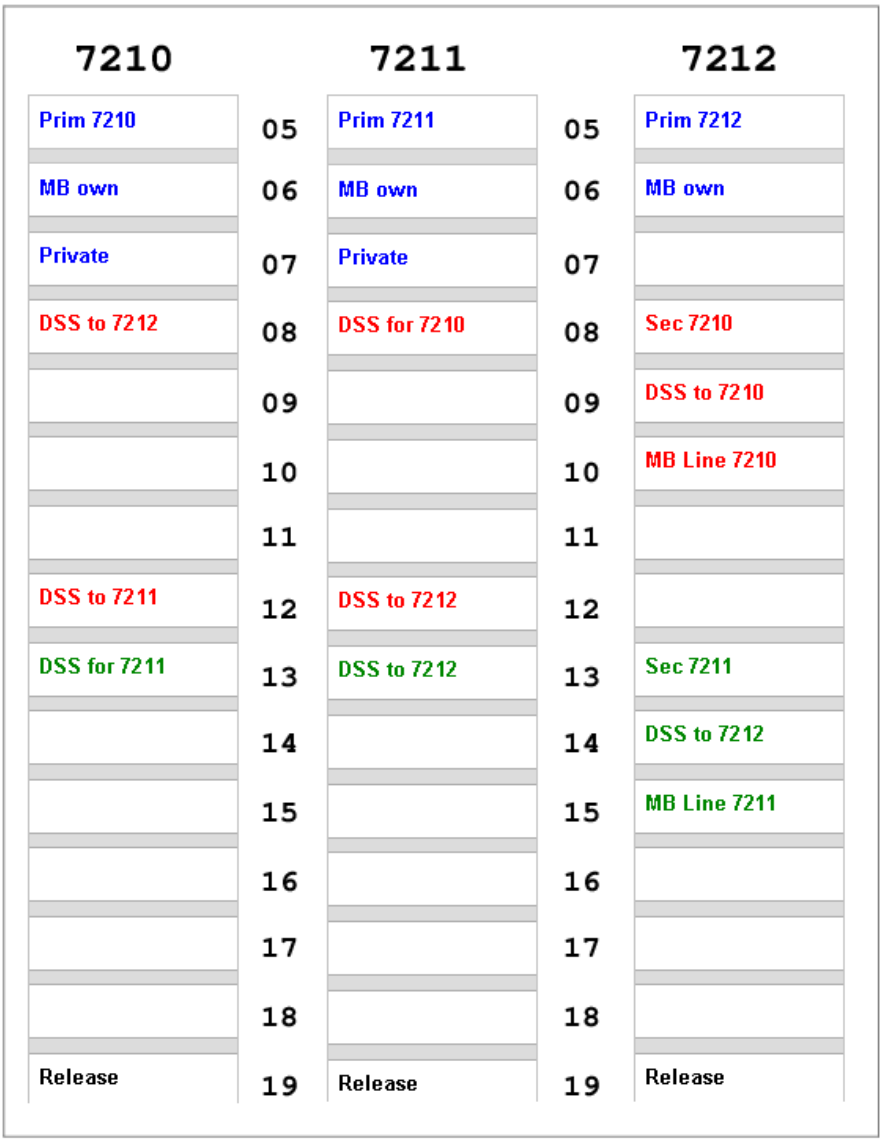
Changing key layout (extend STD 126 and 127)

```
CHANGE-TAPRO:STD=126,DIGTYP=OPTIT19,KY06=MB;

CHANGE-TAPRO:STNO=7210&7211,STD=126;

CHANGE-TAPRO:STD=127,DIGTYP=OPTIT19,KY06=MB,
KY10=MBLINE,KY15=MBLINE;

CHANGE-TAPRO:STNO=7212,STD=127;
```

Add mailbox for line

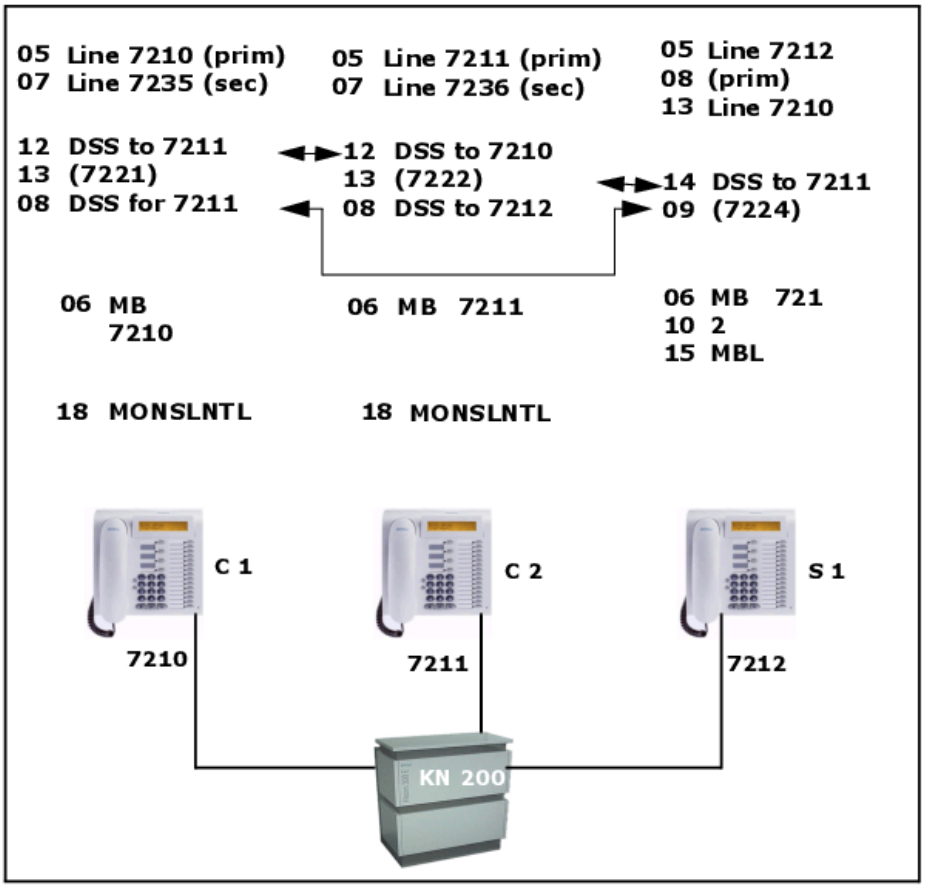
```
ADD-ZIELN:STNO=7212,TYPE=MBLINE,KYNO=10,STNOMB=7210;

ADD-ZIELN:STNO=7212,TYPE=MBLINE,KYNO=15,STNOMB=7211;
```

Key layout after generating this step



8.11.2.2.4 Silent monitoring

- The key **MONSLNTL** uses the BUZZ destination and request the witness (destination) to enter. The witness enters the conversation, after the entry request, by pressing the line button or lifting the handset. The third party does not get any signaling about this and the witness can only listened in. For using the Buzz-function, only **one** witness can be defined per subscriber.
- The "witness" must be in the same OpenScape 4000 and must be a member of a keyset.
- The solution for the add-on witness connection is a combination of the already existing Buzz and bridge features.
- **No network wide function**.



Changing key layout (extend STD 126 and 127)

```
CHANGE-TAPRO:STD=126,DIGTYP=OPTIT19,KY18=MONSLNTL;

CHANGE-TAPRO:STNO=7210&7211,STD=126;
```

Add BUZZ destinations

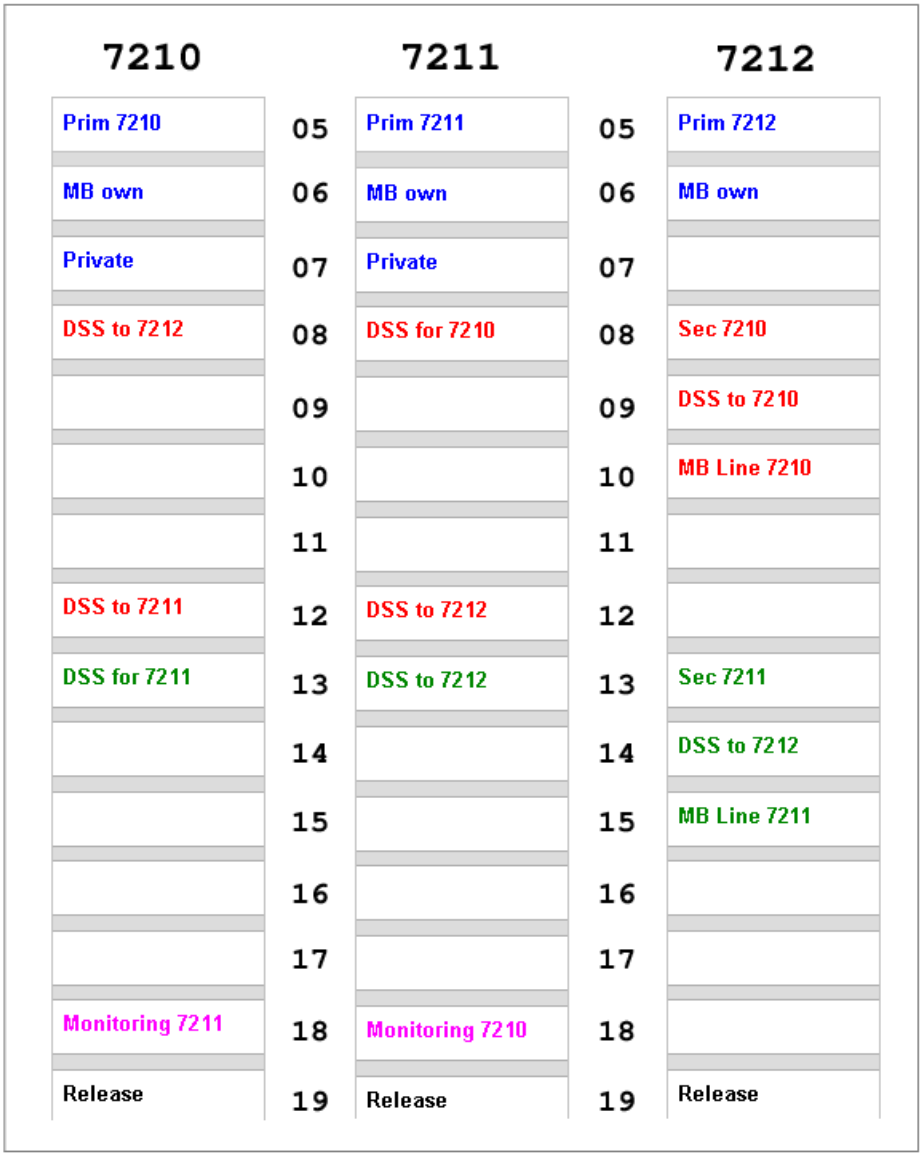
```
ADD-ZIEL:TYPE=BUZZ,SRCNO=7210,DESTNOBZ=7211;

ADD-ZIEL:TYPE=BUZZ,SRCNO=7211,DESTNOBZ=7210;
```

The audible line must exist at both QLRUFNU and BUZRUFNU. Both must also belong to one keyset and be configured on one system. Add additional authorization.

Add additional authorization

```
CHANGE-SDAT:STNO=7210,TYPE=ATTRIBUT,AATTR=MONSLNTL;

CHANGE-SDAT:STNO=7211,TYPE=ATTRIBUT,AATTR=MONSLNTL;
```

Key layout after generating this step

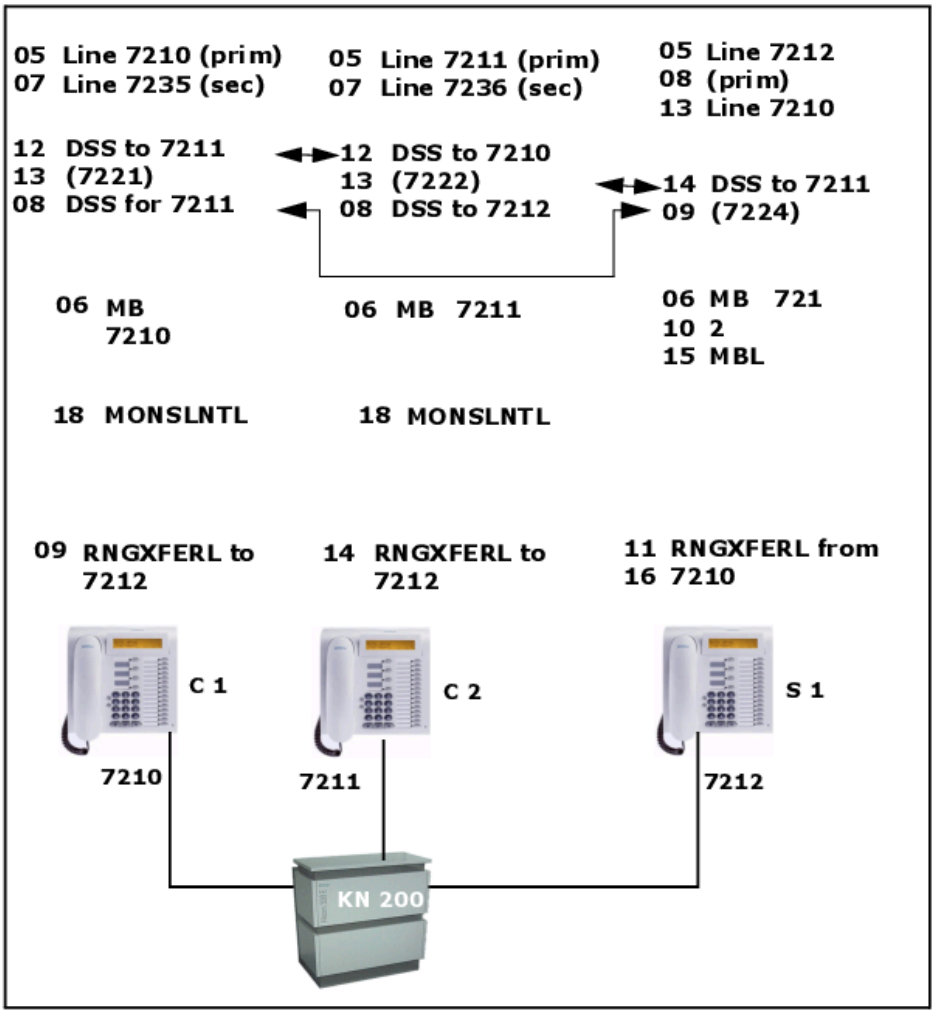


8.11.2.2.5 Ring Transfer

- At a device several Ring Transfer keys to several destinations can be configured.
- The switchover deactivates the acoustic signaling and the incoming calls are signaled by line LED.
- The Ring Transfer changes the RIOP parameter of the affected line at the source and destination terminal.
- A ring transfer button lights if the ring transfer to the destination is activated.
- An incoming call is signaled acoustically, if the participant doesn't have any activated ring transfer and "RIOP =YES" is configured for the called line.
- The RIOP parameter has an initial value which is configured by the AMO KCSU (yes or no).
- Only such lines can be transferred, which would be ringing before the transfer, and are existing on the destination.

Remarks:

- A ring transfer will activate, when no ring transfer chain is created. In chained cases "Not Possible" is seen on the display.
- For further activated Ring Transfer incoming calls can be accepted.
- No network wide function



Changing key layout (extend STD 126 and 127)

```
CHANGE-TAPRO:STD=126,DIGTYP=OPTIT19,KY09=RNGXFERL,
KY14=RNGXFERL;

CHANGE-TAPRO:STNO=7210&7211,STD=126;

CHANGE-TAPRO:STD=127,DIGTYP=OPTIT19,KY11=RNGXFERL,
KY16=RNGXFERL;

CHANGE-TAPRO:STNO=7212,STD=127;
```

Add additional authorization

```
CHANGE-SDAT:STNO=7210,TYPE=ATTRIBUT,AATTR=RNGXFERL;

CHANGE-SDAT:STNO=7211,TYPE=ATTRIBUT,AATTR=RNGXFERL;
```

```
CHANGE-SDAT:STNO=7212,TYPE=ATTRIBUT,AATTR=RNGXFERL;
```

Add Ringer transfer for the subscriber

```
ADD-ZIELN:STNO=7210,TYPE=RNGXFERL,KYNO=05,STNORXFR=7212,
RXFRFCT=SRC;

ADD-ZIELN:STNO=7212,TYPE=RNGXFERL,KYNO=09,STNORXFR=7210,
RXFRFCT=DEST;

ADD-ZIELN:STNO=7211,TYPE=RNGXFERL,KYNO=05,STNORXFR=7212,
RXFRFCT=SRC;

ADD-ZIELN:STNO=7212,TYPE=RNGXFERL,KYNO=09,STNORXFR=7211,
RXFRFCT=DEST;
```

Key layout after generating this step

7210		7211		7212
Prim 7210	05	Prim 7211	05	Prim 7212
MB own	06	MB own	06	MB own
Private	07	Private	07	
DSS to 7212	08	DSS for 7210	08	Sec 7210
RNGXF to 7212	09		09	DSS to 7210
	10		10	MB Line 7210
	11		11	RNGXF from 7210
DSS to 7211	12	DSS to 7212	12	
DSS for 7211	13	DSS to 7212	13	Sec 7211
	14	RNGXF to 7212	14	DSS to 7212
	15		15	MB Line 7211
	16		16	RNGXF from 7211
	17		17	
Monitoring 7211	18	Monitoring 7210	18	
Release	19	Release	19	Release

8.11.2.2.6 Repeat dial function for the used line

- The "redial" key can store destinations of all line keys.
- The last dialed number can be stored line specific.
- Therefore the subscriber gets an additional authorization in AMO SDAT.
- No network wide function

Changing key layout (extend STD 127)

```
CHANGE-TAPRO:STD=126,DIGTYP=OPTIT19,KY02=LNR/SNR;

CHANGE-TAPRO:STNO=7210&7211,STD=126;

CHANGE-TAPRO:STD=127,DIGTYP=OPTIT19,KY02=LNR/SNR;

CHANGE-TAPRO:STNO=7212,STD=127;
```

Add additional authorization

```
CHANGE-SDAT:STNO=7210,TYPE=ATTRIBUT,AATTR=SNRLINE;

CHANGE-SDAT:STNO=7211,TYPE=ATTRIBUT,AATTR=SNRLINE;

CHANGE-SDAT:STNO=7212,TYPE=ATTRIBUT,AATTR=SNRLINE;
```

Activation of the function in AMO ZAND if key LNR is used

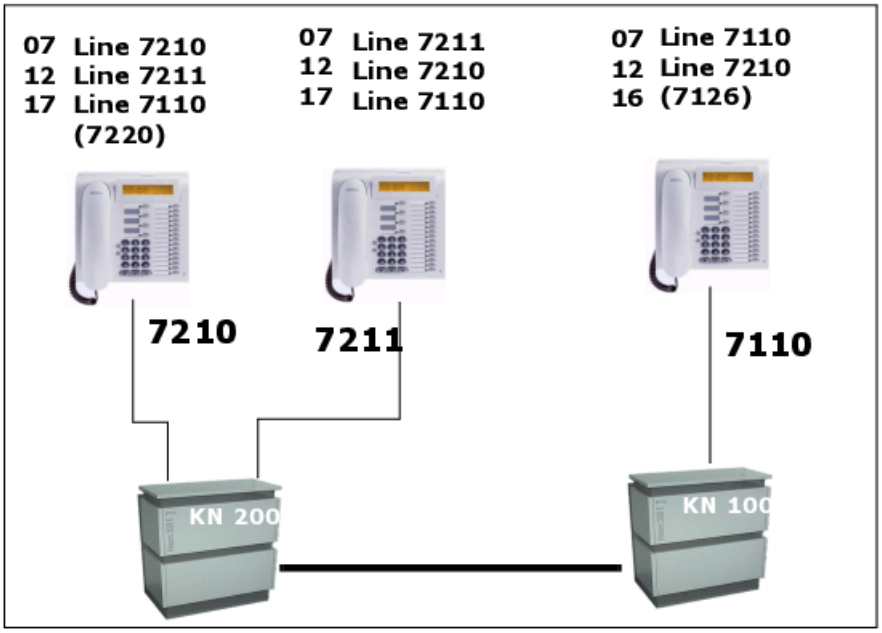
```
CHANGE-ZAND:TYPE=ALLDATA2,LNR=YES;
```

The LNR of 7212 (own line) will be over written, when the line 7210 is used and 7210 has no SNRLINE-authorization.

8.11.2.3 Direct Station Selection network wide

8.11.2.3.1 Installation of the keysystem network wide via two nodes

- The subscribers 7210 and 7211 are added in node 10-30-200.
- The subscriber 7110 is added in node 10-30-100.
- These three subscribers form a Team.



- **Node 200 (SYS 1)**

  Add a key layout

  ```
  CHANGE-TAPRO:STD=127,DIGTYP=OPTIT19,KY01=CH,KY02=SNR,
  KY03=FREE,KY04=SPKR,KY07=LINE,KY12=LINE,KY17=LINE,
  KY19=RLS,INFO="KEY-EXECUTIVE TI";
  ```

  New COS with Goupcall (GRPCAL)

  ```
  ADD-COSSU:NEWCOS=333,AVCE=TA&TNOTCR&CDRSTN&COSXCD&MB&
  CFNR&FWDNWK&TTT&FWDECA&GRPCAL,AFAX=TA&TNOTCR&BASIC&MSN&
  MULTRA,ADTE=TA&TNOTCR&BASIC&MSN&MULTRA,INFO="FOR
   KEYSYSTEM TI";
  ```

  Subscribers

  ```
  ADD-
  SBCSU:STNO=7210,OPT=OPTI,CONN=DIR,PEN=1-2-4-6,DVCFIG=OPTIP500,
  COS1=333,COS2=333,LCOSV1=9,LCOSV2=9,LCOSD1=9,LCOSD2=9,DPLN=0,ITR=0,
  REP=1,STD=127,TEXTSEL=ENGLISH,CALLOG=TRIES;

  ADD-
  SBCSU:STNO=7211,OPT=OPTI,CONN=DIR,PEN=1-2-4-7,DVCFIG=OPTIP500,
  COS1=333,COS2=333,LCOSV1=9,LCOSV2=9,LCOSD1=9,LCOSD2=9,DPLN=0,ITR=0,
  REP=1,STD=127,TEXTSEL=ENGLISH,CALLOG=TRIES;
  ```

  Phantom subscriber

  ```
  ADD-
  SBCSU:STNO=7220,OPT=OPTI,CONN=DIR,DVCFIG=OPTIP500,COS1=333,
  COS2=333,LCOSV1=9,LCOSV2=9,LCOSD1=9,LCOSD2=9,STD=127,INS=SIGNOFF;
  ```

  Add the KEYSYSTEM

  – primary

```
ADD-KCSU:STNO=7210,TYPE=PRIM,PRIMKEY=7,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;

ADD-KCSU:STNO=7211,TYPE=PRIM,PRIMKEY=7,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;

ADD-KCSU:STNO=7220,TYPE=PRIM,PRIMKEY=7,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;
```

– secondary

```
ADD-KCSU:STNO=7210,TYPE=SEC,KYNO=12,STNOSEC=7211,
RIOP=NO,AICS=NO;

ADD-KCSU:STNO=7210,TYPE=SEC,KYNO=17,STNOSEC=7220,
RIOP=NO,AICS=NO;

ADD-KCSU:STNO=7211,TYPE=SEC,KYNO=12,STNOSEC=7210,
RIOP=NO,AICS=NO;

ADD-KCSU:STNO=7211,TYPE=SEC,KYNO=17,STNOSEC=7220,
RIOP=NO,AICS=NO;
```

Add network wide pickup group for TSC-Signaling

```
CHANGE-ZAND:TYPE=ALLDATA3,NETTEAM=YES;

ADD-
AUN:GRNO=2,STNO=7210,REMAC=803001,REMGRNO=2,DISTNO=YES,
NOTRNG=ON3,PUSECOND=YES,SIGNAL=ALL,REMSIGO=YES;

ADD-
AUN:GRNO=3,STNO=7211,REMAC=803001,REMGRNO=3,DISTNO=YES,
NOTRNG=ON3,PUSECOND=YES,SIGNAL=ALL,REMSIGO=YES;

ADD-
AUN:GRNO=4,STNO=7220,REMAC=803001,REMGRNO=4,DISTNO=YES,
NOTRNG=ON3,PUSECOND=YES,SIGNAL=ALL,REMSIGO=YES;
```

- Node 100 (SYS 2)

  Add a key layout

```
CHANGE-TAPRO:STD=127,DIGTYP=OPTIT19,KY01=CH,KY02=SNR,
KY03=FREE,KY04=SPKR,KY07=LINE,KY12=LINE,KY16=LINE,
KY19=RLS,INFO="KEY-EXECUTIVE TI";
```

  New COS with Goupcall (GRPCAL))

```
ADD-COSSU:NEWCOS=333,AVCE=TA&TNOTCR&CDRSTN&COSXCD&MB&
CFNR&FWDNWK&TTT&FWDECA&GRPCAL,AFAX=TA&TNOTCR&BASIC&MSN&
MULTRA,ADTE=TA&TNOTCR&BASIC&MSN&MULTRA,INFO="FOR
 KEYSYSTEM TI";
```

  Subscriber

```
ADD-
SBCSU:STNO=7110,OPT=OPTI,CONN=DIR,PEN=1-1-49-6,DVCFIG=OPTIP500,
COS1=333,COS2=333,LCOSV1=9,LCOSV2=9,LCOSD1=9,LCOSD2=9,DPLN=0,
ITR=0,REP=1,STD=127,TEXTSEL=ENGLISH,CALLOG=TRIES;
```

Phantom subscriber

```
ADD-
SBCSU:STNO=7126&7127,OPT=OPTI,CONN=DIR,DVCFIG=OPTIP500,
COS1=333,COS2=333,LCOSV1=9,LCOSV2=9,LCOSD1=9,LCOSD2=9,STD=127,
INS=SIGNOFF;
```

Add the KEYSYSTEM

– primary

```
ADD-KCSU:STNO=7110,TYPE=PRIM,PRIMKEY=7,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;

ADD-KCSU:STNO=7126,TYPE=PRIM,PRIMKEY=7,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;

ADD-KCSU:STNO=7127,TYPE=PRIM,PRIMKEY=7,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;
```

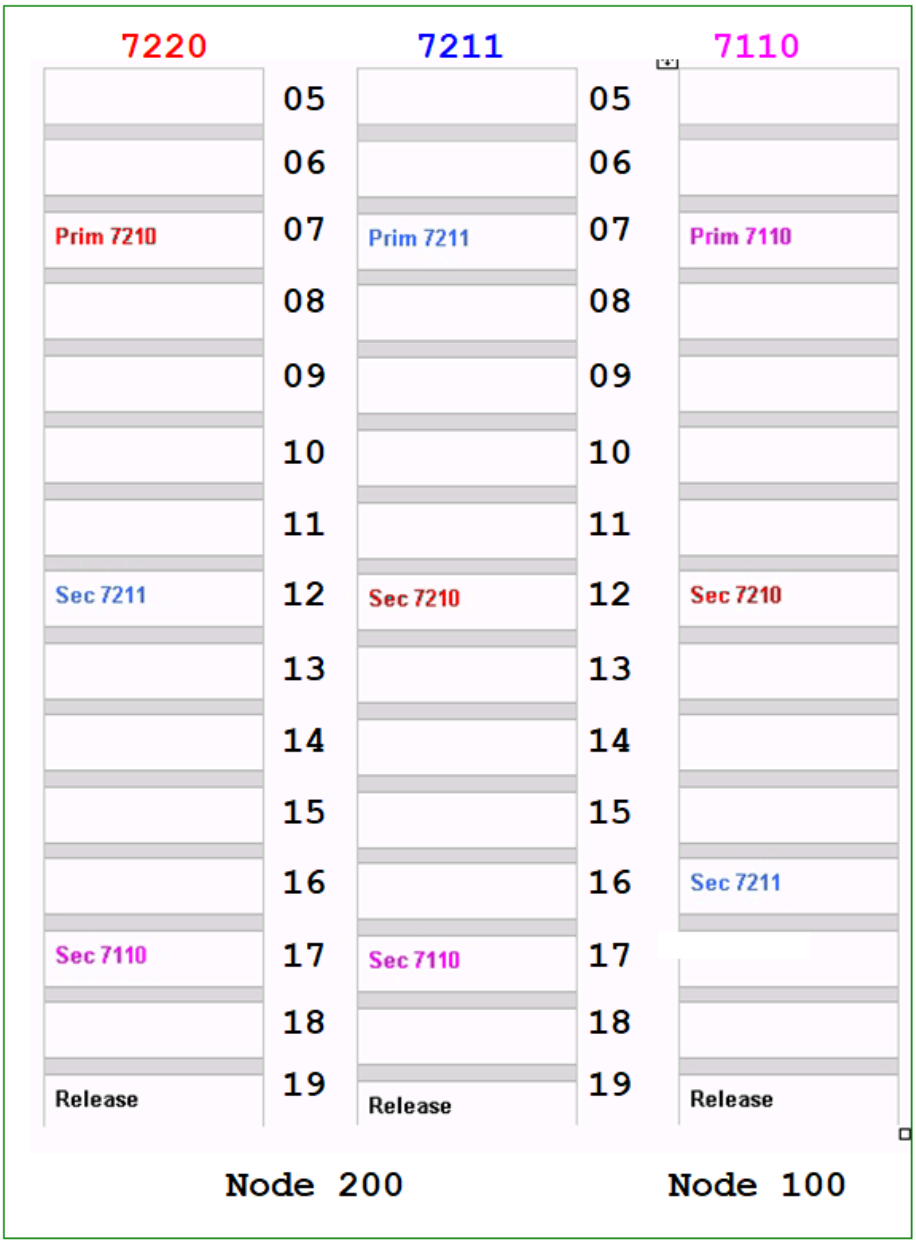
– secondary

```
ADD-KCSU:STNO=7110,TYPE=SEC,KYNO=12,STNOSEC=7126,
RIOP=YES,AICS=NO;

ADD-KCSU:STNO=7110,TYPE=SEC,KYNO=16,STNOSEC=7127,
RIOP=YES,AICS=NO;
```

Add network wide pickup group for TSC-Signaling

```
CHANGE-ZAND:TYPE=ALLDATA3,NETTEAM=YES;

ADD-
AUN:GRNO=2,STNO=7126,REMAC=803002,REMGRNO=2,DISTNO=YES,
NOTRNG=ON3,PUSECOND=YES,SIGNAL=ALL,REMSIGO=YES;

ADD-
AUN:GRNO=3,STNO=7127,REMAC=803002,REMGRNO=3,DISTNO=YES,
NOTRNG=ON3,PUSECOND=YES,SIGNAL=ALL,REMSIGO=YES;

ADD-
AUN:GRNO=4,STNO=7110,REMAC=803002,REMGRNO=4,DISTNO=YES,
NOTRNG=ON3,PUSECOND=YES,SIGNAL=ALL,REMSIGO=YES;
```

Key layout after generating this step



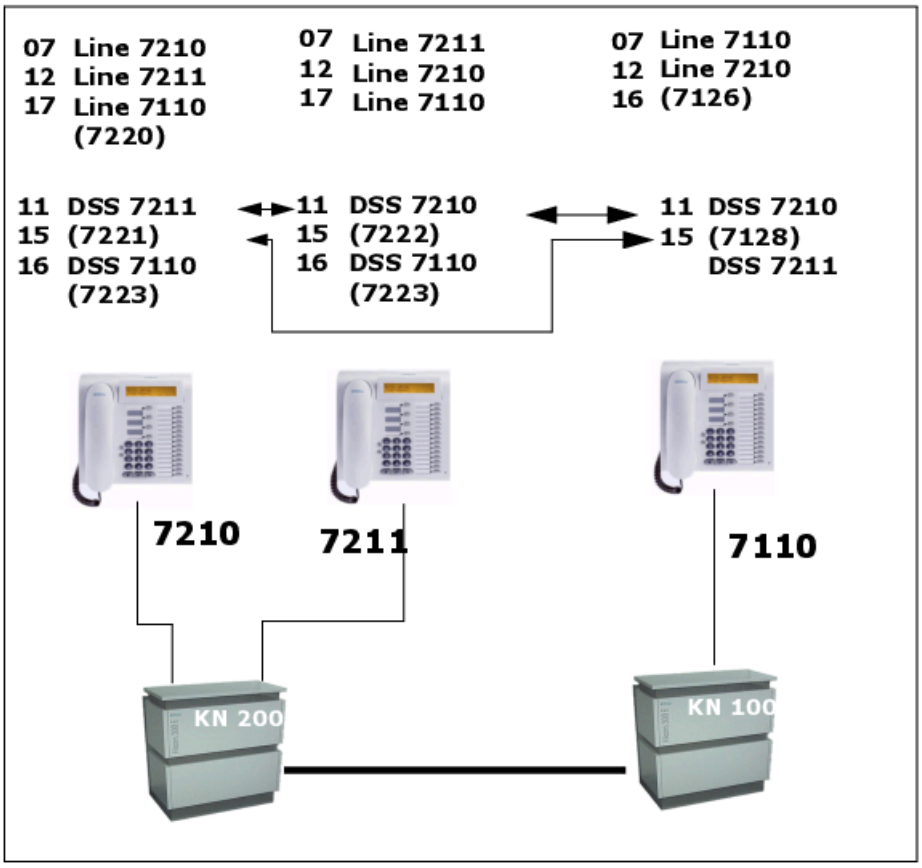
8.11.2.3.2 Direct station selection line

- The direct call buttons or direct call line buttons are phantom lines which have a special feature. The direct call destinations are assigned to these lines as hotline destinations The hotline feature program must be activated for this in the system. If the direct call button is pressed, then the accompanying hotline destination is called.
- The phantom lines are always configured in pairs and always show the hotline destinations to each other.
- The number of direct call buttons is dependent on the number of configured lines at the Keysystem telephone. There can be maximum 29 line buttons on a Keyset i.e: the possible number of direct call buttons is 29 minus the existing Prime and Secondary lines.
- If the direct call line button is configured at several keysets, then it shall be signaled only at a single device (boss). This function corresponds to a

status signalling. The LED of the direct call destination shall show only the condition of the configured terminal but not of the others (secretary). The remaining functionality of the direct call is independent of the terminal type (e.g. flash call, the Name display).

Expansion of the Keysystem group with the new Features:

- Subscribers 7210 and 7211 are configured in node 30-200.
- Subscriber 7110 is configured in node 30-100.
- This three subscribers form one team.



- Node 200 (SYS 1)

  Changing key layout (extend STD 127)

  ```
  CHANGE-TAPRO:STD=127,DIGTYP=OPTIT19,KY11=LINE,
  KY15=LINE,KY16=LINE;

  CHANGE-TAPRO:STNO=7210&7211,STD=127;
  ```

  Phantom subscriber

  ```
  ADD-SBCSU:STNO=7221&&7224,OPT=OPTI,CONN=DIR,
  DVCFIG=OPTIP500,COS1=333,COS2=333,LCOSV1=9,
  LCOSV2=9,LCOSD1=9,LCOSD2=9,STD=127,INS=SIGNOFF;
  ```

  Extend the KEYSYSTEM

  – primary
    ADD-

```
KCSU:STNO=7221,TYPE=PRIM,PRIMKEY=7,RIOP=YES,ORLNPF=PRIME,TMLN
PF=RING,BUSYRING=ALERT,APRIVAT=NO,AICS=NO;
 ADD-
KCSU:STNO=7222,TYPE=PRIM,PRIMKEY=7,RIOP=YES,ORLNPF=PRIME,TMLN
PF=RING,BUSYRING=ALERT,APRIVAT=NO,AICS=NO;
 ADD-
KCSU:STNO=7223,TYPE=PRIM,PRIMKEY=7,RIOP=YES,ORLNPF=PRIME,TMLN
PF=RING,BUSYRING=ALERT,APRIVAT=NO,AICS=NO;
 ADD-
KCSU:STNO=7224,TYPE=PRIM,PRIMKEY=7,RIOP=YES,ORLNPF=PRIME,TMLN
PF=RING,BUSYRING=ALERT,APRIVAT=NO,AICS=NO;
```

– secondary

```
ADD-KCSU:STNO=7210,TYPE=SEC,KYNO=11,STNOSEC=7221,
RIOP=YES,AICS=NO,DSSLINE=YES;

ADD-KCSUSTNO=7210,TYPE=SEC,KYNO=15,STNOSEC=7223,
RIOP=YES,AICS=NO,DSSLINE=YES;

ADD-KCSU:STNO=7210,TYPE=SEC,KYNO=16,STNOSEC=7224,
RIOP=NO,AICS=NO,DSSLINE=NO;

ADD-KCSU:STNO=7211,TYPE=SEC,KYNO=11,STNOSEC=7222,
RIOP=YES,AICS=NO,DSSLINE=YES;

ADD-KCSU:STNO=7211,TYPE=SEC,KYNO=15,STNOSEC=7223,
RIOP=NO,AICS=NO,DSSLINE=NO;

ADD-KCSU:STNO=7211,TYPE=SEC,KYNO=16,STNOSEC=7224,
RIOP=YES,AICS=NO,DSSLINE=YES;
```

If a DSS line (e.g. Phantom 7223) configured on several terminals as a secondary line, the parameter DSSLINE could be set to "YES" only for one terminal. Therefor the "owner" of the line is marked. If a subscriber is defined as the owner, the DSS peer is informed by the LED at the DSS key, if the owner is in a "busy-state".

Description:

The subscriber 7210 has a DSS-key (key 08) to subscriber 7212 and is defined as the "owner" for this line (DSSLINE=YES). This line is also added for subscriber 7211 (08). But 7211 is not the "owner" of this line (DSSLINE=NO), but could get a call via this key from 7212 to 7110. This possibility is signalized to 7211 by the blinking LED of key 08. Furthermore 7211 could activate a three-party connection during an active call between 7210 and 7212. The LED of key 08 will light constant, if 7210 calls 7212. Thus only the busy state is signalized.

The subscriber 7211 has a DSS-key (key 13) to subscriber 7212 and is defined as the "owner" for this line (DSSLINE=YES). This line is also added for subscriber 7210 (13). But 7210 is not the "owner" of this line (DSSLINE=NO), but could get a call via this key from 7212 to 7111. This possibility is signalized to 7210 by the blinking LED of key 13. Furthermore 7210 could activate a three-party connection during an active call between 7211 and 7212. The LED of key 13 will light constant, if 7211 calls 7212. Thus only the busy state is signalized.

LED signalizing for the DSS peer in case of a "Busy" state
`CHANGE-ZANDE:TYPE=ALLDATA,DSSLINE=YES;`

Define own name for DSS keys

```
CHANGE-ZAND:TYPE=KEYSYS,DISLNBAS=YES
```

e.g.

```
ADD-PERSI:TYPE=STN,STNO=7221,NAME="DSS FROM 7210";

ADD-PERSI:TYPE=STN,STNO=7222,NAME="DSS FROM 7211";

ADD-PERSI:TYPE=STN,STNO=7223,NAME="DSS FROM 7210";

ADD-PERSI:TYPE=STN,STNO=7224,NAME="DSS FROM 7211";
```

Activate Hotline

```
CHANGE-FEASU:TYPE=A,CM=HOTRCL;
```

Add Hotline destinations

```
ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=1,DEST=7221;

ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=2,DEST=7222;

ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=3,DEST=7128;

ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=4,DEST=7129;
```

Add the authorization for Hotline

```
CHANGE-COSSU:TYPE=COS,COS=333,AVCE=HOT; or

CHANGE-SDAT:STNO=7221&&7224,TYPE=ATTRIBUT,AATTR=HOT;
```

Add the Hotline index to the subscribers

```
CHANGE-SDAT:STNO=7221,TYPE=DATA1,HOTIDX=2;

CHANGE-SDAT:STNO=7223,TYPE=DATA1,HOTIDX=3;

CHANGE-SDAT:STNO=7222,TYPE=DATA1,HOTIDX=1;

CHANGE-SDAT:STNO=7224,TYPE=DATA1,HOTIDX=4;
```

Add additional authorization

```
CHANGE-SDAT:STNO=7221,TYPE=ATTRIBUT,AATTR=DSSLINE;

CHANGE-SDAT:STNO=7222,TYPE=ATTRIBUT,AATTR=DSSLINE;

CHANGE-SDAT:STNO=7223,TYPE=ATTRIBUT,AATTR=DSSLINE;

CHANGE-SDAT:STNO=7224,TYPE=ATTRIBUT,AATTR=DSSLINE;
```

Activate LED signaling in the network

```
CHANGE-ZAND:TYPE=VMI,MWIOPEN=YES; (for Xpression)

CHANGE-COT:COTNO=xx,COTTYPE=COTADD,PAR=TSCS;
```

- Node 100 (SYS 2)

  Changing key layout (extend STD 127)

  ```
  CHANGE-TAPRO:STD=127,DIGTYP=OPTIT19,KY11=LINE,
  KY15=LINE;
  ```

```
CHANGE-TAPRO:STNO=7110&7126&7127,STD=127;
```

Phantom subscriber

```
ADD-SBCSU:STNO=7228&7229,OPT=OPTI,CONN=DIR,
DVCFIG=OPTIP500,COS1=333,COS2=333,LCOSV1=9,
LCOSV2=9,LCOSD1=9,LCOSD2=9,STD=127,INS=SIGNOFF;
```

Extend the KEYSYSTEM

– primary

```
ADD-KCSU:STNO=7128,TYPE=PRIM,PRIMKEY=7,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;

ADD-KCSU:STNO=7129,TYPE=PRIM,PRIMKEY=7,RIOP=YES,
ORLNPF=PRIME,TMLNPF=RING,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;
```

– secondary

```
ADD-KCSU:STNO=7110,TYPE=SEC,KYNO=11,STNOSEC=7128,
RIOP=YES,AICS=NO,DSSLINE=YES;

ADD-KCSU:STNO=7110,TYPE=SEC,KYNO=15,STNOSEC=7129,
RIOP=YES,AICS=NO,DSSLINE=YES;
```

LED signalizing for the DSS peer in case of a "Busy" state

```
CHANGE-ZANDE:TYPE=ALLDATA,DSSLINE=YES;
```

Define own name for DSS keys

```
CHANGE-ZAND:TYPE=KEYSYS,DISLNBAS=YES
```

e.g.

```
ADD-PERSI:TYPE=STN,STNO=7228,NAME="DSS TO 7110";

ADD-PERSI:TYPE=STN,STNO=7229,NAME="DSS TO 7110";
```

Unblock Hotline

```
CHANGE-FEASU:TYPE=A,CM=HOTRCL;
```

Add Hotline destinations

```
ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=1,DEST=7223;

ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=2,DEST=7224;
```

Add the authorization for Hotline

```
CHANGE-COSSU:TYPE=COS,COS=333,AVCE=HOT; or

CHANGE-SDAT:STNO=7128&&7129,TYPE=ATTRIBUT,AATTR=HOT;
```

Add the Hotline index to the subscribers

```
CHANGE-SDAT:STNO=7128,TYPE=DATA1,HOTIDX=1;

CHANGE-SDAT:STNO=7129,TYPE=DATA1,HOTIDX=2;
```

```
Add additional authorization

CHANGE-SDAT:STNO=7128,TYPE=ATTRIBUT,AATTR=DSSLINE;

CHANGE-SDAT:STNO=7129,TYPE=ATTRIBUT,AATTR=DSSLINE;
```

LED signaling in the network

```
CHANGE-ZAND:TYPE=VMI,MWIOPEN=YES; (for Xpression)

CHANGE-COT:COTNO=xx,COTTYPE=COTADD,PAR=TSCS;
```

Key layout after generating this step

8.11.3 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
KCSU	DRLEITNG	d	Direktrufleitung mit Taste beim Direktrufleitungspartner
	DSSLINE	e	dss line with key on dss line partner
SDAT	DRLEITNG	d	Direktrufleitung
	DSSLINE	e	dss line
	RULEITNG	d	Rufumschaltung der Leitung erwünscht
	RNGXFERL	e	ring transfer for line desired
	WWLEITNG	d	WW-Ziel der benutzten Leitung benutzen
	SNRLINE	e	use redail number of used line
	MITHOERL	d	Mithören/Eintreten ohne Ton in Leitung
	MONSLNTL	e	silent monitoring/bridge of line
TAPRO	BKLEITNG	d	Briefkasten für Leitung
	MBLINE	e	mailbox key for line
	RULEITNG	d	Rufabschaltung der Leitungstasten
	RNGXFERL	e	ring transfer (for executive/ secretary) key
	MITHOERL	d	Mithören/eintreten ohne Ton in die Leitung
	MONSLNTL	e	silent monitoring / bridge of line
ZIELN	BKLEITNG	d	Briefkasten für Leitung
	MBLINE	e	mailbox key for line
	RULEITNG	d	Rufabschaltung der Leitungstasten
	RNGXFERL	e	ring transfer (for executive/ secretary) key
ZANDE	DRLEITNG	d	LED Statusanzeige bei Direktrufleitung
	DSSLINE	e	deactivate LED status display at DSS lines
	ANZKOMRF	d	Ist der Parameter gesetzt,so werden auch kommende Rufe auf der Secondary Line von Key-Systemen angezeigt.
	DSAALINC	e	If this parameter is set,also incoming calls on secondary lines of keysystems will be displayed.

8.11.4 High priority lines in a keysystem

Emergency/priority lines are used e.g. on UK trackside rail infrastructure and it is important that an incoming call from emergency circuit must always ring. If an emergency line rings on the phone, it must always ring with a specific ring type, i.e. be distinguishable from a non emergency call.

Description of the feature may be found also in Feature Description chapter 5.32.12. High priority lines in a keysystem

A single KCSU phone (primary device) has a number of SEC phones (PRIM signoff), a few of which are SEC lines of type 'emergency'.

For the primary device KCSU PRIM BUSYRING=ALERT

The SEC lines used for 'emergency' are marked HIGHPRIO:

DSSPRIO=HIGHPRIO is set in KCSU PRIM config of those 'emergency' SEC numbers (signoff)

SDAT DSSLINE is also set for the these lines.

The current functionality in the scenario with high priority lines is described below:

Primary device busy talking, new incoming call to high priority line starts ringing with high prio corresponding tone and keeps ringing until high prio call is answered or caller hangs up.

Primary device busy ringing, new incoming call to high priority line is signaled with corresponding high prio tone (ring tone is changed accordingly if there was not already a high prio call ringing on the device) and keeps ringing high prio until high prio call is answered or caller hangs up.

If phone is hooked off, device continues ringing with same high prio ringtone.

Even if another normal prio call is answered on the device, device will continue ringing with high prio tone.

Primary device busy talking, 2 new incoming calls (normal and high priority), device starts ringing with corresponding tone for high prio line as soon as the high prio call reaches the device and keeps ringing with this tone until high prio call is answered or caller hangs up.

Primary device busy ringing, 2 new incoming calls (normal and high priority), ring tone is changed to high prio as soon as the high prio call reaches the device, in case there was not already a high prio call ringing on the device, and keeps ringing with this tone until high prio call is answered or caller hangs up.

In case the normal priority call comes in after the high priority call, device keeps ringing with high prio melody.

Primary device ringing with incoming normal priority call, phone is hooked off and a high priority line key is pressed to make an outgoing call, incoming call is silenced because of outgoing high prio call.

8.12 Parallel Ringing - One Number Service (ONS)

8.12.1 General Information

The feature Parallel Ringing – One Number Service (ONS) is used for one person using different phones. Incoming calls are signalled at more than one destination in parallel (simultaneously).

Also a typical scenario is also the use of One Number Service for service deliveries. Depending on who is on duty, the responsible service technician is reachable over one fixed number. If the responsible engineer needs to recall the customer via the SIP device, the server number of the help desk is shown in the customer's display. His own mobile phone number cannot be seen. This ensures that the customer always reaches an employee when calling this number.

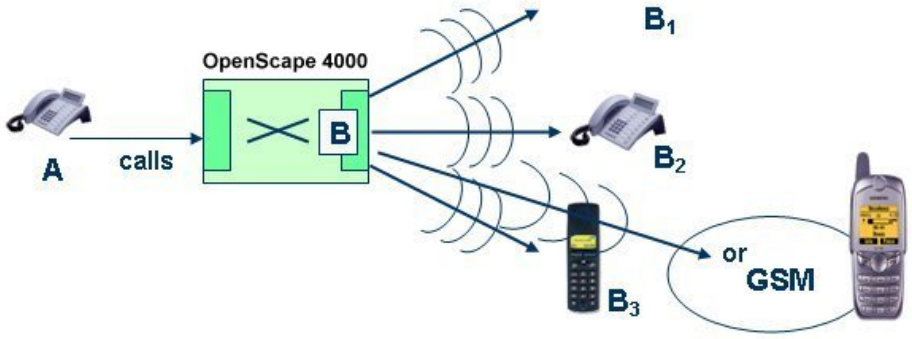


Figure 94: Parallel Ringing with one number

An incoming call is blocked by busy, if one station of the parallel ringing station group is busy.

All internal ONS members have the same idle display showing the ONS master number.

Exception: If a CMI mobile was configured as ONS slave, the idle display does not show the ONS master number. The CMI phones keep in idle state their own numbers on display.

For a basic incoming call to the ONS group the call is signalled at all ONS members. All ONS members see the calling party information. After answering the call by one ONS member all other group members are disconnected from the call. The whole ONS group is called no matter whether the ONS master number or a secondary ONS number has been dialed.

If the ONS master is out of service any incoming call to the ONS group is blocked. If one of the secondary ONS phones is out of service the other phones shall work as usual.

For the ONS call to the external number no CFNR is honored; in this case the external call is released but the internal ONS members are still ringing. The purpose of this processing is to avoid that the ONS call only reaches the mailbox of the GSM network although the ONS person is near one of the internal ONS phones. Trunks who cannot receive reliable answer and disconnect signalling must not be used for the ONS call to the external member. The information from the GSM via the CO is not as detailed as within the PBX network (especially in negative cases when the mobile phone cannot be alerted) and therefore it is recommended that the mobile phone is always turned on.

8.12.2 Service Information

8.12.2.1 General Notes

- Up to 2000 parallel ring groups (ONS group or a call pickup group) are supported within one OpenScape 4000 node.
- The maximum number of ONS members is 3 (master and two slaves).
- Anates, digites, HFA subscribers, SIP subscribers and virtual secondary devices are considered as ONS members (master and/or slave). A virtual ONS master or a **REMAC** number doesn't count as ONS member in this respect.

  If the master/slave of an ONS group is a SIP subscriber please refer to Section 86.2.5, "ONS Groups with SIP Subscriber as Master/Slave".
- As slave (instead of B2 or B3) one GSM mobile phone or another external terminal may be in an external GSM network with the special ringing function "search mobile phone first" (SMPF).
- There is no busy signalization of the ONS master number, if the external subscriber has taken a call.
- One ONS member can call another ONS member of the same group (ONS internal call).
- Last number redial, saved number redial, speed dialing, namekeys, direct station select keys and reminders are available for each ONS device separately.
- For incoming calls the ONS master extension number B is equal B1.

  The features call waiting, call forwarding (CFW), do not disturb (DND), message waiting indication (MWI), callback and call logs are ONS group features.
- Outgoing calls are always initiated with the number, COS and LCOS of the master extension.

  Same COS, same ITR group, same WABE group and same COSX group. This is ensured by using the Permanent PIN feature. The pin of the master device is automatically activated on all slave devices by starting up the phone or by configuring a new ONS group.

  The permanent PIN cannot be modified by the ONS device; only a short PIN, valid for only one call can be activated.

IMPORTANT: PIN for SIP phones is not implemented yet, therefore activation of master PIN is not possible on SIP phone slaves.

8.12.2.2 Interactions with other Features

Call Forwarding

When an ONS group is created the callf orwarding activation status of the ONS master is relevant for the incoming ONS calls. The idle display is updated at the internal ONS members if necessary. Any change of this status by one of the internal ONS members leads to the ONS group callforwarding status change.

Changes via AMO or via ACL service are also effective for the whole ONS group. Call deflect from an ONS member alerted by an incoming call to the static CFW destination of the ONS group is possible.

Notes for SIP subscribers:

Activation/Deactivation of Call Forwarding types using AMO ACTDA for one SIP ONS member is propagated to all SIP ONS members.

Setting of Call Forwarding using AMO ZIEL is not possible for SIP devices. Therefore it does not apply for SIP ONS groups.

Call Forward Busy set with AMO ACTDA is executed only if COS **MULTRA** is not set.

Do not disturb

Do not disturb is also an ONS group feature. The ONS master status for DND determines the DND group status. Any internal ONS member can change this DND status for the whole ONS group. Changes via AMO or via ACL service are also effective for the whole ONS group.

Call Waiting

If call waiting as ONS group feature is activated then a second call to the ONS group is alerting the group even if one ONS member is busy. Call waiting can be (de)activated by a key at the device of the ONS member.

Exception: If all internal ONS devices are anates then the call waiting feature is (de)activated by the AMO AUN parameter PUSECOND.

Message waiting indication (MWI)

Message waiting indication (MWI) is an ONS group feature. MWIs to the ONS group are stored at the ONS master; the status of the MWI led is shown at all internal ONS members.

Call Logs

Call Logs of the ONS group are stored in the call log of the ONS master and can be accessed by any internal digite ONS member. Simultaneous menu access to the call log is prevented. Call log is only supported if the ONS master is a digite.

Callback

Callback activated by an ONS member to another station is not an ONS group feature. Callback execution only alerts the ONS member who has activated callback.

Callback activation to the ONS group, however, is an ONS feature. All members are alerted after callback execution.

Message waiting callback to the ONS group is also an ONS group feature.

IMPORTANT: For SIP subscribers If a slave has COS **MULTRA** set and is busy then Callback Busy cannot be set.

IMPORTANT: If Callback Busy is set when a slave is busy, it is not executed when the slave goes idle. The master should go idle to invoke callback.

Recalls

Recalls to an ONS member are not ONS group calls; they are only alerting the ONS member who has previously transferred the call.

Campon/Override

Campon or override to a busy ONS group is possible.

Keyset

ONS master and ONS secondary extension numbers must not appear at any other keyset. ONS devices may have secondary lines from any other non ONS keysets.

Conference

One ONS member can call another ONS member of the same group (ONS internal call). This call is not alerting any other ONS group members. Therefore it is possible to establish a conference with outside partners and with members of the same ONS group.

Handover

Handover of ONS connections from one internal ONS member to another internal ONS member is possible.

- **Handover by active extension**: A digite ONS member presses the parkkey in talk state. Then the call is parked and the parkkey led of all digite ONS group members starts flashing. The former active ONS subscriber goes onhook and the call can be retrieved by the parkkey.
- **Handover by passive extension**: If there is one basic ONS connection active then another ONS member can retrieve the call by pressing the parkkey. Anates and digites without a parkkey can use the associated accesscode for parking and retrieving a call.

Hunt Group

Only master devices of an ONS group are allowed to be members of a hunt group (but not master). Wird eine ONS-Gruppe über einen Sammelanschluss belegt, wird der AMO AUN Parameter **SMPF** grundsätzlich ignoriert.

The secondary member of an ONS group is able to log on/log off the master of the ONS group (which is also a member of a hunt group) to/from the hunt group.

IMPORTANT: For SIP subscribers: If the ONS master is a SIP phone, then the following hunt group and SIP phone restriction applies: A functional device (or SIP device) configured in a hunt group must never have the parameter **MULTRA** set in AMO COSSU!

DSS key

Calls via DSS key with an ONS number are alerting the whole ONS group.

Service Information

The LED of the DSS key for an ONS master number indicates the state of the ONS group:

- If the ONS group is idle then the LED is off.
- If the ONS group is busy then the LED is on.
- If the ONS group is ringing then the LED is flashing.

For an ONS secondary number the LED of the DSS key indicates the state of the ONS secondary member.

Generation

For a station the ONS master or secondary number is configured as destination for a DSS key. This can be done via AMO ZIEL as well as via programming by the user at the phone.

8.12.2.3 Notes on Configuration

- Subscribers can not be added to OSN groups after they are configured. In this case regenerate,delete and re-add the ONS group with the new subscriber information.
- All members of an ONS group (master and slave - subscribers B1, B2 and B3) are to be configured in the same node.
- Subscribers of an ONS-group must be in the same ITR-group.
- The parallel ringing station group is configured via AMO AUN with parameter **TYPE=ONS**.
- Internal ONS members are assigned by the AMO AUN as group members. The ONS group consists of exactly one ONS master (who has the AMO SDAT parameter **PARARNGM**) and secondary members (who have the AMO SDAT parameter **PARARNGS**).
- The external ONS member number is assigned by the parameter **REMAC**. For this external member a virtual secondary device has to be added as ONS member. This virtual secondary device is configured via AMO SCSU with **DVCFIG=AUXDIGI** and **INS=ACLSTN** and via AMO SDAT parameter **PARARNGS**.
- The ONS master must have a PIN activated with the following AMO PERSI **COPIN** values: **PINDUR=PERM** (permanent), **PARARNGM=YES** (pararing master), **TRANSFER=ALL** (tranfer all key contents and cos), **COSHOME=YES**, **DISPRSTN=NO** (no display of remote station) and **IDHOME=NO**. Outgoing trunks to the central office or to the expression server must have the COT parameter **VNCO** so that the permanent PIN is considered for outgoing calls from an ONS member.
- The AMO AUN parameter **SMPF** (search mobile phone first) indicates for a basic call to an ONS group the following:

  SMPF=YES: The mobile phone is called first before the internal ONS members are called (waiting a time period specified by the AMO CTIME

parameter **SMPFTIME**). If an external station (**REMAC**) is used in an ONS group, the parameter **SMPF** is fixed to **YES** and cannot be changed.

SMPF=NO: The internal ONS members are also called immediately.

IMPORTANT: SMPF is not considered e.g. for a consultation call to the ONS group or if call waiting is active for this call.

- The AMO AUN parameter **ONSSNS** indicates if the number of an ONS secondary member should be suppressed or not.
- The AMO AUN parameter **PUSECOND** indicates if the pickup of a second call to the ONS group is enabled or not. This AMO parameter is relevant for an ONS group where the internal members are only anates. For an ONS group call waiting can be (de)activated via key at the device.

  In addition to the **PUSECOND** parameter: If there is an ONS group with only anate members (and maybe a virtual secondary member and a REMAC) and the feature call waiting should be active for this ONS group then it is recommended to add a virtual ONS master to this ONS group. Only then the call waiting feature is supported. This virtual ONS master must not have the AMO COSSU **COS** parameter **MB** (mailbox) assigned and must not have a MB key assigned via **AMO TAPRO**. This is necessary to ensure that a callback to this anate ONS group is handled according to CCNR (call completion no reply) and not according to the mailbox function (where the mailbox key doesn't exist).

8.12.2.4 Restrictions

- This feature is only active for voice calls.
- The feature is not supported for DSS1 phones (S0), attendant consoles or analog voice terminals connected to a T/R adapter!
- ONS group for CHESE (chief secretary group) members is not supported.
- ONS group members cannot be members of call pickup groups.
- ONS group members must not be configured as night stations.
- ONS group members must not be configured as ACD agents.
- If the master of an ONS group is a SIP subscriber, the secondary members cannot be HFA subscribers.
- MLPP, Emergency Override and emergency disconnect is not supported from and to ONS group members.

8.12.2.5 ONS Groups with SIP Subscriber as Master/Slave

Requirements

- The ONS group must not contain any Anate, TDM or HFA subscriber, if the master is a SIP subscriber. The slaves must also be SIP subscribers.

  If the SIP subscriber is a slave in the ONS group then the master can be a TDM or HFA subscriber (SIP slave is added via **AUXDIGI** and SIP number in **REMAC** of ONS Group).

  The following combinations are possible for HFA, TDM and SIP subscribers:

  Table 54: Combinations of an ONS group with HFA, TDM and SIP subscribers

	Slave: SIP	Slave: HFA	Slave TDM
Master: SIP	x	---	---
Master: HFA	x	x	x
Master: TDM	x	x	x

- The ONS group must not contain an external mobile phone.
- Parallel ringing must be initiated by the SIP subscriber (=MASTER).

Service Information

- ONS group features are limited. Only the currently supported SIP phone features are supported.
- Activation of local features on the SIP phone is not signaled to the system and therefore these features cannot be controlled by the system.
- Some system features are not released for SIP phones and some features exist only for SIP phones. Therefore there are cases when ONS SIP groups behave differently than ONS classic groups.
- COS **MULTRA** (multiple transactions - the station can be seized multiple times) is a parameter which might be set for SIP devices, because it is needed for some features to work correctly. When **MULTRA** is set, the busy state of the SIP device is ignored by the system and a SIP phone is seized.
- Members display

  ONS SIP members keep their own idle display, showing their number rather than the master's number.

  The parameter **DISPRSTN** AMO PERSI:COPIN does not apply for SIP ONS groups. The master number will be always shown for internal SIP ONS calls.

- ACL
  - Call forwarding:

    ACL reports call forwarding situations differently depending of call forward activation (local or system), the COS **MULTRA** parameter and which SIP ONS member is called.

    Remark: Call Forward Unconditional/Busy activated locally on a slave SIP phone is executed and reported as CF No Answer in ACL messages.
  - Incoming Calls:

    ACL reports incoming calls differently to ONS scenarios depending on the COS **MULTRA** and Local Call Waiting settings.
- Local feature interaction
  - Local Do not Disturb (only for SIP subscribers)

    If a member has DND (Do not Disturb) activated locally, all the other ONS members are alerted shortly and then cleared when the member with DND disconnects.

    When DND is set for the ONS member, the behavior differs depending on whether the member is a master or slave. If the member is a master, the calling party gets the disconnect message in dialing state. If the member is a slave, the calling party gets the disconnect message in ringback state, because the master acknowledged the call just beforehand. In this

second case, the DND set for the slave is processed for the calling party as a call reject.

Remark: DND for SIP cannot be set using AMO ACTDA.

– Local Call Forward

A SIP phone can activate internal Call Forward (SIP-specific feature). The system is not informed of this action. Therefore call forward will be only executed when the SIP phone is reached.

When a member has activated a local Call Forward, a call to the SIP ONS group will ring for all members and then it will be forwarded to the call forward destination.

Remarks:

If both Call Forwards No Reply are set (local on the phone and with AMO ACTDA) the one with the shorter no answer timer will be executed.

If master and slave have the same type of local Call Forward activated, the master call forward will be executed.

– Deflect call

Deflect is a local feature that can be used by a SIP phone to transfer the call in a ringing state. When one ONS SIP member invokes this feature, the call will be transferred to the new destination.

– Refuse call

Refuse is a local feature that can be used by a SIP phone to reject a call. When one ONS SIP member invokes this feature, the call will be disconnected.

– Local Do not Disturb

If a member has DND (Do not Disturb) activated locally, all the other ONS members are alerted shortly and then cleared when the member with DND disconnects.

When DND is set for the ONS member, the behavior differs depending on whether the member is a master or slave. If the member is a master, the calling party gets the disconnect message in dialing state. If the member is a slave, the calling party gets the disconnect message in ringback state, because the master acknowledged the call just beforehand. In this second case, the DND set for the slave is processed for the calling party as a call reject.

Remark: DND for SIP cannot be set using AMO ACTDA.

– Local Call Log

Any call to the SIP ONS group will be saved in the alerted member's call log.

– Second call

Call Waiting is a local SIP phone feature that can only be used if COS **MULTRA** is set. The list below contains an overview of ONS group behavior. Call Waiting for SIP phones is possible when the SIP phone

is in talk state. Call Waiting for SIP phones is not possible when the SIP phone is in ringing state.

	ONS group state	action	result when busy SIP has CW on	result when busy SIP has CW off
COS MULTRA set	ONS is busy in ring state	call master	call cleared, busy	call cleared, busy
		call slave	call cleared, busy	call cleared, busy
	ONS is busy, master is in talk state	call master	ONS members ring	ONS members ring shortly and then call cleared, busy
		call slave	ONS members ring	ONS members ring shortly and then call cleared, busy
	ONS is busy, slave is in talk state	call master	ONS members ring	ONS members ring shortly and then call cleared, busy
		call slave	ONS members ring	ONS members ring shortly and then call cleared, busy
COS MULTRA not set	ONS is busy in ring state	call master	call cleared, busy	call cleared, busy
		call slave	call cleared, busy	call cleared, busy
	ONS is busy, master is in talk state	call master	call cleared, busy	call cleared, busy
		call slave	call cleared, busy	call cleared, busy

	ONS group state	action	result when busy SIP has CW on	result when busy SIP has CW off
	ONS is busy, slave is in talk state	call master	call cleared, busy	call cleared, busy
		call slave	call cleared, busy	call cleared, busy

Remark: For the situation when COS **MULTRA** is set and busy SIP phone has Call Waiting off:

- ONS is busy, master is in talk state: the call is disconnected before the request is accepted.
- ONS is busy, slave is in talk state: the call is disconnected after request is accepted.

– Out of Service

If the master SIP device is out of service any incoming call to the ONS group is blocked.

If one of the slave SIP devices is out of service the other members work as usual.

Remark: If the SIP phone is unplugged, it is not signaled as "Out of Service" to the system.

Restriction

- Handover will not be supported
- PIN is not supported for SIP devices; therefore the "PIN permanent" feature isn't used.

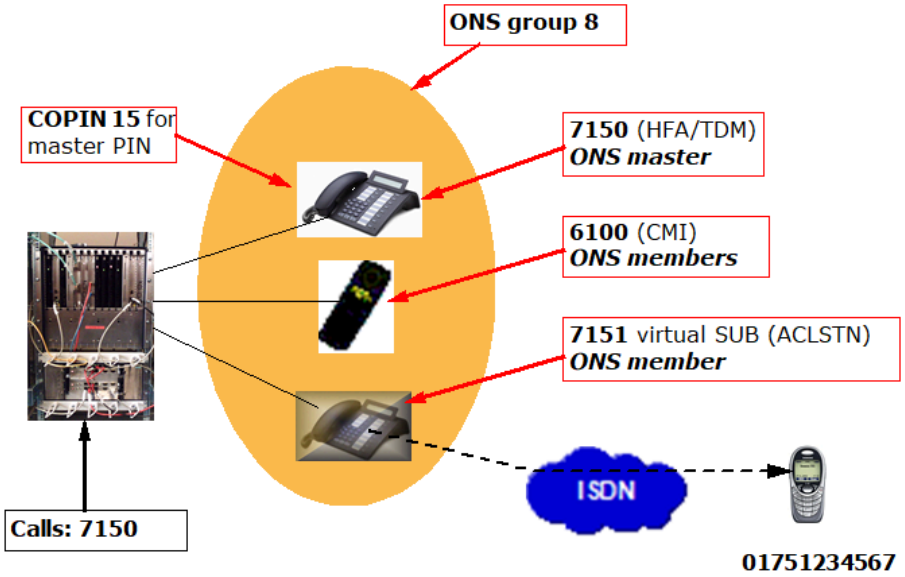
8.12.3 Generation (Example)

8.12.3.1 Configuration steps

- Configuring the real ONS group members
- Configuring the virtual ONS group members
- Setting subscriber authorizations
- Defining the COPIN class used for the master PIN
- Assigning the master PIN to the ONS master
- Adding an ONS group
- Additional control mechanisms

8.12.3.2 Example with Auxiliary Device

IMPORTANT: The example below shows the steps to be followed for AMO configuration. CMI station configuration is not taken into consideration here.



1) System-wide AMOs

```
ADD-DIMSU:TYPE=BASIC,AUXDIGI=xx;
```

xx=number of virtual stations, if GSM devices or other external stations are being used in an ONS group.

2) Checking the FWDMAX counter.

Parallel ringing of ONS members is achieved with the FWD functions:

```
DISPLAY-ZAND:TYPE=ALLDATA2;

CHANGE-ZAND:TYPE=ALLDATA2,FWDMAX=xx;
```

3) Configuring station 7150 (ONS master)

```
ADD-SBCSU:STNO=7150,OPT=OPTI,CONN=IP2,PEN=1-1-37-0,
DVCFIG=OPTIIP,COS1=33,COS2=30,LCOSV1=9,LCOSV2=1,
LCOSD1=5,LCOSD2=1,DPLN=0,ITR=0,SSTNO=NO,COSX=1,SPDI=0,
SPDC2=1,IDCR=NO,REP=0,STD=104,SECR=NO,INS=YES,ALARMNO=0,
RCBKB=NO,RCBKNA=NO,CBKBMAX=5,CBKNAMB=YES,TEXTSEL=GERMAN,
IPCODEC=G711PREF;
```

4) CMI station (6100) **already** configured

5) Configuring the virtual station 7151 (**ACLSTN**)

```
ADD-SCSU:STNO=7151,DVCFIG=AUXDIGI,DPLN=0,ITR=0,
COS1=10,COS2=10,LCOSV1=1,LCOSV2=1,LCOSD1=1,LCOSD2=1,
INS=ACLSTN;
```

6) Assigning station authorization

Master:	CHANGE- SDAT:STNO=7150,TYPE=ATTRIBUT,AATTR=**PARARNGM;**
Slave:	CHANGE- SDAT:STNO=6100,TYPE=ATTRIBUT,AATTR=**PARARNGS;** CHANGE- SDAT:STNO=7151,TYPE=ATTRIBUT,AATTR=**PARARNGS;**

7) Defining COPIN class 15 for the master PIN

```
CHANGE-PERSI:TYPE=SYS,PIN15LEN=4;

CHANGE-PERSI:TYPE=COPIN,COPIN=15,COTYPE=NONE,
PINTEXT="ONS MASTER",DISPRSTN=NO,PINDUR=PERM,
IDHOME=NO,PARARNGM=YES,COSHOME=YES;
```

8) Assigning the master PIN to the ONS master

```
ADD-PERSI:TYPE=STN,STNO=7150,NAME="ONS MASTER",
PIN15=7150,PININDIV=YES;
```

9) Configuring ONS group 8

```
ADD-AUN:GRNO=8,TYPE=ONS,STNO=7150&7151&6100;

ADD-AUN:GRNO=8,TYPE=ONS,REMAC=001751234567;
```

10) Displaying the ONS group

```
DISPLAY-AUN:TYPE=ONS;
+------------------------------------------------------------
+

| GROUP NO.:   8
     |

| PU SECOND CALL:  NO
     |

| ONS :   YES          SMPF :   YES         ONSSNS : NO
     |

|
     |

| SUBSCRIBER:     7150 (MASTER)
     |

|                 7151
     |

|                 6100
     |

| REMAC:  001751234567
     |
```

```
+-------------------------------------------------------
+
```

1) Description of the additional control mechanisms

- AMO PERSI: **ONSSNS**

  ONSSNS = YES:

  When ONS Slave answers a call, only the main ONS will be shown on A Party.

  ONSSNS = NO:

  When ONS Slave answers a call, ONS Slave will also be shown on A Party (as a secondary display line).
- AMO PERSI: **COPIN**

  DISPRSTN = YES:

  The original number is displayed on the B station for an outgoing call from an ONS slave station.

  DISPRSTN = NO:

  The ONS master number is displayed on the B station for an outgoing call from an ONS slave station (default).
- AMO CTIME: CP2, SMPFTIME (default 8 sec.)

  This preset time period is the maximum that the system will wait for a response from the external station (**REMAC** call number). If there is no response after this time has elapsed, the internal ONS stations will ring. If there is a response before this time has elapsed, all free ONS stations ring simultaneously.
- AMO COT: VNCO

  This parameter is needed when calling from a Slave to Central Office (or 3rd party system) to ensure the Calling Number is replaced by that of the ONS.

8.12.3.3 Example with SIP Subscriber (Master and Slave)

1) Checking the FWDMAX counter.
`DISPLAY-ZAND:TYPE=ALLDATA2;`

2) Configuring ONS master

The master SIP phone must have **PARARNGM** set by AMO SDAT.

SIP phone 3432 - Master of ONS group:

```
ADD-SBCSU:STNO=3432,OPT=FPP,CONN=SIP,PEN=1-1-6-35,
DVCFIG=S0PP,COS1=33,COS2=33,LCOSV1=5,LCOSV2=5,LCOSD1=5,
LCOSD2=5,DPLN=0,ITR=0,SSTNO=N,COSX=0,SPDI=0,PROT=SBDSS1,
PERMACT=Y,INS=Y,ALARMNO=0,OPTIDX=10,RCBKB=N,RCBKNA=N,
CBKBMAX=5,HMUSIC=0,PMIDX=1,IPCODEC=G7 11,PASSWD="",
USERID="",SECZONE="";

CHANGE-SDAT:STNO=3433,TYPE=ATTRIBUT,AATTR=PARARNGM;
```

3) Configuring ONS member

The slave SIP phone must have **PARARNGS** set by AMO SDAT.

SIP phone 3433 - member of the ONS group:

```
ADD-SBCSU:STNO=3433,OPT=FPP,CONN=SIP,PEN=1-1-6-36,
DVCFIG=S0PP,COS1=33,COS2=33,LCOSV1=5,LCOSV2=5,LCOSD1=5,
LCOSD2=5,DPLN=0,ITR=0,SSTNO=N,COSX=0,SPDI=0,PROT=SBDSS1,
PERMACT=Y,INS=Y,ALARMNO=0,OPTIDX=10,RCBKB=N,RCBKNA=N,
CBKBMAX=5,HMUSIC=0,PMIDX=1,IPCODEC=G7
 11,PASSWD="",USERID="",
SECZONE="";

CHANGE-SDAT:STNO=3433,TYPE=ATTRIBUT,AATTR=PARARNGS;
```

SIP phone 3434 - member of the ONS group:

```
ADD-SBCSU:STNO=3434,OPT=FPP,CONN=SIP,PEN=1-1-6-37,
DVCFIG=S0PP,COS1=33,COS2=33,LCOSV1=5,LCOSV2=5,LCOSD1=5,
LCOSD2=5,DPLN=0,ITR=0,SSTNO=N,COSX=0,SPDI=0,PROT=SBDSS1,
PERMACT=Y,INS=Y,ALARMNO=0,OPTIDX=10,RCBKB=N,RCBKNA=N,
CBKBMAX=5,HMUSIC=0,PMIDX=1,IPCODEC=G7 11,PASSWD="",
USERID="",SECZONE="";

CHANGE-SDAT:STNO=3434,TYPE=ATTRIBUT,AATTR=PARARNGS;
```

4) Configuring ONS group:

/* SIP subscriber as master and member of an ONS group

```
ADD-AUN:GRNO=1,TYPE=ONS,STNO=3432&3433&3434;
```

IMPORTANT: DIS-AUN for ONS presents the SIP member twice: once in the member's area and once in the REMAC area.

8.12.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
AUN	TYP=ONS	d	One-Number-Service
	TYPE=ONS	e	One Number Service
	TLNNU	d	Teilnehmerrufnummer: Alle internen ONS-Apparate, auch das virtuelle Gerät (wenn benutzt), sind Teilnehmerrufnummern einer Anrufübernahmegruppe.
	STNO	e	Station number: All internal ONS extensions including the virtual device (if needed) are station numbers of a pickup group.

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	REMKZ	d	Remote-Knotenkennzahl: Muss benutzt werden um das externe ONS-Gruppenmitglied (GSM-Telefon) zuzuweisen.
	REMAC	e	Remote access code: Has to be used to assign the external ONS group member (GSM phone).
	AUNZWEIT	d	Anrufübernahme des Zweitanrufs möglich: Anrufübernahme des Zweitanrufs muss benutzt werden, wenn alle ONS-Mitglieder analoge Telefone sind.
	PUSECOND	e	Pick up of second call enabled: Pickup second call has to be used if all ONS members are analog phones.
	SMPF	d	Zuerst Mobiltelefon suchen: Die SMPF-Option ist nur gültig, wenn die Anrufübernahmegruppe die Rolle einer ONS-Gruppe hat.
	SMPF	e	Search mobile phone first: The SMPF option is only valid if the pickup group is in role of an ONS Group.
	ONSSNS	d	ONS-Slave-Nummer unterdrücken
	ONSSNS	e	Suppress ONS Slave Number
SDAT	PARARUFM	d	Master einer Parallelrufgruppe: Muss allen ONS-Master-Apparaten zugewiesen werden.
	PARARNGM	e	Master of a parallel ringing group: Has to be assigned to all ONS master extensions.
	PARARUFT	d	Teilnehmer einer Parallelrufgruppe: Muss allen ONS-Sekundär-Apparaten zugewiesen werden.
	PARARNGS	e	Subscriber of a parallel ringing group: Has to be assigned to all ONS secondary extensions.
PERSI	PARARUFM	d	PIN für Master einer Parallelrufgruppe: Muss der COPIN des ONS-Master-Telefons zugewiesen werden, um das permanente Merkmal PIN zu aktivieren.

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	PARARNGM	e	PIN for master of a parallel ringing group: Has to be assigned to the COPIN of the ONS master phone in order to enable the PIN permanent feature.
	ANZFREMD	d	Zweig COPIN **ANZFREMD = JA**: ONS-Slave-Nummer wird als CLIP gesendet. **ANZFREMD = NEIN**: ONS-Master-Nummer wird als CLIP gesendet.. Das wird durch den Parameter ONSSNS im AMO AUN bewirkt.
	DISPRSTN	e	Branch COPIN **DISPRSTN = YES**: ONS slave number is sent as CLIP. **DISPRSTN = NO**: ONS master number is sent as CLIP. This is effected by the ONSSNS parameter in AMO AUN.
CTIME	SMPFTIME	d	Wartezeit für Rückmeldung des Mobiltelefons
	SMPFTIME	e	Waiting time for Mobile Phone Response

8.13 Personal Device Group

The feature "Peronal Device Group" is a personal group of multiple phones which can be reached under one unique number.

8.13.1 Feature Description

Personal Device Group supports the usage of two devices for one extension number in a OpenScape 4000 system. These are usually one desktop phone and one cordless phone (CMI).

The Personal Device Group concept is based on keyset functionality to allow multiple devices using the same number. Keyset configuration is also allowed for CMI and also a special Personal Device Group flag for the Keysets is introduced. The CMI device has the Personal Device Group number as prime line (Personal Device Group master) and the desktop phone has the Personal Device Group number as secondary line (Personal Device Group slave). The Prime Line of the Desktop Phone is not used.

Outgoing calls from the cordless or the desktop phone transmit always the same number (Personal Device Group number) to the destination.

Incoming calls are signaled on both devices and the user decides where to answer the call.

At the same time only one of the devices can initiate a call with Personal Device Group number. If the CMI is talking the desktop phone can not inintiate a call with Personal Device Group number.

8.13.2 Service Information

The feature "Personal Device Group" will be released in several steps:

- Personal Device Group Step 1

  Support of one desktop phone (optiPoint or openStage, either TDM or IP-HFA) and one CMI

8.13.2.1 Supported Devices

- Personal Device Group master: CMI Cordless (S2, SL2)
- Personal Device Group slave: TDM or HFA device

8.13.2.2 Restrictions

- When parameter **TWINNING** is changed from **YES** to **NO** in AMO KCSU, the extension number on the phone displays are updated only when the phone idle display is shown / updated.
- The master device (CMI) has exactly 1 line (its own prime line) configured.
- The slave device has exactly 2 lines configured (its own prime line and the prime line of the CMI as a secondary line).
- Allthough the CMI is used as a keyset there are no line keys supported for that device. The CMI devices which are being used are S2-SL2 and S3-SL3. There is only one CMI allowed for a Personal Device Group group.
- Attendant is not supported by the Personal Device Group feature.
- All members of the Personal Device Group configuration must be assigned to the same WABE group.
- All members must be in the same switch. It is not possible to combine a desktop phone of one switch with a CMI configured in a different switch.
- Some menu items are handled different on desktop phone and CMI.
- One device can only be in one Personal Device Group group.
- No other keysets may be combined with the Personal Device Group group.

8.13.2.3 Supported Features

IMPORTANT: For features with restrictions the restriction is described in the section of the feature. The features that are not listed in this section are not supported for Personal Device Group!

Basic Call

Incoming call:

In case of an incoming call (intern or extern) to Personal Device Group both devices the desktop phone and the cordless device ring simultaneously. If one of these devices answers the call the other device stops ringing.

Outgoing call:

In case of outgoing call (intern or extern) from Personal Device Group the Personal Device Group number will be displayed on the called device as the calling number no matter if the call was initiated from the cordless or from the desktop phone.

This behavior is also the same in case of call forwarding:

- Call forward unconditional
- Call forward busy
- Call forward no answer

User interface:

On both devices of the Personal Device Group group the Personal Device Group number is displayed as the extension number belonging to the device.

In general the display structure is different in case of cordless and desktop (e.g. optiPoint) phones. This is also the case for the members of a Personal Device Group.

Call back

This feature can be used from and to the devices of a Personal Device Group.

Callback busy / no answer

Callback is supported for a Personal Device Group for internal endpoints only. The callback will be signaled and can be executed on both endpoints of the Personal Device Group.

External devices will not be supported for callback. Therefore no callback busy is possible on external devices.

Configuration:

- Callback without mailbox:

  /* RRFBK=N: Callback on no answer is not stored in the mailbox

  ```
  CHANGE-SBCSU:STNO=twincmi,RCBKB=NO,RCBKNA=NO,OPT=OPTI,
  CBKNAMB=NO;

  CHANGE-SBCSU:STNO=twinopti,RCBKB=NO,RCBKNA=NO,OPT=OPTI,
  CBKNAMB=NO;
  ```

- Callback with mailbox

  /* BRK MAIL BOX (AUTHORIZATION TO RECEIVE MAIL)

  /* set it for the COS of twincmi and twinopti */

  ```
  CHANGE-COSSU:TYPE=COS,COS=23,AVCE=MB;
  ```

  /* RRFBK=J : Callback on no answer is stored in the mailbox

```
CHANGE-SBCSU:STNO=twincmi,RCBKB=NO,RCBKNA=NO,OPT=OPTI,
CBKNAMB=YES;

CHANGE-SBCSU:STNO=twinopti,RCBKB=NO,RCBKNA=NO,OPT=OPTI,
CBKNAMB=YES;
```

Call Forwarding

Call forwarding can be configured on any device of the Personal Device Group. The feature is activated for both devices and the signaling (Display, LED) is done on both devices.

Call Forwarding can be activated for the Personal Device Group number using the following ways:

- Cordless / desktop device menu
- AMO ACTDA / AMO ZIEL for the Personal Device Group number
- ACL Feature ACT Deact Service on CTI interface

Call Forwarding will be activated for the Personal Device Group number: If a device calls the Personal Device Group number the call will be forwarded to the forwarding destination and none of the Personal Device Group devices (desktop or cordless) will ring.

If the Personal Device Group device has a **Call Forward busy** activated then the call is forwarded to the CFW destination, e.g. digite device, Attendant, Voice Mail in case of the Personal Device Group number is busy. Therefore either the cordless device is busy or the desktop phone is busy using the Personal Device Group number.

Call Forwarding can be activated/deactivated on any of the Personal Device Group devices.

Please refer also to Basic Call.

Camp On

Automatic camp on can be activated /deactivated on any of the Personal Device Group devices. Manual Camp On (caller activates camp on) is not supported.

Automatic Camp On has to be activated on both devices (Personal Device Group master and slave). This is automatically done synchronously if one of the devices activates or deactivates the feature.

If an incoming second call is calling the Personal Device Group it will camp on the active device only (the one using actually the Personal Device Group line). Camp on is not signaled on the second device of the Personal Device Group.

Call Log / Call Journal

The local Call Log functionality does not support Personal Device Group. It must not be used. To offer call log and phonebook only DTB is allowed. This application supports the same call log and phone book entries on both devices.

Call Pickup

The Personal Device Group number can be configured to be a member of a call pickup group.

The incoming calls to another device in the call pickup group can be picked up by any member of the Personal Device Group (cordless and desktop phone).

The incoming calls to the Personal Device Group number can be picked up by any other member of the call pickup group.

Configuration:

Add twincmi and twinopti to the pick up group as any usual extension number.

Call features during an active call

The following call features are supported by the cordless device during an active call:

- Consultation
- Transfer
- Toggle
- Conference

Park / Hold

An active call (that is in call state) can be put on hold the following ways:

- by selecting Halten/Hold in the phone menu (cordless phone, desktop phone).
- by pressing the line key (desktop phone).

This call can be retrieved by the desktop phone by pressing the blinking line key belonging to the phone.

Restriction:

The cordless phone cannot retrieve a call that has been put on hold this way.

Configuration:

The park timer can be set with the following AMO configuration:

```
CHANGE-CTIME:TYPESWU=CP1,CTHLDREC=<timer to control the
 duration
of a manual hold of a call>;
```

If the timer has expired the Personal Device Group will be ring back and both member of Personal Device Group can accept the call.

Hunt groups

Personal Device Group can be a member of the hunt group. The twincmi must be added to the hunt group by using AMO SA.

When the hunt group routes an incoming call to the Personal Device Group number, both Personal Device Group devices start ringing and any of the Personal Device Group devices can answer the call.

Do not disturb

Do not disturb can be activated/deactivated on any device of the Personal Device Group. The signaling (based on device possibilities) is done on both devices of the Personal Device Group.

CHESE

Chese functionality is not supported.

Timed Reminder

Timed Reminder is supported with Personal Device Group.

Speed Dial List (SPDI)

Speed dial list can be used on both devices of the Personal Device Group. Both devices use the same short calling list, i.e. changing the short challing list on one of the devices will be visible also on the other device.

When configuring the short calling list using AMO ZIEL, parameter **SPDI**, the same configuration has to be done for both twincmi and twinopti.

Ringer Cut Off

For ringer cutoff two keys can be configured on the desktop phone of the Personal Device Group:

- ringer cutoff for desktop phone
- ringer cutoff for CMI phone

Desktop phone

When ringer cutoff is activated for the desktop phone, incoming calls to the Personal Device Group number are indicated in the following way:

- On the cordless phone the call is indicated as if ringer cutoff was not active
- On the desktop phone there is no ringing / display update. Only the blinking line key indicates the call.

Cordless phone

When ringer cutoff is activated for the cordless phone, incoming calls to the Personal Device Group number are indicated in the following way:

- On the cordless phone the call is absolutely not indicated. Note that during such a call attempt the cordless phone seems "idle" however it is not possible to initiate outgoing calls using this device.
- On the desktop phone the call is indicated as if ringer cutoff was not active.

Configuration:

```
CHANGE-TAPRO:STNO=twincmi,KY08=RNGXFERL; /*CMI*/

CHANGE-TAPRO:STNO=twincmi,KY12=RNGXFERL; /*CMI*/

CHANGE-TAPRO:STNO=twinopti,KYx=RNGXFERL;

CHANGE-TAPRO:STNO=twinopti,KYx=RNGXFERL;

CHANGE-SDAT:STNO=twincmi,TYPE=ATTRIBUT,
AATTR=RNGXFERL;

CHANGE-SDAT:STNO=twinopti,TYPE=ATTRIBUT,
AATTR=RNGXFERL;

ADD-ZIELN:STNO=twincmi,TYPE=RNGXFERL,KYNO=8,
STNORXFR=twincmi,RXFRFCT=SRC;

ADD-ZIELN:STNO=twincmi,TYPE=RNGXFERL,KYNO=12,
STNORXFR=twinopti,RXFRFCT=DEST;

ADD-ZIELN:STNO=twinopti,TYPE=RNGXFERL,KYNO=x,
STNORXFR=twincmi,RXFRFCT=DEST;
```

```
ADD-ZIELN:STNO=twinopti,TYPE=RNGXFERL,KYNO=x,
STNORXFR=twinopti,RXFRFCT=SRC;
```

Direct Station Selection (DSS) Key

If one of the devices has a configured DSS Key with configured destination of the Personal Device Group on the DSS key the busy condition of the Personal Device Group is displayed via a LED.

If the Personal Device Group is called despite being busy, call waiting is automatically activated.

By pressing the flashing DSS key while the Personal Device Group is being called, it is possible to take the call if the calling party and the Personal Device Group are in the same pickup group.

Restriction:

A DSS key can only be configured on the desktop phone of a Personal Device Group.

Class of Service (COS) Switchover (AMO BERUM)

The class of service switchover feature can be activated and deactivated either on the desktop or on the cordless phone.

The Class of Service will be changed for Personal Device Group number and can be queried using AMO BERUM.

The desktop and the cordless phone must be in the same COS group. When doing AMO configuration both twincmi and twinopti has to be configured the same way.

Keyset

A Personal Device Group must not be combined with other Keysets. The CMI is only allowed to have one line configured and for the desktop phone exactly two lines are required (own prime line and Personal Device Group number as secondary line).

CDRE

CDRE is supported for devices of the Personal Device Group. In the accounting tickets the Personal Device Group number (twincmi) will be reported as paying party.

SPE

SPE is supported for devices of a Personal Device Group. Both twincmi and twinopti must be configured for the same security level.

CTI / ACL functionalities:

ACL Monitoring

In monitor events always the Personal Device Group extension number (twincmi) is reported.

ACL Services

ACL services which support the Personal Device Group number:

- Service Comment
- Alternate-Call-Request
- Clear-Connection-Request

- Callback-Request
- Cancel-Callback-Request
- Conference-Call-Request
- Consult-Call-Request
- Deflect-Call-Request
- Dial-Digits-Request
- Divert-Call-Request
- Feature-act/deact-Request
- Feature-Status-Request
- Generate-Digits-Request
- Generate-Telephony-Tone-Request
- Make-Call-Request
- Make-Predictive-Call-Request
- Reconnect-Call-Request
- Single-Step-Transfer-Call-Request
- Transfer-Call-Request
- Device Type Check CMI is reported for the Personal Device Group number.
- Get-Switching-Funct-Devices New device type "Personal Device Group" is reported for twinning number.
- Monitor Set/Cancel
- Snapshot-monitor
- Snapshot-call
- I/O services The Personal Device Group number is to be used to access the CMI. Primary line extension number of desktop phone is to be used to access the desktop phone.
- Set-Lamp-Mode The Personal Device Group number is to be used to access the CMI. Primary line extension number of desktop phone is to be used to access the desktop phone.
- Answer-call-Request It is working only for the desktop phone.
- Hold-Call-Request Service is disabled.
- Retrieve-Call-Request Service is disabled.
- Invoke-Feature Service is disabled.
- Button-Press-Request Service is disabled.
- Escape services Service is disabled.

The other ACL services that are not present in the list above are not directly affected by Personal Device Group.

Restrictions:

- The service disabling is working, if the configuration is not correct e.g:

  A desktop phone is configured with AMO KCSU as Personal Device Group device, but there is not any CMI (configured as Personal Device Group master) to assign to this desktop phone. In this case the service will be disabled for desktop phone.
- ACL Make Call Service is not working for a Personal Device Group.

Corresponding applications

CA4000 standalone version

Version CA4000 standalone Version 7.1.4.2

If an older version of the CA4000 standalone is installed on the PC, then it must be removed and replaced with this version!

IMPORTANT: If the configuration of the "Personal Device Group" feature is changed then the CA4000 must be restarted to provide the needed functionality regarding this feature.

DTB

The following version of DTB supports the Personal Device Group:

DTB V9.0 R19.0.2

This application supports the same call log and phone book entries on both devices of the Personal Device Group.

BLF

The BLF-Win application supports the Personal Device Group number.

In case of Personal Device Group only the "master number" should be entered at the BLF-Win grid, because the informations for the "slave number" may be wrong.

8.13.3 Generation (Example)

The configuration example shows how to configure a Personal Device Group. The CMI (master) member of the group will be represented by the symbolic extension number "twincmi". The optiPoint (slave) member of the group will be represented by the symbolic extension number "twinopti".

While doing the actual configuration both "twincmi" and "twinopti" must be replaced by the actual extension number.

IMPORTANT: On the Personal Device Group master (CMI) device the key layout is important! The Check key should **not** be overwritten by any line-key, otherwise the callback entries of the callback list and the entries in the mailbox list of the CMI and are no more visible.

```
CHANGE-TAPRO:STNO=twincmi,DIGTYP=OPENST10,KY11=LINE; /*CMI*/

ADD-KCSU:STNO=twincmi,TYPE=PRIM,PRIMKEY=11,TWINNING=YES; /
*CMI*/

CHANGE-
TAPRO:STNO=twinopti,DIGTYP=OPENST10,KY01=LINE,KY02=LINE; /
*DIGITE*/

ADD-
KCSU:STNO=twinopti,TYPE=PRIM,PRIMKEY=1,ORLNPF=LAST,TWINNING=YES;
/*DIGITE*/

ADD-
KCSU:STNO=twinopti,TYPE=SEC,KYNO=2,STNOSEC=twincmi,RIOP=YES;
/*DIGITE*/
CHANGE-ZAND:TYPE=KEYSYS,DISLNBAS=YES;
```

8.13.4 Relevant AMOs

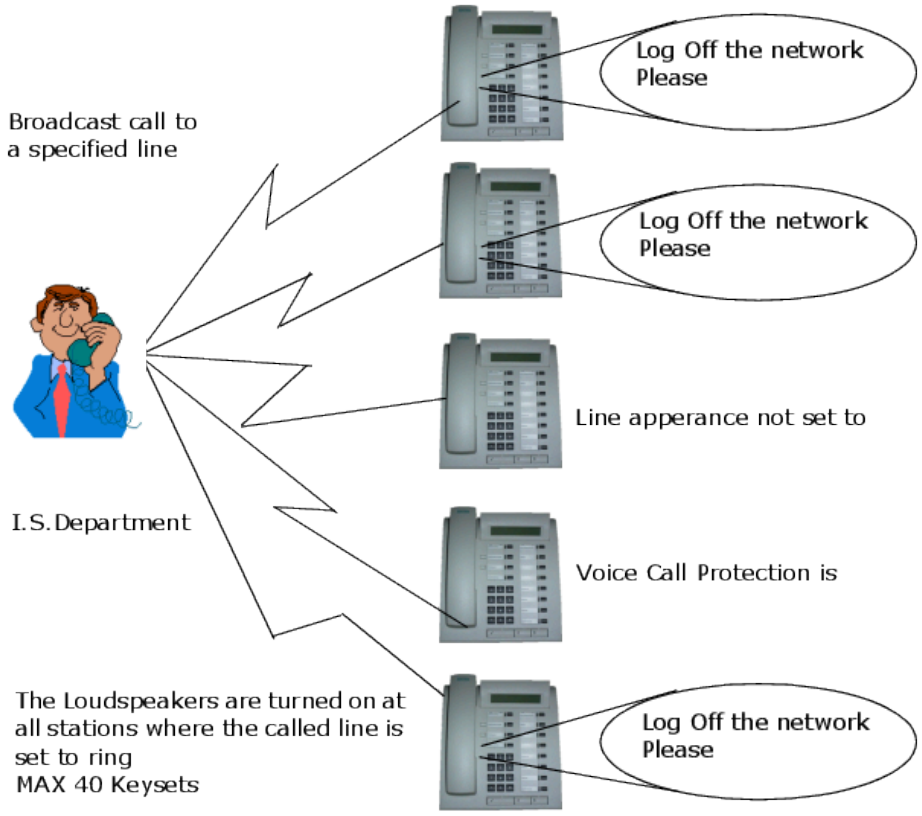
AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COSSU	ESBER=BRK	d	Sprachberechtigung: Briefkasten (Ausleseberechtigung)
	AVCE=MB	e	Voice Classmark: mail box (authorization to receive mail)
CTIME	KDHLDREC	d	Timer für die Dauer des manuellen haltens des Gesprächs
	CTHLDREC	e	Timer to control the duration of a manual hold of a call
KCSU	TWINNING	d	Personal Device Group fuer CMI Geraete aktivieren
	TWINNING	e	Activate Personal Device Group for CMI devices
SBCSU	TLNNU	d	Teilnehmernummer des CMI / Desktop-Endgerätes
	STNO	e	Station number of the CMI / desktop phone
	RRFBK	d	Rückruf im Freifall wird im Briefkasten abgelegt/nicht abgelegt
	CBKNAMB	e	Call back on no answer is stored / not stored in the mailbox
SDAT	EMERK=RULEITNG	d	Rufumschaltung der Leitung erwünscht
	AATTR=RNGXFERL	e	Ring transfer for line desired
TAPRO	TLNNU	d	Teilnehmernummer des CMI / Desktop-Endgerätes
	STNO	e	Station number of the CMI / desktop phone
	TD*=RULEITNG	d	Rufumschaltung für Leitung
	KY*=RNGXFERL	e	ring transfer (for executive/ secretary) key
ZAND	ANZLNBAS	d	Rufnummer und Name der aktiven Line anzeigen anstatt die des zugeordneten Gerätes.

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	DISLNBAS	e	Display station number and subcriber name belonging to the line appearance instead of those belonging to the device hosting the line appearance
ZIELN	TYP=RULEITNG	d	Rufumschaltetaste für Leitungen
	TYPE=RNGXFERL	e	Ring transfer key for lines
	RNRRU	d	Rufumschaltungsziel / -quelle für Leitungen: Teilnehmernummer des CMI / Desktop-Endgerätes
	STNORXFR	e	Ring transfer destination / source for lines
	RUFUNKT	d	Ziel/Quelle der Rufumschaltetaste für Leitungen
	RXFRFCT	e	Function of ring transfer key for lines

8.14 Speaker Call - One-Way - Broadcast

8.14.1 Overview

With the speaker call Broadcast function it is possible to allow the broadcast to multiple loudspeakers.



8.14.2 Feature Description

This feature provides the capability to allow an Analog telephone, Digital Feature Telephone (DFT) or Keyset user to initiate a speaker call with a one-way connection to multiple (maximum 40 keysets) keyset destinations, simultaneously.

Upon one of the destinations answering the Broadcast (by lifting the handset), that user can privately converse with the originator of the Broadcast.

8.14.3 User Interface

- The user may either depress a key (BROADCST) or dial an access code (BROADCST), followed by dialing a destination extension number, to initiate a Broadcast call. A one-way connection shall immediately be established between the user and up to 40 keysets which have a line appearance of the dialed destination and meet the following criteria:
  - The line appearance on the telephone is configured to ring.
  - The station user is not busy, not off-hook, not in hands-free operation, or is not in program mode.
  - The destination is not marked for voice call protection.In default this is on.
  - The station is not restricted from terminating to that destination (e.g. ITR Internal Traffic Restriction).

- An external dial tone shall alert the originator that the one-way connections have been established, and that the one-way Broadcast can begin.
- The Broadcast connection shall be converted to a single two-way connection upon any active Broadcast destination's going off hook, via the handset only. The two-way connection shall be established between the party that initiated the call and the first party that went off hook. All other parties will be released from the call.
- A Speaker Call -- One-way - Broadcast call can be initiated by an analog or digital telephone.
- When a destination party presses the speaker key, the party will be disconnected from the Broadcast (speaker turned off). If the last party presses the speaker key, the call will be disconnected.
- When a destination party presses a line key (either the one on which the Broadcast is pending, or any other line key), the party will be disconnected from the Broadcast (speaker turned off). If the last party presses a line key, the call will be disconnected.
- The number of simultaneous Speaker Call -- One-way - Broadcasts is 10 with 40 members each.
- The destination parties receive a momentary burst of ringing and the calling party remains on the display of the destination parties.

8.14.4 Service information

The Speaker Call - One-Way - Broadcast call feature is intended for the global marketplace.

8.14.5 Generation (Example)

- How to configure the originating station to have access to the Broadcast feature:
  `CHA-SDAT:STNO=7445,TYPE=ATTRIBUT,AATTR=BROADCST;`
- Add the digits for dial access to the Broadcast feature:
  `ADD-WABE:CD=*51,DAR=BROADCST;`
- Add the Broadcast key to a phone:
  `CHA-TAPRO:STNO=7445,KY08=BROADCST;`

8.14.6 Relevant AMOs

AMO	Parameter	Language	Description
WABE	BROADCST	d	rundspruch
	BROADCST	e	speaker call - one way broadcast
TAPRO	BROADCST		rundspruch
	BROADCST	e	speaker call - one way broadcast
SDAT	BROADCST	d	rundspruch
	BROADCST	e	speaker call - one way broadcast

9 Non Voice

9.1 Fax Machine

9.1.1 Feature Description

A fax machine can be configured either as an analog terminal linked to an SLMA module or via an analog adapter at the UP0/E connection, or as a digital terminal linked to an S0 bus. Assign the fax machine a combination call number under which it is generally accessible. The connection is thus a fax connection (FAX service).

9.1.2 Service Information

At the UP0/E connection, a fax machine can be configured via an analog adapter.

IMPORTANT: The fax machine can be accessed internally or externally by means of combination call number (4444) or by the fax code and station number (4321). Since the latter of these alternatives usually results in an unduly long digit sequence for external callers, the combination number must be used. In the case of calls from an ISDN fax machine, the called station must be configured as a fax terminal.

9.1.3 Generation (Example)

- Create digit analysis result:
  `ADD-WABE:CD=key-num,DAR=FAX;`
- Create digit analysis result for the combination call number:
  `ADD-WABE:CD=4444,DAR=FAXNO;`
  - Create a fax machine linked to the SLMA module as follows:

    ```
    ADD-SCSU:STNO=4321,DVCFIG=ANATE&FAX,DPLN=number,
    ITR=number, COS1=number,COS2=number,LCOSV1=number,
    LCOSV2=number,LCOSD1=number, LCOSD2=number;
    ```
- Create digit translation:

  The combination call number (FAXNO) is linked to the internal call number of the fax machine.
  `ADD-RUFUM:TYPE=COMB,FAX1=4444,FAX2=4321;`

9.1.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
RUFUM	TYP	d	Verzweigungsparameter
	TYPE	e	desired conversion table
	FAX1	d	externe FAX-Rufnummer
	FAX1	e	externally dialled facsimile access code
	FAX2	d	interne Rufnummer mit FAX-Anschluss
	FAX2	e	facsimile internal access code
WABE	RNR	d	Rufnummer
	CD	e	access code / station number
	KZP	d	Kennzahlpunkt
	DAR	e	Digit analysis result
	WABE	d	Wabegruppe
	DPLN	e	feature access group / dial plan

9.2 Number Conversion

9.2.1 Feature Description

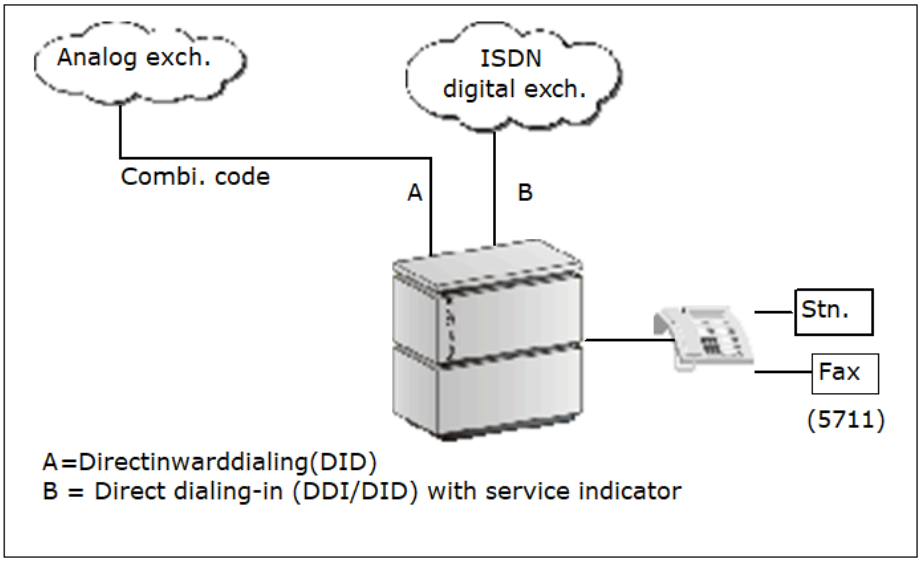


Figure 95: Number conversion

Indialed digit sequences are converted in the following cases:

- Station numbers between 1 and 6 digits (AMO WABE, DAR=STN). The dialed number must always be converted to an assigned station number.
- Conversion of call numbers from the IDN network (1 to 4 digits) (AMO WABE, DAR=STN) ???Conversion is necessary if the internal numbering of the relevant TTX or DTE devices contains more digits than the station number dialed by the IDN network.
- Combination codes for FAX, DTE (AMO WABE, DAR=FAXNO/DTENO). These must be configured in the digit analysis if the service code plus station number in the system contains more than six digits and the service should be accessible from an external location over the exchange, because only six-digit (max.) station numbers are supported for external access. Conversion is always necessary in this case.

The prerequisite is that the access code to which the conversion is to occur is already assigned and is compatible with the code to be converted (service, etc.). There must be no STN configured for the station number to be converted but it must be applied to the DAR STN in the AMO WABE.

IMPORTANT: ADD and CHANGE are performed in the same manner because the AMO RUFUM simply overwrites configured entries in the case of a new add command. Station number:-conversion

---

9.2.2 Example of Station Number Conversion

- Configure the code(s) with:
  ```
  ADD-WABE:CD=7144,DAR=STN;

  ADD-WABE:CD=7145,DAR=STN; /* STN still to be added */
  ```

  IMPORTANT: The code can only be assigned for the CPS 6 and 7 (exchange indial). This means it can be assigned to other DARs in different CPSs. If TYPE= DID is set, the AMO RUFUM only checks for the STN DAR and will accept any CPS.

- Configure number conversion as follows:
  ```
  ADD-RUFUM:TYPE=DID,DID1=7144, DID2=7145;
  ```

  DID1 = direct inward dialing number DID2 = station number to be converted to (station must be assigned under this number)

9.2.3 Combination Code (FAX, DTE)

- Configure the DAR in the DPLN as follows:

  Combination code for FAX
  `ADD-WABE:CD=key-num,DAR=FAXNO;`

  or

  Combination code for DTE
  `ADD-WABE:CD=key-num,DAR=DTENO;`
- Configure number conversion as follows:
  `ADD-RUFUM:TYPE=COMB,FAX1=number,FAX2=number;  or`

  `ADD-RUFUM:TYPE=COMB,DTE1=number,DTE2=number;`

  FAX1, DTE1 correspond to the combination codes (FAXNO, DTENO) in digit analysis. FAX2, DTE2 correspond to the station numbers of the devices in OpenScape 4000

> **IMPORTANT:** Conversion is not possible if the station numbers are identical in the AMO RUFUM, for example, for the parameters FAX1 and FAX2. It is not necessary either because dialing the combination code always sets up a connection to the device with the same station number. All you have to do is set the station number 4711 to DAR=FAXNO under CPS 6 in WABE and set 4711 to DAR=STN for the other CPSs. If the fax device is configured under 4711, it is reached (even if number conversion is not performed) by dialing 4711 in CPS 6 (exchange indial) under DAR=FAXNO.

9.2.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
RUFUM	TYP	d	Verzweigungsparameter
	TYPE	e	desired conversion table
	DUWA1	d	externe Durchwahlrufnummer
	DID1	e	direct digit indial number
	DUWA2	d	interne Rufnummer (fuer Durchwahl)
	DID2	e	internal destination number (for indial)
	DEE1	d	externe DEE-Rufnummer
	DTE1	e	externally dialled data terminal equipment access code
	DEE2	d	interne Rufnummer mit DEE-Anschluss

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	DTE2	e	data terminal equipment internal access code
	FAX1	d	externe FAX-Rufnummer
	FAX1	e	externally dialled facsimile access code
	FAX2	d	interne Rufnummer mit FAX-Anschluss
	FAX2	e	facsimile internal access code
WABE	RNR	d	Rufnummer
	CD	e	access code / station number
	KZP	d	Kennzahlpunkt
	DAR	e	Digit analysis result
	WABE	d	Wabegruppe
	DPLN	e	feature access group / dial plan

10 Terminals

10.1 Automatic Number Identification (ANI)

10.1.1 Feature Description

Up to now the phone number of the caller wasn't shown at the called party, after remote transfer out of PhoneMail. In case of remote transfer (CorNet-N) and if COT-Parameter **ANDY** is set, then the redirectin number (REDIRECTING_NUM) is exchanged to the called number (CALLED_NUM).

Scenario

PRI Trunks come into System A with ANI from phone company.

Call rings an extension in System A. Phone is ring no answer forwarded into PhoneMail (Which is in System B). Caller does 0# to transfer out of PhoneMail and ring another extension in System A. Person Answers phone. Caller is now connected. The person answering the phone gets the ANI of the caller.

10.1.2 Service Information

Prerequisites

The feature is only available with CorNet-N / CorNet-US protocol variant.

10.1.3 Generation

```
CHANGE-COT:<cot-no>,COTTYPE=COTADD,PAR=ANDY;
```

10.1.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
COT	ANDY	d	ANI delivery in gemischten Netzen
	ANDY	e	ANI delivery in mixed networks

10.2 Autoset Relocate

10.2.1 General Information

The Autoset Relocate feature allows users to move their telephones to different locations within the same PABX (i.e. same node in network systems), as required. Anates and UP0 terminals are supported

Users can "sign off" their telephones by dialling an appropriate code followed by their PIN number (only at their own telephone), and can, similarly, "sign on" at any suitable free location (PEN) in the system. The users class of service, group memberships and activated telephone features remain unchanged.

Service engineers can relocate any telephone in a system as follows:

Signing off

- Via dial-up procedure at any suitable telephone in the system (sign off code followed by station number of telephone to be relocated) or
- via dial-up procedure at any suitable telephone in the system (service code followed by station number of telephone to be relocated) or
- via the service terminal (with the device switch et-relocate DSSU).

Signing on

- Via dial-up procedure at the relocated telephone (sign on code followed by station number of relocated telephone) or
- via dial-up procedure at the relocated telephone (service code followed by station number of relocated telephone) or
- via the service terminal with AMO DSSU.

IMPORTANT: The signing on procedure cannot be entered at at remote telephone.

Service Terminal

In addition, the following operations can also be carried out at the service terminal:

- Users/stations can be configured with AMO SCSU / AMO SBCSU in signed off status
- Configured, free (i.e. not occupied) PENs can be signed offf with AMO BCSU
- PENs which are signed off can be re-enabled (signed on) with AMO BCSU
- Users/stations which are signed off can be displayed with AMO SCSU or AMO SBCSU, depending on the device type. All users can be displayed regardless of device type with AMO SDSU.
- PENs which are signed off can be displayed with AMO BCSU and AMO SDSU

The sign off and sign on procedures are functionally seperate procedures, i.e. a service engineer can sign off a telephone via AMO and the user can sign on via the telephone dial-up procedure or vice-versa, as required.

service code

The service code is a special user-independent service PIN, which is administered with AMO PERSI.

10.2.1.1 Terms Used

- Signed off user:

  A signed off station is a station to which no pen (module) is assigned. From a security point of view the status is SIGNED_OFF. In this status the station cannot be reached and cannot execute any action itself with the exception of the following functions:

  – It can sign in on a suitable terminal on a signed signed off pen.
  – It can make an emergency call by entering a specified emergency number.

  Its class of service, group membership etc. remain unchanged. A previously activated FWD remains active.
- Signed on user:

  A signed on user is a user configuration properly assigned to an enabled PEN. The dependability status SIGNED_OFF is not set.
- ID card user:

  An ID card user (anates) is a user without a specific telephone. These users identify themselves by means of their ID card and their PIN at any suitable stations/telephones in the system. Depending on the type of telephone used, such users may not always be able to access the entire range of features for which they are authorized. The device at which an ID card user identifies himself or herself remains configured under its original station number, and is administered with this number.
- Identified ID card user:

  An identified ID card user is an ID card user who has identified himself/herself at a suitable telephone assigned to an enabled PEN. Such a user is regarded by the system as a standard, signed on telephone user in all respects, except that no group memberships (e.g. PU-group or CHESE group) are possible. These users sign off by removing the ID card from the card reader. However, ID card users are not placed in SIGNED_OFF status.
- Signed off PEN:

  PENs with the CONNECTION_TYPE "SIGNED_OFF". For multiple device PENs, the dependability status of a circuit will be MULTIPLE_LINE, and only the CONNECTION_TYPE of the individual TSIs will be SIGNED_OFF (c.f. DISPLAY-SDSU, DISPLAY-BCSU).
- Enabled PEN:

  PENs with a CONNECTION_TYPE other than "SIGNED_OFF". For boards with multiple-device PENs, the CONNECTION_TYPE of the circuit will always be MULTIPLE_LINE, whereas the TSIs can be free, signed off or assigned.

10.2.1.2 Prerequisites for Signing Off and On

1) Requirements for signing off:

- The device type and configuration (e.g. bus) must support the autoset relocate function (see Section 92.2.1, "Anate" and Section 92.2.2, "Digital System Telephone (without second Telephone)").
- The telephone to be relocated must be configured and in operation (if sign off procedure is entered at the same telephone). If the sign off

procedure is entered at a different telephone or via the service terminal, the telephone to be relocated does not need to be in operation.

2) Requirements for signing on:

- The relocated telephone, and the PEN at which it is to be signed on, must be signed off (ID card users cannot sign on at two different telephones/ PENs anyway, see Section 92.1.1, "Terms Used").
- The type of PEN must be suitable for the user configuration to be signed on.

The sign off procedure not only signs off a user configuration, but also the PEN to which it is assigned.

IMPORTANT: Users can only sign on a relocated telephone at a suitable PEN for the user configuration concerned.

10.2.2 Devices and Configurations which support Autoset Relocate

10.2.2.1 Anate

Anates can be signed off and signed on , provided they are configured as follows:

1) Anates as individual telephones (i.e. not associated with other devices);
2) Anates with card readers (ID card user can only sign on);
3) Anates with associated FAX/DTEANA;

IMPORTANT: Anates can only be signed off if configured with the parameter DIAL = VAR (variable). Anates which are configured for pulse dialling or DTMF dialling must be appropriately reconfigured with AMO SCSU, if the board supports the dialling type.

10.2.2.2 Digital System Telephone (without second Telephone)

- If two terminals are connected to the same line, a strict relocate sequence must be adhered to first, the terminator must be relocated and then the repeater can be relocated
- If a functional terminal or CorNet terminal is connected to the Digital system- or IP-telephone via an S0 adapter, the digital phone must be relocated last.

10.2.3 Devices which do not support Autoset Relocate

- HiPath Tradeboard
- HiPath Executive
- Terminals associated with other terminals
- Terminals configured under the main number of an S0 bus, if other terminals are connected under the same number.

- Functional terminals in an S0 bus configuration.
- IP terminals and IP softclients

10.2.4 AMOs Usage Examples for Autoset Relocate

10.2.4.1 Preparations

In order to be able to activate the feature from a suitable terminal, the following conditions must be created first:

- The feature must be enabled.
  `DISPLAY-FEASU;`

  RELOCATE must be listed among the activated features.

  If not, enable the feature with AMO FEASU:
  `CHA-FEASU:TYPE=A,CM=RELOCATE;`
- Sign off and sign on code must be assigned.

  `DISPLAY-WABE:TYPE=GEN,DAR=SIGNOFF&SIGNON;`

  Assign sign off and sign on codes with AMO WABE:

  ```
  ADD-WABE:CD=<kkkkkk>,DAR=SIGNOFF,
  CDDP=<kkkkkk>,CD2=<nnnnnn>,
  CDDP2=<nnnnnn>;
  ```

  CDDP is the code for pulse dialling, i.e. without "*" and "#" keys,

  CD2 is the code for the partner DAR (= SIGNON)

  CDDP2 is the code for pulse dialling for the partner DAR.
- PIN1 and PIN8 (service code) must be assigned.

  `DISPLAY-PERSI:TYPE=STN,STNO=<nnnnnn>;` (PIN1 is used for Autoset Relocate)

  `DISPLAY-PERSI:TYPE=PIN,PINTYPE=8;` (PIN8 = service code)

  Assign PIN1 with AMO PERSI:

  ```
  ADD-PERSI:TYPE=STN,STNO=<nnnnnn>,
  PIN1=<nnnnnnnn>;
  ```

  Assign service code with AMO PERSI:
  `ADD-PERSI:TYPE=SI,SI=<nnnnnnnn>;`

  These conditions are not necessary for signing off and signing on via AMO.

10.2.4.2 Signing Off and On via AMO

10.2.4.2.1 Signing off with DSSU AMO
`CHA-DSSU:TYPE=SIGNOFF,STNO=<nnnnnn>;`
10.2.4.2.2 Signing on with AMO DSSU

```
CHA-DSSU:TYPE=SIGNON,STNO=<nnnnnn>,
```

```
PEN=<nn-nn-nnn-nn>[,TSI=<nn>];
```

IMPORTANT: The TSI (Terminal Selection Identifier) parameter only applies for optiPoint configurations. In optiPoint configurations, the first optiPoint telephone is automatically assigned the TSI 1, and the second is assigned on the remaining TSI, which is intend for optiPoint .

The specified PEN must be located on the correct board type for the telephone concerned. The following table shows which boards are suitable for the individual device types:

Device	Board(s)
optiPoint	SLMO, SLMQ
OpenStage TDM	SLMO24/SLMOP

The AMO BCSUprovides information on PENs or board types, as follows:

Boards:

```
DISPLAY-BCSU:TYPE=TBL,LTG=<nn>,LTU=<nn>,
SLOT=<nnn>;
```

Column 2 of the display output shows whether the PEN is free, assigned or signed off. Signed off users can only be signed on at signed off PENs (or signed off TSIs). If a signed off user needs to be signed on at a free PEN, the free PEN must first be signed off with AMO BCSU (see Section 92.4.3.1, "Signing Off a Free PEN (or TSI) with AMO BCSU").

The AMO SDSU provides more detailed information on the status of the individual PENs (see Section 92.4.5.3, "Display Signed Off Users and PENs with AMO SDSU").

10.2.4.3 Signing Off and Enabling PENs

For SLMA and SLMB boards, the entire circuit is signed off or enabled, i.e. is ignored. For board types with multiple lines assigned to each circuit (SLMO, SLMQ), the TSI parameter is required in order to identify the precise user configuration to be signed off or signed on.

10.2.4.3.1 Signing Off a Free PEN (or TSI) with AMO BCSU

```
CHANGE-BCSU:TYPE=SIGNOFF,[LTG=<nn>],
LTU=<nn>,[SLOT=<nnn>,][TSI=<nn>];
```

10.2.4.3.2 Enabling a Signed Off PEN (or TSI) with AMO BCSU

```
CHANGE-BCSU:TYPE=RELEASE,[LTG=<nn>],
LTU=<nn>,[SLOT=<nnn>],[TSI=<nn>];
```

10.2.4.4 Configuring Users/Stations with SIGNED_OFF Status (without PEN)

Anate

AMO SCSU

optiPoint 500, OpenStage TDM

AMO SBCSU

ADD command, with parameter INS=SIGNOFF

Examples:

1) Configure an Anate with the station number 2224 with SIGNED_OFF status via SCSU:

```
ADD-SCSU:STNO=2224,DVCFIG=ANATE,...,
DIAL=VAR,...,INS=SIGNOFF,...;
```

2) Configure an OpenStage TDM with the station number 3720 as first optiset E with SIGNED_OFF status via SBCSU:

```
ADD-SBCSU:STNO=3720,OPT=OPTI,
CONN=DIR,DVCFIG=OPTISET,...,INS=SIGNOFF,
...;
```

10.2.4.5 Display Signed Off Users and PENs

10.2.4.5.1 Display Signed Off Users with AMO SCSU / AMO SBCSU

- Anate telephones:
  `DISPLAY-SCSU:`
  `[STNO=<nnnnnn&&nnnnnn>,]TYPE=ATTR,ATTR=SIGNOFF;`
- digital telephones:
  `DISPLAY-SBCSU:[STNO=<nnnnnn&&nnnnnn>,]TYPE=SIGNOFF;`

10.2.4.5.2 Display Signed Off PENs with AMO BCSU

`DISPLAY-BCSU:TYPE=PEN,[LTG=<nn>],[LTU=<nn>].[SLOT=<nnn>];`

All the PENs and TSIs (for multiple line circuits) are displayed, together with the appropriate status information (**FREE**, **ASSIGNED**, **SIGNED OFF**)

10.2.4.5.3 Display Signed Off Users and PENs with AMO SDSU

- Users/telephones:

  ```
  DISPLAY-SDSU:[STATUS=SIGNOFF],TYPE=STNO,
  LEVEL=PER3,[STNO=<nnnnnn>],[SVC=<si>];
  ```

- PENs:

  ```
  DISPLAY-SDSU:[STATUS=SIGNOFF],TYPE=PEN,
  LEVEL=PER3,[LTG=<nn>],[LTU=<nn>],
  [SLOT=<nnn>];
  ```

  If the **STATUS** parameter is not specified, the stations or PENs which are out of service are displayed.

10.2.4.6 Emergency calls

If a user wants to make an emergency call from a signed off station ("signed off" appears on the screen), when he lifts the receiver he is assigned a number for this one emergency call from a number pool previously set up for this purpose. The station makes the emergency call and hangs up again. The phone then returns to its original state (automatic sign-off) without requiring any action by the user.

Limitations

An emergency call cannot be made on signed-off analog terminals.

Prerequesites:

- The number pool must be configured (preferably using numbers not already in use).
- The optional patch which determines the emergency number must be activated.

Administration Number Pool

Configuration of maximum 25 stations in the "Signed off" state. This means a maximum of 25 emergency calls can be made simultaneously from signed off stations.

This stations cannot be keysets or ACD agents and cannot be member of a group (e.g. pickup group, CHESE, hunt group, etc.).

```
ADD-WABE:CD=number,.....,DAR=STN;

EINR-WABE:RNR=nummer,.....,KZP=TLN;

ADD-SBCSU:STNO=number,OPT=OPTI,.....,
INS=SIGNOFF.....;

EINR-SBCSU:TLNNU=nummer,OPT=OPTI,.....,
INBETR=ABGEM...;

CHANGE-SDAT:STNO=number,TYPE=ATTRIBUT,
AATTR=EMERGPLN;

AEND-SDAT:TYP=MERKMAL,EMERK=NOTRFPLN;
```

New advisory message from AMO SDAT

F63: Only signed off subscribers can be configured to the pool of Emergency Call numbers

F63: Es koennen nur abgemeldete Teilnehmer in den Notruf-Nummern-Pool konfiguriert werden

F64: Only a maximum of 25 signed off subscribers can be configured to the pool of Emergency Call numbers

F64: Es koennen nur max. 25 abgemeldete Teilnehmer in den Notruf-Nummern-Pool konfiguriert werden

10.3 Babyphone

10.3.1 Feature Description

As soon as this feature is activated a room can be monitored from any telephone configured in the same PBX. The feature is activated from the telephone in the room that is to be monitored. For activation a code with a maximum of 21 digits must be entered which may only be known to the activating person. Monitoring remains active until the handset of the telephone in the monitored room is placed on-hook or the loudspeaker is switched off. To activate the actual monitoring process the telephone in the monitored room is called, then the feature code and the secret code number can be entered. Only the receive channel is switched through for monitoring purposes.

10.3.2 Service Information

- This feature is not available network-wide.
- This feature **cannot** be centrally disabled or enabled.

10.3.3 User Interface and Operation

10.3.3.1 Activation

Take off the handset > dial the feature code > dial the code number ending with # .

10.3.3.2 Deactivation

Place the handset on-hook or switch off the loudspeaker.

10.3.3.3 Monitoring the room

From any telephone configured in the same PBX:

Call the station where the feature is activated. After the busy tone dial BABYUEBW and enter the code number ending with #. The receive channel is switched through after the positive acknowledgement tone.

10.3.4 Generation (Example)

You can configure a code for babyphone feature as follows:

	You can only administer the digit analysis result **BABYLSNG** (with * or #) in expert mode. Expert mode > ComWin > Open ...< IP> using AMO (see AMO command).
	Use the AMO WABE to configure the digit analysis result: `ADD-WABE:CD=**99,DAR=BABYLSNG;`

10.3.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
WABE	RNR	d	RUFNUMMER
	CD	e	ACCESS CODE / STATION NUMBER
	KZP	d	KENNZAHLPUNKT
	DAR	e	DIGIT ANALYSIS RESULT

10.4 Block Dialing

10.4.1 Feature Description

It is possible to enter call numbers and to modify them before dialing. The digits are collected firstly but not yet evaluated by the system.

It is possible

- to delete digits in the selected string,
- to insert digits or
- to complete the string.

Start of the dialing:

- LCR-we timer is started with any entered digit and with timeout the call is processed.
- With **Ok** key the call is started immediateately.

10.4.2 Service Information

- Block-Dialing is possible in onhook and offhook state.
- During predialing now "DIAL ?" is shown in the display. The cursor is not shown.
- +/- key are not relevant anymore.
- With the left key digits are deleted.

10.4.3 Generation

AMO LDPLN

The AMO LDPLN should be configured with call complete. That means the LCR digit pattern has to be configured as **0-w-123-Z** instead of 0-w-123-X.

This is important in case of using ANATE or Fax.

Activation:

```
CHANGE-ZANDE:TYPE=OPTISET,EDITDIAL=YES;

CHANGE-ZANDE:TYPE=DATENALL,SIPDIAL=YES;
```

10.4.4 Relevant AMOs

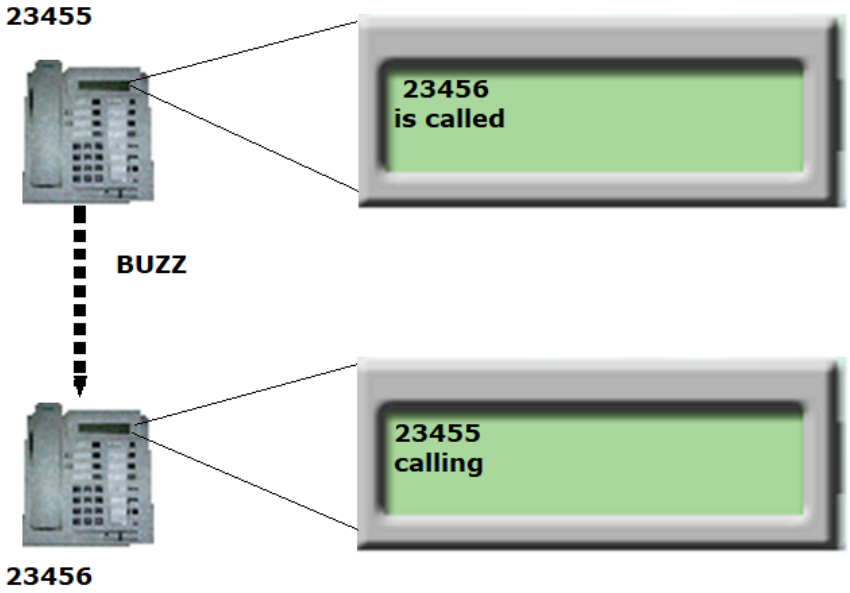
AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
LDPLN	LWM	d	LCR-Wählmuster (Z: für eine beliebige Ziffernfolge, gefolgt von Timeout oder # (= Wahlendezeichen))
	LDP	e	LCR digit pattern (Z: for any digit sequence followed by timeout or # (=end-of-dial character))
	REMKZ	d	Remote Knotenkennzahl
	REMAC	e	remote access code
	REMGRUNU	d	Remote Gruppennummer
	REMGRNO	e	remote group number
	SIGNAL	d	Signalisierungsmodus (ALLE, KEINE, LED)
	SIGNAL	e	signaling mode (ALL, NONE, LED)
	REMSIGAB	d	Remote Signalisierung abgehend
	REMSIGO	e	remote signaling outgoing
	REMSIGAN	d	Remote Signalisierung ankommend
	REMSIGI	e	remote signaling incoming
	REMSIGPK	d	Remote Signalisierung fuer Parken
	REMSIGPK	e	remote signaling for parking

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
COSSU	SGAUN	d	Sperren der gezielten Anrufuebernahme
	BDCP	e	blocking of directed call pickup
	UUS1IM	d	Nutzung des Dienstes uus1 implizit
	UUS1IM	e	use of user - user signaling 1 implicit
DIMSU	REMAUNGR	d	Anzahl der AUN-Gruppen in fremden Knoten
	REMPUGR	e	number of pickup groups in remote nodes
COP	ASEG	d	CorNet-NQ Facility Segmentierung ausschalten
	ASEG	e	switch off CorNet-NQ facility segmentation
COT	ETSC	d	Nur ETSI USS3 protokollkonforme Meldungen werden zugelassen
	ETSC	e	UUS ETSI conform
	NQPI	d	CorNet-NQ Pickup-Info nicht unterstützt
	NQPI	e	CorNet-NQ Pickup-Info not supported.
	NQNP	d	CorNet-NQ Netzweite Übernahme nicht unterstützt.
	NQNP	e	CorNet-NQ Network-wide Pick-up not supported.
	UUS1	d	User to user implizit (kommend)
	UUS1	e	UUS Service Class 1 (Connection Setup Basic Call)
	UUSC	d	UUS3 Begrenzung der Datenmenge
	UUSC	e	Congestion Control for User-User Service
CTIME	GPUNST	d	Netzweiter AUN TSC-Abbruch Timer
	GPUNST	e	network-wide group pick-up tsc teardown timer
	UUS3T1	d	Maximale Wartezeit auf eine Antwort(Netzwerkseite)

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
	UUS3T1	e	uus3 request started on called network
	UUS3T2	d	Zeiteinheit für maximale Meldungen pro Zeiteinheit
	UUS3T2	e	uus3 info message started on net side
FEASU	DIRAUN	d	Direkte Anrufübernahme
	DIRCPCKP	e	directed call pick up
TDCSU	UUSCCY	d	Anzahl von Meldungen die pro Zeiteinheit (UU3T2) bis zum Maximum (UUSCCX) aufgestockt wird.
	UUSCCY	e	UUS congestion control Y
WABE	AUNGANZ	d	Anzeige der Gruppen AUN Information anfordern
	PUGDIS	e	display group pickup information on request
	AUNGEZ	d	Gezielte Anrufuebernahme
	PUDIR	e	directed call pickup
ZAND	UUS	d	DIVUUS Umlenkung erlaubt NODIV Umlenkung verboten DIVSUP Umlenkung abhängig von der Berechtigung
	UUS	e	User-User Signalling for DSS1 Devices

10.5 Buzz

10.5.1 Feature Description



The Buzz feature makes it possible to alert a party without a speech connection. The buzzed party gets an audible signal and the display shows the number and name of the buzzing party. The originator's display shows number and name of the buzzed party.

10.5.2 User Interface

The Buzz can be initiated by pressing the buzz key or by dialing an access code.

If the Buzz key is pressed the Buzz ring acknowledges the successfully signalling of the buzzed party.

When the access code is dialed, the initiator gets a positive acknowledge tone.

In each case if the Buzz is not carried out, e.g. because there is no destination administered or the target's status does not allow a Buzz, the initiating party gets the display 'Buzz not possible'. If the Buzz was initiated by the access code, the buzzing party gets the display and a negative acknowledge tone. The Buzz key can be used nearly independant from the device status, e.g. while a call ist established or while the telephone is ringing and further more situations. The target device can be buzzed in almost the same manner. Multiple Buzz in a short time can be initiated, especially if the Buzz key is used.

10.5.3 Service Information

- The Buzz can be performed on devices of the Optipoint family only. For other device types the Buzz request will rejected.
- The Buzz can be performed in the own node only.
- Only one Buzz destination is allowed for each party, but the same Buzz destination for different parties is possible.

10.5.4 Generation (Example)

- Administer a Access Code for Buzz:
  `ADD-WABE:CD=< >,DAR=BUZZ;`
- Administer the Buzz Key :
  `CHA-TAPRO:STNO=< >,DIGTYP=OPTIT12,KY12=BUZZ;`
- Administer the Buzz Destinaion:
  `ADD-ZIEL:TYPE=BUZZ,SRCNO=< >,DESTNOBZ=< >;`

10.5.5 Relevant AMOs

AMO	Parameter	Language	Description
WABE	BUZZ	d	rufen (warnton) einer bestimmten rufnummer
		e	alert (buzz) a target station
TAPRO	BUZZ	d	buzz einer bestimmten rufnummer
		e	buzz a predetermined number
ZIEL	BUZZ	d	buzz-ziel
		e	buzz destination
	QLRUFNU	d	quellen-rn
	SRCNO	e	station number of source
	BUZRUFNU	d	ziel-rufnummer fuer buzz
	DESTNOBZ	e	dest. no. for buzz

10.6 Call Forwarding

10.6.1 Feature Description

For each service (DTE, FAX, VOICE), you can assign a forwarding destination to a phone number. You cannot assign a forwarding destination to attendant consoles and special stations. The different criteria for call forwarding are explained in the following.

There are three different types of forwarding:

- Variable Call Forwarding
- Fixed Call Forwarding
- System Call Forwarding

There are also the following types of call forwarding which are assigned to the above-mentioned FWD types according to Table 57 on page 96, Forwarding types. You can program destinations for these.

- Unconditional call forwarding (FWD/CFU)
- Call forwarding if busy (CFB)
- Call forwarding if no response after timeout (CFNR)
- Call forwarding if do not disturb (CFDND)

IMPORTANT: Call forwarding type CFDND: Do-not-disturb is a separate feature that you activate with the do-not-disturb button on the station device. If you want all calls to be forwarded in this state, configure and activate a forwarding destination for SYSTEM in CFDND. This forwarding runs only when do-not-disturb is activated.

Furthermore, there are two types of forwarding that do not have separate destinations defined:

- Call deflection, forced forwarding (CD), always uses the CFNR destination. (This type of forwarding allows you to activate the FWD action during the call by pressing the FWD key or disconnect key on the telephone.)
- Delayed Call Forward Busy (DelCFB) always uses the CFB destination. (This type of forwarding has only been implemented for optiPoint telephones and requires the parameter DCFWBUSY. If this is set, camp-on automatically occurs at busy stations that are called and, after some time has expired, call forwarding on busy (CFB) occurs.)

Another possibility for some types of forwarding is to make a distinction based on the type of incoming connection. For example, an external connection is forwarded to a different destination than an internal incoming connection.

The following table illustrates the forwarding assignments

Table 55: Forwarding types

	CFU	CFB	CFNR	CFBNR	CFDND
Variable (IM and US)	INT EXT GEN	GEN	GEN	GEN	-----
Fixed (not US)	GEN	-----	-----	-----	-----
System (IM and US)	INT EXT GEN	INT EXT GEN	INT EXT GEN	------	INT EXT GEN

CFBNR defines only a common destination for CFB and CFNR but is not a separate type of forwarding. "GEN" means the same destination for internal and external calls.

IMPORTANT: For functional terminals according to DSS1 protocol, forwarded calls that are programmed according to the protocol are shown under variable forwarding. For this reason, it is also not restricted to only one variable forwarding destination

at a given time the way other station devices are (see Section 96.2.1, "Variable Call Forwarding")

Important Information for USA

In the USA, only the variable and system FWD types are used. To keep the fixed FWD out of the station device interface, you must set the parameter for the user interface without fixed forwarding in the central system data. As a result:

- The system does not offer fixed FWD in the optiPoint menu
- No FWD information is displayed when in the idle state
- FWD-LED signaling also occurs for the variable CFB and CFNR

When the system is delivered, the parameter CFUI is set to "YES".

Destinations can be:

- Configured subscribers and MASTER HT for each service
- Hunt group code for each service
- Personal station number of attendant console on voice
- Attendant console call queue (M key) only for voice
- Attendant group access code of attendant group
- Multiple code calling/paging with "meet me" (that is, you must configure search code and attendant code)
- Announcement via TCOM (adapter set for special equipment)
- Server for the particular service
- External destinations

There must be an allowed connection from the subscriber or MASTER HT to the call forwarding destination. With the parameter ITRFWD, you can centrally define whether there should be a check of the connection from the caller to the forwarding destination when there is a call.

In principle, all call forwarding actions can be chained. You can configure this centrally with parameters.

You must provide enough memory for the forwarding destinations.

10.6.2 User Interface

IMPORTANT: The forwarding destination number must be terminated with "#" when dialling in the voice function. If "#" is not dialed then the validation of the number starts only after time-out. In the service function there is no time-out. Destination number can be terminated by "#" or by selecting the menu option "save?"

10.6.2.1 Variable Call Forwarding

You can enter destinations for variable forwarding from the station device. Entering a destination automatically activates it. Deleting a destination automatically deactivates it. You can configure variable call forwarding

- from the station device

  or
- with AMO ACTDA or Configuration Management

You can configure variable call forwarding for optiPoint via the service menu and for Anate and functional terminals via code. Configure the digit analysis results in digit analysis.

With two exceptions, you can always program only one variable forwarding destination. The exceptions are:

1) CFU can simultaneously have an internal and an external destination
2) You can enter a destination for each type of forwarding for functional terminals with DSS1 protocol

10.6.2.2 Fixed Call Forwarding

You can enter, activate, deactivate, or delete one fixed forwarding destination from the station device. When you enter and save the destination from the station device, the forwarding is activated. When you enter the destination with the AMO ZIEL, it is not automatically activated. Disabling a destination does not automatically delete the destination entry. Activate it separately.

Program and delete fixed call forwarding

- from the station device

  or
- with AMO ZIEL or Configuration Management

Activate or deactivate fixed call forwarding

- from the station device

  or
- with AMO ACTDA or Configuration Management

You can configure fixed call forwarding for optiPoint via the service menu or with codes; you must use codes for Anate and functional terminals. Configure the digit analysis results with the AMO WABE or Configuration Management.

10.6.2.3 System Call Forwarding

You cannot enter any forwarding destinations for this type of forwarding from the station device. You must use AMO ZIEL or Configuration Management. You can only activate or deactivate it by code from the station device or by using AMO ACTDA or Configuration Management.

A special feature is that you cannot activate the type of forwarding (CFU or CFB, for example) for each separately, but must do all at once. If you later add a destination for a type of forwarding, it is automatically activated if this type of forwarding was activated for the previously entered destination.

Example:

You have entered and activated a CFNR destination for CFVAR=SYSTEM. If you later enter a CFB destination, it is automatically activated.

10.6.2.4 Call Forwarding/Call Forwarding Busy

If ZAND reserve parameter 124 is not acrtivated the fixed forwarding destination is not used for executing the **CFNR** or **CFB**. If system call forwarding is defined, it is used.

If ZAND reserve parameter 124 is activated, the fixed forwarding destination is used on an individual subscriber basis like in earlier versions, depending on the COS parameters **CFNR** and **CFB**.

10.6.2.5 Call Forwarding Unconditional

B has se call forwarding unconditional to C. C has call forwarding unconditional to B.

When A calls B , C will ring even C has set CFU to B.

If B should ring you must set reserve switch 124 in AMO ZAND.

10.6.2.6 Chaining FWD Types

The diversion sequence table (DIST) defines how often a type of forwarding can be performed in one connection. The table also defines which types of forwarding can be chained together. The table is centrally administered.

There are ten such entries that are permanently assigned to the different types of station devices. You can see the assignment in the information field of the individual entries. (for example: DISPLAY-ZAND: TYPE=DIST).

Table 56: Diversion Sequence Table Device Types

IDX	Device type
1	Analog telephones
2	Functional terminals
3	Digital station devices
4	Hunt group
5	Attendant console
6	Analog trunks
7	Digital trunks (protocol /= ECMA-QSIG)
8	Digital trunks (protocol = ECMA-QSIG or ECMAV2)
9	Digital trunks to central office
10	Free (no assignment)

For one of the ten possible entries in the **DIST**, the following table shows. In this case, the following would be possible:

- 10 x CFU
- 1 x CFB, CFNR, or CD
- Chaining is only allowed for CFU to CFU

Table 57: DIST

		CFU	CFB	CFNR	CD
10	CFU	X			
1	CFB				
1	CFNR				
1	CD				

The DIST treats the new type of forwarding, CFDND, the same as CFB.

The DIST treats DelCFB, the other new type of forwarding, like CFNR.

The parameter FWDMAX still defines the total number of forwarding entries, regardless of the type.

If the last forwarding is to the VMS, you can use the parameter FWDVMS1 to define whether the forwarding should be done to the mailbox of the first called or to the last forwarded.

When you program a variable FWD, an activated fixed FWD is deactivated, but a FWD System not. The variable FWD is executed. If you deactivate this, the system executes a previously activated FWD System.

If a variable FWD is activated and you program and activate a fixed FWD, the variable FWD is deleted.

10.6.3 Generation (Example)

The following contains lists of sample commands for the different AMOs in question:

10.6.3.1 AMO ACTDA

- Activating the FWD for FWD type SYSTEM for voice:

	Configuration Management --> Line --> Station, enter station number and click Search. In the Call Forwarding tab, select the forwarding type and variant. Then select and save.
	Activate call forwarding with the AMO ACTDA: `ADD-ACTDA:TYPE=STN,STNO=3240,FEATCD=FWD,CFVAR=SYSTEM,SI=VCE;`

- Configuring a variable FWD for CFU with a common destination for internal and external calls:

	Configuration Management --> Line --> Station, enter station number and click Search. In the Call Forwarding tab, select the forwarding type and variant. Then select and save.
	Activate call forwarding for CFU with the AMO ACTDA: `ADD-ACTDA:TYPE=STN,STNO=3280,FEATCD=FWD,CFVAR=STATIONV,DTYP`

10.6.3.2 AMO COSSU

Relevant authorizations:

- FWDBAS Release the FWD for programming by other subscribers
- FWDFAS Programming a FWD for other subscribers
- FWDDIR Activate or deactivate and query FWD for incoming
- CFNR Call forwarding when there is no answer (SMR09 and later or PRB for SMR08)
- CFB Call forwarding when busy (SMR09 and later or PRB for SMR08)

	Configuration Management --> Tables --> Class of Service, enter COS and click Search. In the Voice 1 tab, select the parameter FWDDIR, for example, and save.
	Add authorizations with the AMO COSSU: `CHANGE-COSSU:TYPE=COS,COS=<cos number>,AVCE=<e.g. FWDDIR>;`

10.6.3.3 AMO COT

Relevant parameters, new:

- CDN Call forwarding during the ringing phase throughout the network
- CFBN Call forwarding when busy throughout the network

	Configuration Management --> System Data --> Trunk --> Class of Trunk (COT), enter COT and click Search. In the Parameter 2 tab, select the parameter CDN, for example, and save.
	Add values using the AMO COT: `CHANGE-COT:COTNO=<cot number>,COTTYPE=COTADD,PAR=<CDN>;`

Relevant parameters, old:

- CFOS Call forwarding possible network-wide
- CFBU Call forwarding on busy with new setup of the connection to the forwarding destination throughout the network
- FWDN Release rerouting for network-wide call forwarding to source node (cannot be used at the same time as CFBU)

- FWDR Call forwarding is done using rerouting in the public network (application for France)
- FAX1 Call forwarding of incoming FAX trunk calls to phonemail
- FAX2 Call forwarding of incoming FAX trunk calls to phonemail
- NCTP The partner node can execute network-wide call forwarding after transfer
- CFVA Activate connectivity validation for call forwarding destinations in network
- FNAN Activate rerouting for network-wide call forwarding to source node
- XFER Forwarding trunk call

10.6.3.4 AMO DIMSU

Define size of the memory for FWD destinations and for forwarding follow-me

	You can only administer the memory values in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	To change the memory using the AMO DIMSU: `ADD-DIMSU:TYPE=USER,CFWDEST=<e.g. 100>,CFWHIST=<e.g. 100>;`

Guidance value for dimensioning: One pool element per STN and forwarding type. Additional pool elements for separate destinations for internal and external. Example: If all possibilities are used for a STN according to Table 1, you need 9 pool elements if you enter common destinations for internal and external calls.

10.6.3.5 AMO TDCSU

Parameter FWDX Maximum number of call forwarding entries (FWDMAX) in the partner system.

You only need this parameter for ECMA-QSIG or EURO-ISDN protocol (see PROTVAR parameter). For ECMA-QSIG protocol, you should not set this value to more than 5.

	Configuration Management --> System Data --> Trunk --> Trunk, click Search and select the circuit. In the Digital Extensions tab, change and save the value for the call forwarding entries.
	To change the call forwarding entries using the AMO TDCSU: `CHANGE-TDCSU:PEN=<LTG-LTU-SLOT-PORT>,FWDX=<number>,DEV=<device>,BCGR=<B channel group number>;`

10.6.3.6 AMO WABE

Administering digit analysis results for call forwarding:

10.6.3.6.1 FWD Fixed

- DAR for programming and activating for voice:

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **AFFWDVCE** as the dial code type.
	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **AFFWDVCE** as the dial code type.

- DAR to deactivate and delete for voice:

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **DFFWDVCE** as the dial code type.
	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **DFFWDVCE** as the dial code type. Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=#51,DAR=DFFWDVCE,CHECK=NO;` (or configure both with one command) `ADD-WABE:CD=*51,DAR=AFFWDVCE,CD2=#51;`

- DAR to activate for voice:

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **AFWDVCE** as the dial code type.
	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **AFWDVCE** as the dial code type. Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=*41,DAR=AFWDVCE,CHECK=NO;`

- DAR to deactivate for voice:

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **DFWDVCE** as the dial code type.
	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **DFWDVCE** as the dial code type. Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=#41,DAR=DFWDVCE,CHECK=NO;` (or configure both with one command) `ADD-WABE:CD=*41,DAR=AFWDVCE,CD2=#41;`

- Digit analysis results for non-voice DFFWDFAX/DFFWDDTE (deactivate FAX/DTE)

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **DFFWDFAX** or DFFWDDTE as the dial code type.
	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **DFFWDFAX** or DFFWDDTE as the dial code type. Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=*61,DAR=DFFWDFAX,CHECK=N ADD-WABE:CD=*71,DAR=DFFWDDTE,CHECK=NO;`

- Digit analysis results for non-voice AFFWDFAX/AFFWDDTE (program and activate FAX/DTE)

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **AFFWDFAX** or AFFWDDTE as the dial code type.
	Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=*81,DAR=AFFWDFAX,CHECK=N; ADD-WABE:CD=*91,DAR=AFFWDDTE,CHECK=N;`

10.6.3.6.2 FWD Variable

- DAR for programming and activating internal or external

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **AULFEXIN** as the dial code type.
	Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=*42,DAR=AULFEXIN;`

- DAR to activate CFU, external

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **AFWDEXT** as the dial code type.
	Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=*43,DAR=AFWDEXT,CHECK=N;`

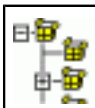
- DAR to deactivate CFU, external

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **DFWDEXT** as the dial code type.
	Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=#43,DAR=DFWDEXT,CHECK=N;` (or configure both with one command) `ADD-WABE:CD=*43,DAR=AFWDEXT,CD2=#43;`

- DAR to activate CFU, internal

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **AFWDINT** as the dial code type.
	Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=*44,DAR=AFWDINT,CHECK=N;`

- DAR to deactivate CFU, internal

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **DFWDINT** as the dial code type.

	Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=#44,DAR=DFWDINT,CHECK=N;` (or configure both with one command) `ADD-WABE:CD=*44,DAR=DFWDINT,CD2=#44;`

- DAR to activate CFBNR

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **AFWDBNA** as the dial code type.
	Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=*45,DAR=AFWDBNA;`

- DAR to activate CFB

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **AFWDB** as the dial code type.
	Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=*46,DAR=AFWDB;`

- DAR to activate CFNR

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **AFWDNA** as the dial code type.
	Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=*47,DAR=AFWDNA;`

- DAR to deactivate CFB, CFNR, CFBNR, CFU

  Use the same DAR to simultaneously deactivate all FWD types as for FWD fixed.
- Digit analysis results for non-voice AFWDFAX/AFWDDTE (activate FAX/DTE)

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **AFWDFAX** as the dial code type.
	Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=*48,DAR=AFWDFAX;`

- Digit analysis results for non-voice DFWDFAX/DFWDDTE (deactivate FAX/DTE)

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **DFWDFAX** as the dial code type.

	Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=*49,DAR=DFWDFAX;`

10.6.3.6.3 FWD System

- DAR to activate

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **ASYSFWD** as the dial code type.
	Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=*60,DAR=ASYSFWD,CHECK=N;`

- DAR to deactivate

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save **DSYSFWD** as the dial code type.
	Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=#60,DAR=DSYSFWD,CHECK=N;` (or with a command) `ADD-WABE:CD=*60,DAR=ASYSFWD,CD2=#60;`

10.6.3.6.4 Special Digit Analysis Results

- AFWDREM/DFWDREM (activate or deactivate for remote/follow me)
- FWDTERM (terminal call forwarding)
- AFWDDWD (FWD activate for digits without display)
- FFWDREMK (saving a FWD fixed remotely via key)
- FWDREM (display of the FWD remote/follow me)
- FWDIGNOR (ignore call forwarding)
- FWDKY (program key function FWD key)

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code and select and save a digit analysis result as the dial code type.
	Configuring a digit analysis result using the AMO WABE: `ADD-WABE:CD=<keyed_num>,DAR=<special digit analysis point>;`

10.6.3.7 AMO ZAND

- Fixed forwarding destination is CFNR destination

	You can only configure the identifier "Fixed forwarding destination is CFNR destination" in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).

	Using the AMO ZAND, configure the identifier "Fixed forwarding destination is CFNR destination": `CHANGE-ZANDE:TYPE=ALLDATA2,CFABLOOP=YES;`

- Set number of chained call forwarding instructions to a maximum of 10

	You can only configure the number of chained call forwarding instructions in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	Use the AMO ZAND to configure the number of chained call forwarding instructions: `CHANGE-ZAND:TYPE=ALLDATA2,FWDMAX=10;`

- Set up user interface without fixed forwarding for USA

	You can only administer setting the menus for call forwarding in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	Using the AMO ZAND, set the menus for call forwarding: `CHANGE-ZAND:TYPE=ALLDATA3,CFUI=NO;`

- A maximum of 5 CFU call forwarding instructions should be possible for optiPoint after no answer:

	You can only configure the number of maximum call forwarding instructions in expert mode. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	Use the AMO ZAND to configure the number of call forwarding instructions: `CHANGE-ZAND:TYPE=DIST,DIVSQIDX=3,DIVTYPE=CFU,MAXDIVNO=5,ALLDI`

Table 58: Result of the Entry in the DIST Table

		CFU	CFB	CFNR	CD
5	CFNR	X			

DIVSQIDX=3 is intended for the optiPoint devices.

10.6.3.8 AMO ZIEL

- Enter a destination for internal calls for FWD variable system, forwarding type CFU.

	Configuration Management --> Line --> Station, enter station number and click Search. In the Call Forwarding tab, select the forwarding type and variant and save with destination number.
	Use the AMO ZIEL to configure call forwarding: `ADD-ZIEL:TYPE=FWD,SRCNO=3240,SI=VCE,DESTNOF=3241,DTYPE=CFU,CFVAR=SYSTEM;`

- Configure and activate a call forwarding destination for internal and external calls

	Configuration Management --> Line --> Station, enter station number and click Search. In the Call Forwarding tab, select the forwarding type and variant and save with destination number.
	Use the AMO ZIEL to configure call forwarding: `ADD-ZIEL:TYPE=FWD,SRCNO=4711,SI=VCE,DESTNOF=2100,DTYPE=CFNR,ITY` `ADD-ACTDA:FEATCD=FWD,CFVAR=SYSTEM,SI=VOICE;`

- Configure destination for fixed FWD

	Configuration Management --> Line --> Station, enter station number and click Search. In the Call Forwarding tab, select the forwarding type and variant and save with destination number.
	Use the AMO ZIEL to configure call forwarding: `ADD-ZIEL:TYPE=FWD,SRCNO=5700,DESTNOF=3333,DTYPE=CFU,ITYPE=GEN,C`

10.6.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
ACTDA	AULVAR	d	Umleitungsvariante (variable, ...)
	CFVAR	e	call forwarding variant (variable, ...)
	UART	d	Umleitungsart (CFU, ...)
	DTYPE	e	Diversion type (CFU, ...)
	KART	d	Art der kommenden Verbindung
	ITYPE	e	incoming seizure
	SI	d	Service
	SU	e	service indicator
	ZLRUFNU	d	Rufnummer des Umleitungsziels
	DESTNO	e	forwarding destination number
DIMSU	AULZIEL	d	Anzahl der Poolelemente zum Speichern von Umleitungszielen
	CFWDEST	e	number of call forwarding destinations

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	AULHIST	d	Anzahl der Poolelemente zum speichern von Einträgen der Umleitungshistory. Ist dieses Pool nicht eingerichtet, funktioniert zwar die Umleitung, aber die Maximalwerte der einzelnen Umleitungstypen aus der Umleitungs Folge Tabelle können nicht überprüft werden.
	CFWHIST	e	number of elements for call forwarding history
TDCSU	AULX	d	Legt fest, wie oft eine Verbindung maximal umgeleitet werden darf um über diese Leitung verbunden zu werden
	FWDX	e	
ZAND	AULMAX	d	Legt die Gesamtzahl der erlaubten Umleitungen, unabhängig vom Typ, fest.
	FWDMAX	e	
	AULVMS1	d	Legt fest, ob die Umleitung ins Postfach der Erstgerufenen oder des zuletzt Umleitenden erfolgen soll wenn die Umleitung zum VMS führt.
	FWDVMS1	e	
	UMLENIDX	d	Gerätespezifischer Index
	DIVSQIDX	e	Diversion Sequence Table Index
	UMART	d	Umleitungsart
	DIVTYPE	e	Diversion type that a diversion can follow.
	MAXANZUM	d	Anzahl, wie oft der durch UMART definierte Typ in einer Verbindung maximal durchgeführt werden darf
	MAXDIVNO	e	
	ERLUMART	d	Umleitungsart, die der durch UMART definierte Typ in einer Verbindung folgen darf
	ALLDIVTY	e	Allowed diversion types to follow a specific diversion, defined with DIVTYPE

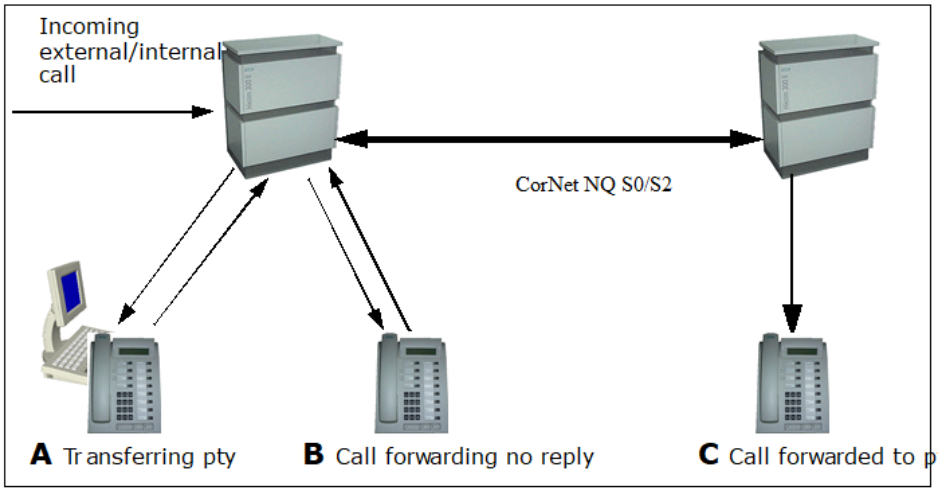
AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	CFUI	d	Anrufumlenkung Benutzeroberfläche mit/ohne feste Umleitung vom Endgeraet
	CFUI	e	Call forward user interface with/without station fix forwarding.
ZIEL	QLRUFNU	d	Rufnummer des Teilnehmers, für den eine 'Umleitung programmiert wird
	SRCNO	e	
	SI	d	Service
	SI	e	service indicator
	ZLRUFNU	d	Rufnummer des Umleitungsziels
	DESTNOF	e	destination number for forwarding
	NAME	d	Name des Umleitungsziels. Nur relevant für netzweite oder externe Teilnehmer
	NAME	e	
	UART	d	Umleitungsart (CFU, ...)
	DTYPE	e	
	KART	d	Art der kommenden Verbindung
	ITYPE	e	incoming seizure of fwd feature
	AULVAR	d	Umleitungsvariante (variable, ...)
	CFVAR	e	call forwarding variant
WABE	AULEEXIN	d	Anrufumleitung einschalten ext und int
	AFWDEXIN	e	activate call forwarrding external and internal
	AULEEXT	d	Anrufumleitung einschalten extern
	AFWDEXT	e	activate call forwarding external
	AULEINT	d	Anrufumleitung einschalten intern
	AFWDINT	e	activate call forwarding intern
	AULEBKA	d	Anrufumleitung einsch. besetzt oder keine antwort
	AFWDBNA	e	activate call forwarding busy or no answer

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	AULEKA	d	Anrufumleitung einschalten keine antwort
	AFWDNA	e	activate call forwarding no answer
	AULSYSE	d	Anrufumleitung system einschalten
	ASYSFWD	e	activate system call forwarding

10.7 Call Forward no Reply (CFNR)

10.7.1 Call Forward no Reply after Transfer

10.7.1.1 Feature Description



An incoming call for A (station or AC) is transferred to party B . Party B has configured call forwarding no reply to party C. Upon expiration of the call forwarding no reply timer, the call is forwarded to party C. If necessary, a recall to A is carried out.

10.7.1.2 Service Information

The feature is available to all users in a PBX.

10.7.1.3 Interaction with other Features

- In the case of CFNR during a recall to the AC or during an attendant intercept (parallel call), the call to the AC is terminated and CFNR is carried out.
- CFNR for interworking with DPNSS1 (redirecting service).
- Multiple hop interactions with CFNR, call forwarding unconditional and call forwarding busy.
- CFNR after transfer from a second consultation call.

10.7.2 Call Forward No Reply and Rerouting

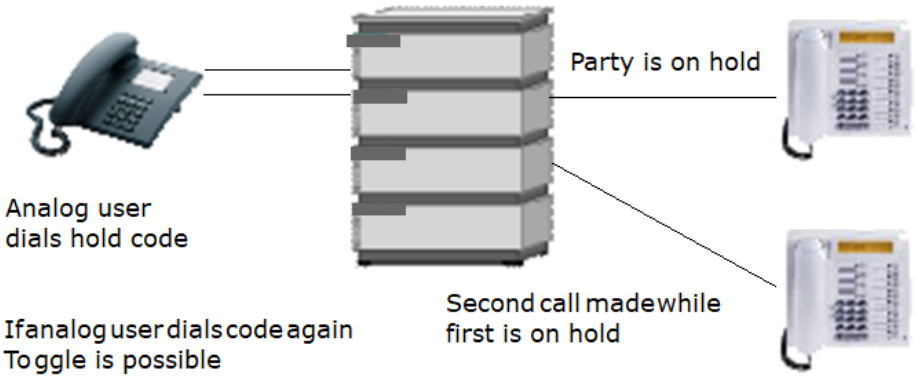
10.7.2.1 Feature Description

With this change request it is now possible to reroute calls after call forward no reply. This means that if after CFNR execution the destination is not reachable then the call is rerouted to the redirection party.

10.8 Call Hold analog

10.8.1 Overview

The Hold function previously available via keyset functions and the Call Park feature is also available for analog telephones.



10.8.2 Feature Description

An Analog station user can place a call on hold and hang up without losing the call. After holding the call, the user may originate or receive other calls on the same line and alternate between the two calls, holding one call while speaking to the other.

The Call Hold analog feature is only possible during a stable two party talk state.

This feature allows only an Anate (including Off Premise Station) to place one of the following connections on hold freeing up the line for other calls :

- Partner device is an Anate.
- Partner device is a Digite (CMI / Keyset / DFT).
- Partner device is a Functional Device.
- Partner device is an analog CO/TIE trunk.
- Partner device is a digital CO/TIE trunk.

If the held party releases, the hold position becomes available for new calls.

Once a party is placed on hold, the call can only be retrieved by the same Anate that placed the call on hold.

Only one party can be held in the call hold location at a time. If a station attempts to put a second call on hold while another is on hold, the second call is placed on hold. The first call is removed from hold and reconnected to the station user activating hold.(in effect the user hastoggled the calls

10.8.3 User Interface

Only one feature access code is provided for Call Hold and retrieval.

Only an Anate can put a call into a hold position via the Call Hold analog access code. The following acknowledgements are given to the Anate for placing a call on hold :

- Confirmation tone, when holding was successful.
- Immediate talk, when an existing call was already on hold.
- Busy tone, when call hold is not allowed for partner device type.
- Reorder tone for all other cases, where holding is not possible.

The held subscriber is given announcement or music or silence, while on hold.

The same Call Hold analog access code will be used to retrieve the call again from the hold position. The following acknowledgements are given to the Anate:

- Immediate talk, for retrieving a Call Held party.
- Reorder tone, when attempting to retrieve a party and the hold location is empty.

A party left on hold (single held) recalls the Anate that placed the call on "Call Hold analog" after the timeout of the Hold Recall timer, or is intercepted to the Attendant/ACWin, dependent upon the system parameter (COT parameter SPAH) and the state (idle, busy or out of service) of the party that held the call.

10.8.4 Service Information

- The Call Hold Analog feature is only a local feature and not available network-wide.
- Only Anates have access to the Call Hold analog feature.

10.8.5 Generation (Example)

Assign Call Hold analog access code :
`ADD-WABE:CD=<XYZ>,DAR=HOLD;`

Change timer value for Call Hold analog recall timer:
`CHA-CTIME:TYPESWU=CP1,CTHLDREC=<X>;`

Caution: This timer is also used for feature "System Manual Hold".

Optionaly, assign COT parameter SPAH to COT <N> of an used digital or analog trunk:

```
CHANGE-COT:COTNO=<N>,COTTYPE=COTADD,
PAR=SPAH;
```

10.8.6 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
WABE	HOLD	d	Gespräche halten/wiederholen auf/von Halte Position
WABE	HOLD	e	call hold and retrieve to/from hold location
CTIME	KDHLDREC	d	Call Hold analog Wiederanrufzeitglied
CTIME	CTHLDREC	e	call hold analog recall timer
COT	SPAH	d	nach Wiederanrufzeitgliedablauf wird ein geparkter oder gehaltener Teilnehmer zum Vermittlungsplatz weitergeleitet
COT	SPAH	e	on recall timer expiry, a parked or held party is routed to the attendant

10.9 Call ID (Name and Number) on Analog Port with PRI NI2 Calls

10.9.1 Feature Description

In OpenScape 4000 the caller ID number is sent via PRI NI2 from Telco central office to an analog port between the first and second ring cycle. The Calling Party Name Facility message is a separate message that is sent after the OpenScape 4000 (PBX or CPE) sends the Alert message to the Telco central office.

OpenScape 4000 only sends caller ID information during the long silent interval between the first and second power ringing patterns.

Telco sends caller party name information typically after silent interval between the first and second power ringing patterns.

Activating this feature the caller ID number and caller party name is sent between first and second power ringing pattern.

10.9.2 Generation (Example)

```
CHANGE-FEASU:TYPE=A,CM=CLIP;

CHANGE-ZAND:TYPE=ALLDATA3,CLIPSTD=ETSIFSK;
```

10.9.3 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
FEASU	CLIP	d	Calling Line Identification Presentation CLIP für analoge Teilnehmer
	CLIP	e	Calling Line Identification Presentation CLIP for analog subscribers
ZAND	CLIPSTD=ETSIFSK	d	CLIP Protokoll Standard für analoge Teilnehmer ETSI mit FSK(Frequency Shift Key)
	CLIPSTD=ETSIFSK	e	CLIP Protocol Standart for analog subscribers ETSI with FSK(Frequency Shift Key)
	EINGVA	d	Im Nachtschaltungsfall zu aktivierende Variante
	OPT	e	NIGHT OPTION ON ACTIVATION OF NIGHT MODE
	NTVAx	d	DER NACHTVARIANTE x ZUGEORDNETE VARIANTE x = 1 ... 8
	NOPTx	e	DEVICE(S) ASSIGNED TO NIGHT OPTION x x = 1 ... 8

10.10 Calling Line Identification (CLI) Enhancements

10.10.1 Feature Description

Requirements from the customers for special handling of incoming calls in OpenScape 4000:

- In the case the incoming number matches a predefined number/pattern, it has to be changed to an internal number - as if the call came from an internal number.
- In the case the incoming number matches a predefined number/pattern, the incoming party name has to be changed - so the calling party can be recognized. **Alpha tagging**: In the case the incoming number matches a predefined number/pattern, the incoming party name has to be changed - so the incoming number can be recognized. **Call barring**: In case the incoming number matches a predefined number/pattern, one of the following has to be done:
  - The call has to be rejected.
  - The call has to be routed to a predefined number (hotline destination).
  - The call has to be accepted (routed to the original called party).
  - The call barring processing described above should also depend on the called destination number (not only on the calling party number).
- No intercept to attendant console if the CLI number is unknown.

10.10.2 Realization

There are two kinds of tables:

- DDI table: table for checking the called (DDI) number (1 table)
- CLI tables: tables for checking the calling (CLI) number (19 tables)

NOTICE: If checking CLI only and not called/DDI as well, then only 1 CLI table can be used (CLI table #1)

For both kind of tables number patterns can be specified:

- the digits 0-9,
- the letter "X" indicating any digit 0-9,
- the letter "Z" indicating any number of any digits 0-9.

IMPORTANT: The maximum number of entries over all of these tables is 64000.

10.10.3 Prerequisites

1) LCR Dialing Plan Configuration

Only for DDI table type of CLIMA records.

In order to add a DDI type of clima record , user must add a dial plan having the following values.

- LCR Dialing Plan Numbers:

  DPLNUM=770 is reserved for DDI table

  DPLNUM=771-789 for CLI tables 1-19
- LCR Pool Number : 8

  LWMPOOL=8
- LCR Dialing Plan :0

  DIALPLAN=0 for DDI

  DIALPLAN=1-19 for CLI. 1 -19

  Create the DDI/CLI tables with AMO CLIMA (770 for the DDI table,771-789 for the CLI tables).

2) To add a clima record having dial plan number "x", user should previously add a dial plan having dial plan number "770 + x" and LCR Pool Number 8 in OpenScape 4000 Assistant "LCR Dialing Plan Administration" dialog.

For example if an user want to create a clima record having dial number 1, 771 dial plan having poll number 8 should be added first.

For all table types(DDI & CLI) is the following

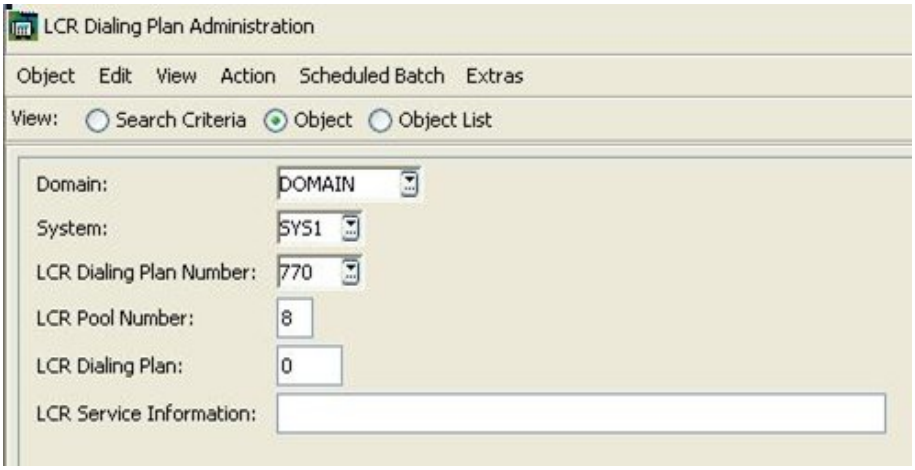


Figure 96: LCR Dialing plan configuration

3) Assign the COT parameters:

- CLNA (for CLI name translation)
- CLNO (for CLI number modification)
- CLAC (for CLI action/ call barring)
- DDIC (for DDI control)
- CLNI (CLI number unknown - no intercept to attendant console)

10.10.4 Service Information

How calls are processed:

1) An incoming call is received with a called number (e.g. WABE access code STN/TLN)

2) If COT parameter **DDIC** is set, the called number is checked against the DDI table (only when the digit analysis result is station or a hunt group). This table will determine which CLI table to use for checking the CLI number.

3) If COT parameter DDIC is not set, or if the DDI table is empty, or if the called number is not found in the DDI table, only the first CLI table will be used. Specifically, this means if you are checking for CLI only and not called party/ DDI, then configuration entered in CLI tables 2-19 will not be checked, only CLI table #1 will be searched.

4) Then the CLI number (from step 1) will be checked against the CLI table.

5) If the calling number is found in the CLI table the following will happen:

- If COT parameter **CLNA** is set, the calling party name will be overwritten by the name from the CLI table.
- If COT parameter **CLNO** is set, the calling party number will be overwritten by the number from the CLI table.
- If COT parameter **CLAC** is set, the CLI action from the CLI table will be executed:
  - For **REJECT** the calling party will be disconnected.
  - For **RESTRICT** the call will be routed to the hotline destination specified in the CLI table.
  - For **ACCEPT** the call will be accepted (to the called destination).

If the CLI number is not found in the CLI table, the following will happen:

- If at least one of the COT parameter **CLNA** or **CLNO** or **CLAC** is set :
  - the call will be accepted (sent to called party) if COT **DDIC** is not set.
  - the call will be intercepted to Attendant if COT **DDIC** is set and COT **CLNI** is not set.
  - the call will be accepted if COT **DDIC** and COT **CLNI** are set and calling number has PresInd Restricted.
- If none of the COT parameters **CLNA** or **CLNO** or **CLAC** is set, then the call will be accepted (sent to called party).

Scenarios

- Incoming call is rejected

  If an incoming call is rejected by this feature the call is cleared with cause "incompatible destination" in order to disable a callback attempt from the calling party.
- Incoming call to a station that is restricted

  For an incoming call to a station that is restricted, the hotline destination is called. If this hotline destination is busy the call is cleared with cause "incompatible destination" in order to disable a callback attempt from the calling party.
- Call back

  There is an incoming call to a station where the calling party name/number is modified according to this feature and the calling party activates a callback.

Then during callback execution the original name/number of the calling party will appear and not the modified name/number.

Restriction

This feature will only work for incoming digital trunks (including IP trunks). The new COT parameters can only be set for digital trunks.

"CLI Call Baring and Alpha Tagging (CLIMA)" in OpenScape 4000 Assistant/Manager

The "CLI Call Baring and Alpha Tagging (CLIMA)" is available in CM Assistant and CM Manager. There is a close relationship between "CLIMA" (**Start Page** > **Configuration Management** > **Tables** > **Dial Plan**) and "LCR Dialing Plan Administration" (**Start Page** > **Configuration Management** > **Least Cost Routing**) dilalogs. To use all functionality in CLIMA dialog, user should first configure LCR Dialing Plans by using "LCR Dialing Plan Administration" .

Rules for CLIMA

To add/modify a clima record you should obey the rules mentioned below. If you do not obey the rules, an error message appears.

1) For all clima table types, the user must specify the switch name, table type dial plan and pattern.
2) If the user tries to add a CLI type of clima record, Action must be specified.
3) If the user specified **restrict** value in action field, "Index of destination table" must be also specified. This value must be between 1 and 2512.
4) During adding/modifying DDI type of clima record, it is not allowed to enter values for "Action", "Index of Destination Table", "Name Representing the CLI Digit Pattern" and "Alternate Number for the CLI Digit Pattern".
5) Pattern should be unique among the all clima records and change operation on pattern field is not allowed like table type.
6) Pattern could be a combination of 0..9xXzZ.
7) Dial plan number must be in the range between 1-19.
8) Dial plan number choice list shows the list of predefined LCR dial plan number – 770 in the range between 770 and 790.

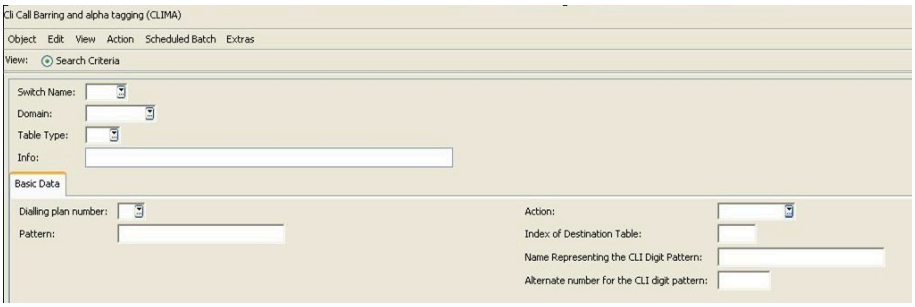


Figure 97: CLI call barring and alpha tagging (CLIMA)

10.10.5 Generation

- Reserve dialplans 770 for DDI table and 771-789 for CLI tables

```
ADD-LDPLN:LCRCONF=LCRADM,DPLNUM=770,LWMPOOL=8,
DIALPLAN=0,INFO="DDI TABLE";
```

```
ADD-LDPLN:LCRCONF=LCRADM,DPLNUM=771,LWMPOOL=8,
DIALPLAN=1,INFO="CLI TABLE1";

ADD-LDPLN:LCRCONF=LCRADM,DPLNUM=772,LWMPOOL=8,
DIALPLAN=2,INFO="CLI TABLE2";
```

- Reserve special LCR dialingplan entries
  ```
  ADD-DIMSU:LDPLN8=1000;
  ```
- Create DDI table entries

  ```
  ADD-CLIMA:TABLE=DDI,DDIDP="12001",PLAN=1;

  ADD-CLIMA:TABLE=DDI,DDIDP="12002",PLAN=2;

  ADD-CLIMA:TABLE=DDI,DDIDP="12003",PLAN=2;
  ```
- Create CLI table entries

  ```
  ADD-CLIMA:TABLE=CLI,PLAN=1,CLIDP="4930640014001",
  NAME="ANL91-1",NUMBER=28814001,ACTION=ACCEPT;

  ADD-CLIMA:TABLE=CLI,PLAN=2,CLIDP="4930640014002",
  NAME="ANL91-2",NUMBER=8814002,DESTIDX=1,ACTION=RESTRICT;

  ADD-CLIMA:TABLE=CLI,PLAN=1,CLIDP="4930640014000",
  NAME="ANL91-3",NUMBER=8814000,ACTION=ACCEPT;

  ADD-CLIMA:TABLE=CLI,PLAN=2,CLIDP="4930640014003",
  NAME="ANL91-4",NUMBER=8814003,ACTION=REJECT;

  ADD-
  CLIMA:TABLE=CLI,PLAN=1,CLIDP="49307100X",NAME="ANLX46
  ACCEPT",ACTION=ACCEPT;
  ```
- Assign e.g. several COTs for incoming CO trunk
  ```
  CHANGE-
  COT:COTNO=60,COTTYPE=COTADD,PAR=CLNA&CLNO&CLAC&
  DDIC&CLNI;
  ```

10.10.6 Relevant AMOs

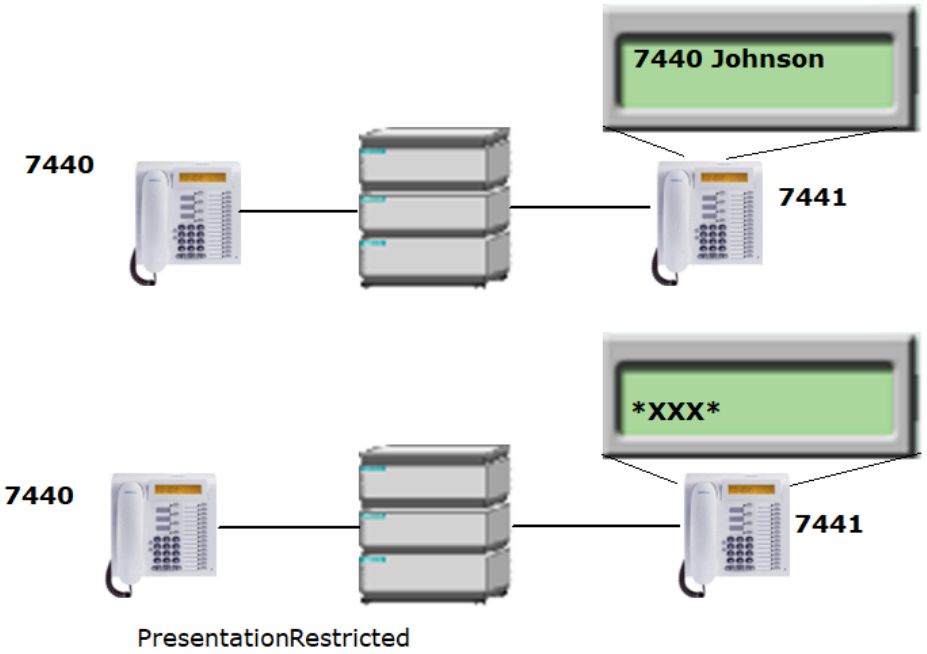
AMO	Parameter	Sprache/ Language	Beschreibung/Description
CLIMA	AKTION	d	ACCEPT: Der Anruf wird akzeptiert. REJECT: Der Anruf wird abgelehnt. RESTRICT: Der Anruf wird an eine vordefinierte Rufnummer, basierend auf dem **DESTIDX** Feld weitergeleitet.

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	ACTION	e	ACCEPT: The call will be accepted. REJECT: The call will be refused. RESTRICT: The call will be routed to a predefined extension based on the Destination Index field.
	CLIDP	d	Falls die Nummer des kommenden Anrufers zu dieser/diesem Nummer/ Muster passt, wird die entsprechende Aktion ausgeführt.CLIDP kann aus den Ziffern 0-9 und den Buchstaben X und Z bestehen.
	CLIDP	e	In case the incoming number matches this number/pattern, the corresponding action will be taken. CLIDP can contain digits 0-9 and literals X and Z.
	DDIWM	d	die gerufene Nummer wird gegen diese Nummer/dieses Muster geprüft. DDIWM erlaubt die Ziffern 0-9 und die Zeichen X und Z.
	DDIDP	e	The called number is checked against this number/pattern. DDIDP can contain digits 0-9 and literals X and Z.
	DESTIDX	d	Wenn **AKTION=RESTRICT** ist und die externe Nummer passt, wird der **DESTIDX** in der (mit HOTLN: HOTDEST konfigurierten) Zieltabelle gesucht und der Anruf wird an den entsprechende Rufnummer weitergeleitet.
	DESTIDX	e	If **ACTION** is **RESTRICT** and the external number matches, the destination number will be changed to the value looked up in the Destination Table (configured with HOTLN:HOTDEST) based on this index value.
	NAME	d	Wenn die externe Nummer passt, wird der Name der externen Party in diesen Wert geändert.
	NAME	e	If the external number matches, the name of the external party will be changed to this value.

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	NUMMER	d	Wenn die externe Nummer passt, wird die Nummer der externen Party in diesen Wert geändert.
	NUMBER	e	If the external number matches, the number of the external party will be changed to this value.
	PLAN	d	Dieser Parameter bestimmt, welche CLI-Tabelle verwendet wird, um CLIDP zu prüfen.
	PLAN	e	This parameter determines which CLI Table to use for checking the CLIDP.
COT	COTPAR=CLNA	d	CLI Name / Namensaustausch
	PAR=CLNA	e	CLI name / alpha tagging
	COTPAR=CLNO	d	CLI Nummernmodifikation
	PAR=CLNO	e	CLI number modification
	COTPAR=CLAC	d	CLI Aktion / Anruf zurückweisen
	PAR=CLAC	e	CLI action / call barring
	COTPAR=DDIC	d	DDI-Kontrolle
	PAR=DDIC	e	DDI control
	COTPAR=CLNI	d	Kein Abwurf zum AC für unbekannte CLI
	PAR=CLNI	e	CLI number unknown - no intercept to AC
DIMSU	LWM8	d	Anzahl der Einträge im Wählmusterplan 8 für Least Cost Routing
	LDPLN8	e	number of dial plan entries for lcr in dial plan 8
LDPLN	WAPLNUM	d	LCR Wählplannummer
	DPLNUM	e	LCR dial plan number
	LWMPOOL	d	LCR Poolnummer
	LWMPOOL	e	LCR pool number
	WAEHLPLN	d	LCR Wählplan
	DIALPLAN	e	LCR dial plan

10.11 Calling Line Identification (CLI) Restriction

10.11.1 Feature Description



The calling party's name and station number are displayed at the called party's station or attendant console either directly or indirectly in the following cases:

- Internal / external call (external in the case of ISDN),
- Switching traffic,
- Callback (particularly callback-on-no-answer in mailbox),
- Call pickup (call waiting, call pickup group), CF / CFNA, server traffic and connection to paging equipment.
- Attendant console - hold menu

IMPORTANT: The calling and called parties in the description below can be extensions or attendant consoles.

It is possible to suppress the display of the calling party's name and station number at the called party's station for individual calls and for specific systems, circuits, and users.

With display suppression you must decide whether the line is a "normal line" or a "confidential line".

"Normal line":	The station number is passed on and displayed at the called party's station or attendant console.

"Confidential line":	Station Number display at the called party's station is always suppressed. In this case, the text string to appear on the display of the called party's station can be established using a central parameter (applies to all called parties in the system).

You can administer the confidential line for users.

	Configuration Management --> Line --> Station, enter station number and Search. Select the required value in the Basic 1 tab under Display and save. Display=NO/YES/External Alternative Number/not extern
	With the AMO SBCSU, AMO SCSU, AMO SSCSU, or AMO-SDAT via the parameter `SSTNO=YES/NO/ONLYEXT/ONLYEX0;` **YES**= This user's station number (name) is not displayed at the called party's station (internally and externally); **NO** = This user's station number is displayed at the called party's station internally and externally); **ONLYEXT** = Only a replacement number (as configured with AMO KNMAT) is displayed at an external station instead of this user's station number; **ONLYEX0** = Neither this user's station number nor a replacement number is displayed at an external station.

10.11.2 Service Information

- To ensure that the external calling line identification restriction and the external display of a replacement number (ONLYEX0 and ONLYEXT) function correctly, you must make an entry to modify the station number with a special modification condition.
- The protocol must be able to transmit this information to the destination (e.g. QSIG).
- To suppress the display, the carrier must support a case-by-case suppression to allow the function.

IMPORTANT: You can administer the confidential line for the attendant console's number (ATNDIND) only in the AMO ACSU with the parameter STATNDNO=YES/NO/ONLYEXT. (However only in expert mode in the management interface).

10.11.3 Generation (Example)

Configure the calling party as "secret" and configure a text string, such as "SUBSCRIBER UNKNOWN" for display at the called party's station.

- Set up confidential line at calling party (7140) for outgoing calls:

	Configuration Management --> Line --> Station, enter station number and Search. Select NO in the Basic 1 tab under Display and save. (Display No means this is a confidential subscriber)
	Use the AMO SDAT to set confidential subscriber: `CHANGE-SDAT:STNO=7140,TYPE=DATA,SSTNO=YES;`

- Set up confidential line at attendant console for outgoing calls:

	You must be in expert mode to administer the confidential line for attendant consoles. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	Use the AMO ACSU to set confidential subscriber: `CHANGE-ACSU:ATNDNO=7777,SATNDNO=YES;`

- Configure display text *XXX* at called party for confidential line calls:

	You must be in expert mode to administer the display text. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	Set the display text XXX with the AMO ZAND as follows: `CHANGE-ZAND:TYPE=ALLDATA2,DISPNUUN=*XXX*;`

10.11.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
SDAT	GETLNNU	d	geheime Teilnehmer-Rufnummer
	SSTNO	e	Secret station number
ZAND	ANZNUUN	d	Anzeigetext im Display von Teilnehmer B
	DISPNUUN	e	Text on display of extension B
SBCSU	GETLNNU	d	geheime Teilnehmer-Rufnummer
	SSTNO	e	Secret station number
SCSU	GETLNNU	d	geheime Teilnehmer-Rufnummer
	SSTNO	e	Secret station number
SSCSU	GETLNNU	d	geheime Teilnehmer-Rufnummer
	SSTNO	e	Secret station number

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
ACSU	GEVFNU	d	geheime Vermittlungsplatz-Rufnummer
	SATNDNO	e	Secret ac number

10.11.5 Further Features in Connection with CLIR

10.11.5.1 Display Control for a Single Call

10.11.5.1.1 Feature Description

Suppression of the display of names and numbers on the called party's station is controlled by the selection of access codes (in the case of an Optiset with a display this can also be controlled using the menu item "Display Suppression" in the service menu "Additional Functions"). The access codes function differently depending on whether the line is normal or confidential.

Display suppression for a "normal line":

In the case of a "normal line", the code for display suppression on (DISUON) causes the display to be suppressed at the called party's station for the next call only.

Station Number display in the case of a "confidential line":

In the case of a "confidential line" the code for display suppression off (DISUOFF) causes the station number to be passed on for display at the called party's station for the next call.

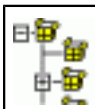
10.11.5.1.2 Service Information

- The display suppression access codes can be assigned to the name keys, together with the destination station numbers of the parties for whom the modified display functions are to apply.

10.11.5.1.3 Generation (Example)

- Set up access codes as follows: (**80 Display Suppression ON and ##80 Display Suppression OFF)

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code, select it as dial code type DISUON, and save.
	To configure a code for DISUON with the AMO WABE: `ADD-WABE:CD=**80,DAR=DISUON;`

	Configuration Management --> Tables --> Dialing Plan --> Dial Codes, click New. Enter dial code, select it as dial code type DISUOFF, and save.

To configure a code for DISUOFF with the AMO WABE:
`ADD-WABE:CD=##80,DAR=DISUOFF;`

10.11.5.1.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
WABE	RNR	d	Rufnummer
	CD	e	Access code
	KZP	d	ANZUEIN Anzeigenunterdrückung einschalten ANZUAUS Anzeigenunterdrückung ausschalten
	DAR	e	Digit analysis result DISUON Display Suppression ON DISUOFF Display Suppression OFF

10.11.5.2 Display Control for a Replacement Number for Calls to an External Station

10.11.5.2.1 Feature Description

For confidential lines with SSTNO=ONLYEXT a replacement number can be configured for display at the called party's station. The modification in the AMO KNMAT must be entered in the relevant NPI for the calling station number. The customer station number must be specified under NUMEXT without any prefixes according to the TONE - as administered in the AMO KNFOR or in the case of no entries TONE=INTERNATIONAL - up to the destination node. The * is used in this case as a delimiter between the customer station number and the extension to be replaced (or the number sequence). The extension number in the "calling party" will be substituted for outgoing calls by the replacement number (number sequence after delimiter *) if in addition REPEXT is defined under MODCON.

10.11.5.2.2 Service Information

IMPORTANT: The display of the ACD group number instead of the agent station number can be administered in the TYPE=ACD branch of AMO ZAND with the parameter SUPAGTNU=YES/NOr. (However only in expert mode in the management interface)

IMPORTANT: There must be an entry for "replace extension number" when you set display suppression at external stations. In this case no replacement number is sent and the setup is identified as PRESENTATION RESTRICTED.

- The replacement number should be a meaningful number taken from the customer's number block (i.e. Callbacks to this number should also be able to reach an STN/ATND.)
- Depending upon the numbering plan, digit modification can also be set up for logical nodes (see description of AMO KNMAT).
- Possible alternative paths to other destination nodes have to be taken into account if the replacement number is to be displayed in all cases (see LCR).
- Digit modification is based on the virtual origin and destination node numbers, i.e. not on each individual station!
- Display suppression at external stations (SSTNO=ONLYEXT0) is effective only with a valid replacement number.

10.11.5.2.3 Generation (Example)

Display of a replacement number 0 for the calling party (node 1-89-100) to the CO with destination node number 1-89-190 for ISDN numbering plan (here: international format as administered). The extension number - here 7141 - in the "calling party" will be substituted by the replacement number (here: 0 for e.g. the DAR ATND).

- Set up confidential line to an external station for calling station with replacement number:

	Configuration Management --> Line --> Station, enter station number and Search. Select External Alternative Number in the Basic 1 tab under Display and save.
	Use AMO SDAT to set confidential subscriber: `CHANGE-SDAT:STNO=7141,TYPE=DATA,SSTNO=ONLYEXT;`

- Display node format table:

	Configuration Management --> Tables --> Dialing Plan --> Node Format Tables (KNFOR), click SEARCH. Browse to the required destination node number and read off the format data.
	Use the AMO KNFOR to display data: `DISPLAY-KNFOR:DNNO=<destination node number>;` (Destination node number format data)

- Example for digit modification. The level where modification takes place depends on the virtual destination node number. The format of the number determines the entry in the node format table. If there is no entry there, ISDN always uses the international format.

	Configuration Management --> Tables --> Dialing Plan --> Network Node Data (KNMAT), click NEW. Select the modification condition in the Node Number Modification tab, enter the data, and save.
	Use the AMO KNMAT for set digit modification: `CHANGE-KNMAT:NPI=ISDN,LEVEL=0,ONNO=100,DNNO=190,MODCON=OUT&REPEXT,NUMEXT=498978062*0;`

10.11.5.2.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
SDAT	GETLNNU	d	geheime Teilnehmer-Rufnummer
	SSTNO	e	Secret station number
KNMAT	NPI	d	Numbering plan identifier, Rufnummernplan
	MODBED	d	ERSNST=Ersetzten Nebenstellennummer
	MODCON	e	REPEXT= Replace station number
ZAND	UNAGTNU	d	Anzeige Rufnummer der ACD-Gruppe
	SUPAGTNU	e	Display the number of the ACD group

10.11.5.3 Display Control (using parameters DISPTGNA/INDNADIS)

10.11.5.3.1 Feature Description

From EV 3.0, QSIG-compliant behavior was implemented for independent display of numbers and names, i.e. now number and name can be independently checked for "presentation allowed". In the PABX, the number and the respective name of a confidential line (SSTNO=YES) are always designated as "presentation restricted". For this reason, so far only the number was checked for "presentation allowed". If the presentation of the number was permitted, the name was also displayed and vice versa. If a station number is not transmitted, either the defined string or the trunk group name is displayed depending on the AMO ZAND setting.

1) If the calling party and the called party are in the same system, the string that has been set with the parameter DISPNUUN=< string > is displayed regardless of how the parameter DISPTGNA was set with the AMO ZAND.

2) If the calling party and the called party are in different systems, a distinction must be made between an OpenScape4000/HiPath 4000 to OpenScape4000/HiPath 4000 or a an OpenScape4000/HiPath 4000 to Non OpenScape4000/HiPath 4000 connection.

The parameter DISPTGNA activates the display of the trunk group name in the event of incoming seizures if no name (e.g. no PERSI name in the case of a network-wide call) is provided in the protocol.

- OpenScape4000/HiPath 4000 to OpenScape4000/HiPath 4000 connection:

  Case a: Parameter in the AMO ZAND: DISPTGNA= YES

  A check is made in the protocol for existing names. If the name field is blank (Length=0) and the display allowed ("presentation allowed"), the trunk group name is entered with "presentation allowed" (presentation permission), regardless of the parameter INDNADIS, and can no longer be subsequently overwritten in the network/system. If a name is provided,

but is labelled as "presentation restricted", the name is not overwritten and remains declared as "presentation restricted".

Case b:Parameter in the AMO ZAND: DISPTGNA=NO

No check is made in the protocol for existing names. The string defined with the parameter DISPNUUN appears on the display of the called party's station.

- Connection with a third-party system (e.g. QSIG Protocol):

  The parameter INDNADIS in the AMO ZAND serves to specify the check mechanisms regarding the presentation permission ("presentation allowed or restricted") More recent protocols recognize several variations of "confidential line": Via the parameter INDNADIS in the AMO ZAND, the name can be displayed on the display of the called party, regardless of caller ID suppression.

  Case a: Parameter in the AMO ZAND: INDNADIS=YES

  Numbers and names are checked for "presentation restricted" separately and can thus be displayed independently of one another.

  Furthermore, this setting also contains a check that compares the called numbers and returned numbers with one another: If the numbers are the same, the target number is also displayed, even if the display is not permitted (confidential).

  Case b: Parameter in AMO ZAND: INDNADIS=NEIN

  Only the calling number is checked for "presentation restricted" and the behavior for the name adopted, i.e. either the calling number and name are displayed in the case of "presentation allowed", or both are suppressed in the case of "presentation restricted". In this case, the string that is entered with the parameter DISPNUUN and/or the outgoing trunk group name in the case of DISPTGNA = YES for the called party can be displayed.

10.11.5.3.2 Service Information

- In the case of outgoing traffic, the route name is generally completed and/ or presented on the display, unless a name with "presentation allowed" is returned from the destination. If no name is administrated in the AMO RICHT, the trunk group name of the outgoing trunk group used is displayed if DISPTGNA is set.
- The first system with DISPTGNA set completes the trunk group name and this trunk group name may then be displayed if DISPTGNA= YES. Other systems on the network which are transited no longer overwrite the trunk group name.
- The parameters INDNADIS and DISPTGNA should be set identically in all systems of a network group.
- The parameters INDNADIS and DISPTGNA should generally be set to "YES"

NOTICE: Caller ID suppression can be achieved for all external EDSS1 connections per trunk - regardless of the

subscriber configuration - with the COT parameter LPRN (see description of COT parameter).

NOTICE: The attribute LATTR=SUPPCPN (AMO LDAT) may not be used in connection with confidential numbers and/or the suppression of the calling party number, as suppression only takes place in the case of Transit Interworking (switching of the numbering plan)!

10.11.5.3.3 Generation (example)

- Configuring system-wide display of the trunk group name:

	You must be in expert mode to administer the display of the trunk group name. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	Use the AMO ZAND to set the display of the trunk group name: `CHANGE-ZAND:TYPE=ALLDATA2,DISPTGNA=YES;`

10.11.5.3.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
ZAND	DISPTGNA	d	Bündelname im Display von Teilnehmer B anzeigen
	DISPTGNA	e	Display name of trunk group of extension
	INDNADIS	d	Steuerung der Namensanzeige am Display des B-TLN
	INDNADIS	e	Control of display name at the display of extension B
LDAT	LATTR	d	KANZATLN
	LATTR	e	LCR Attribute

10.11.5.4 Exceptions to Honoring Presentation Restriction Indication

10.11.5.4.1 Feature Description

1) Parameter CIDBON (AMO ZAND)

If CIDBON=NO all attendant consoles on this system will only honor restricted presentation indication for off-net calls. On-net calling parties that are marked "presentation restricted" (display suppression is invoked) will have their name and number displayed on the attendant console, if provided for in the protocol.

2) Parameter in AMO-SBCSU TRACE=Y (e.g.: AMO SBCSU for called party); the display of the number and the name of the calling party - regardless of whether this involves a confidential subscriber or not - is generally permitted

in the case of incoming calls (the calling party set "presentation allowed" at the called party for the "calling party".).

10.11.5.4.2 Service Information

IMPORTANT: Setting the TRACE parameter to "Y" may violate privacy regulations in some countries (e.g. United States).

- The parameter CIDBON refers to all VPLs of a physical node.

10.11.5.4.3 Generation (Example)

- 1. Configuring the function for attendant consoles:

	You must be in expert mode to administer the function for attendant consoles. Expert mode --> ComWin --> Open ...< IP> using AMO (see AMO command).
	Configure with AMO ZAND as follows: `CHANGE-ZAND:TYPE=ALLDATA3,CIDBON=NO;`

- 2. Configuring the function for STN 7141:

	Configuration Management --> Lines --> Station, enter station number and Search. Select "Malicious call tracing" in the Basic 3 tab and save.
	Set function using AMO SDAT as follows: `CHANGE-SDAT:STNO=7144,TYPE=DATA,TRACE=YES;`

10.11.5.4.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
SBCSU	AMTFANG	d	Fangen eines Amtsgespräches erlaubt
	TRACE	e	Malicious call trace allowed
ZAND	ANHRIDNR	d	Auswertung der Anzeigeunterdrückung
	CIDBON	e	Caller ID blocking for on net calls

10.11.5.5 Display Suppression for Analog and T1 Trunks (only US)

10.11.5.5.1 Feature Description

Analog and T1 trunks are incapable of delivering caller ID information to the public network. However the serving Central Office (CO) has the capability to generate a calling party number that has been assigned to the trunk group on which the call originates. The calling party number generated by the public network is known as Automatic Number Identification (ANI).

In order to block or unblock the generation of an ANI number by the CO, the Caller ID Block/Unblock feature can optionally send - based on a new trunk

attribute and based on the existing trunk dialing method - the standard caller ID blocking or unblocking access codes as a prefix to the destination address digits.

10.11.5.5.2 Service Information

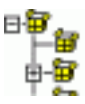
The COP parameter NAAT must be set in the case of outgoing analog circuits, so that the CO prefixes can be sent as they are configured in the following example.

10.11.5.5.3 Generation (Examples for US)

The standard dial codes as understood by CO in US (according to North American Number Plan) are:

For caller ID blocking:	*67 (Usage with DTMF trunks)
	1167 (Usage with DP trunks)
For caller ID unblocking:	*82 (Usage with DTMF trunks)
	1182 (Usage with DP trunks)

- Supplement COP with NAAT (for analog circuits):

	Configuration Management --> System Data --> Trunk --> Class of Parameter, enter COP number and Search. Select NAAT in the parameter tab and save.

	Set parameter NAAT using AMO COP as follows: `CHANGE-COP:COPNO=<copnumber>,PAR=NAAT;`

- Change circuit at 1-1-55-0, so that none of the above-mentioned standard access codes are sent:

	Configuration Management --> System Data --> Trunk --> Trunk, enter PEN and Search. Select the value NONE in the Analog Extensions tab in the Caller ID Blocking/Unblocking Digits selection window and save.
	Set parameter CIDDGTS using AMO TACSU as follows: `CHANGE-TACSU:PEN=1-1-55-0,CIDDGTS=NONE;`

- Change circuit at 1-1-55-0, so that a called party number is prefixed by this standard code for display suppression off in the case of non-confidential subscribers:

	Configuration Management --> System Data --> Trunk --> Trunk, enter PEN and Search. Select the value SEND82 in the Analog Extensions tab in the Caller ID Blocking/Unblocking Digits selection window and save.
	Set parameter CIDDGTS using AMO TACSU as follows: `CHANGE-TACSU:PEN=1-1-55-0,CIDDGTS=SEND82;`

- Change circuit at 1-1-55-0, so that a called party number is prefixed by this standard access code for display suppression on in the case of confidential subscribers:

	Configuration Management --> System Data --> Trunk --> Trunk, enter PEN and Search. Select the value SEND67 in the Analog Extensions tab in the Caller ID Blocking/Unblocking Digits selection window and save.
	Set parameter CIDDGTS using AMO TACSU as follows: `CHANGE-TACSU:PEN=1-1-55-0,CIDDGTS=SEND67;`

- Change circuit at 1-1-55-0, so that the above-mentioned standard access codes are sent, depending on request:

	Configuration Management --> System Data --> Trunk --> Trunk, enter PEN and save. Select the value BOTH in the Analog Extension tab in the Caller ID Blocking/Unblocking Digits selection window and save.
	Set parameter CIDDGTS using AMO TACSU as follows: `CHANGE-TACSU:PEN=1-1-55-0,CIDDGTS=BOTH;`

10.11.5.5.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
TACSU	CIDDGTS	d	Unterdrückung der Anruferidentification
	CIDDGTS	e	Caller ID blocking / unblocking
COP	COPPAR	d	NAAT =Nordamerikanische analoge Übertragung
	COPPAR	e	NAAT = North american analog trunk

10.11.6 CLIR on an Individual Subscriber Basis

When the subscriber specific SDAT attribute **SECRAGNT** is set, for calls initiated by this device the following scenarios apply:

- In case of local calls the calling party number is treated as hidden / secret
- In case of external calls, the calling party number is treated as hidden / secret, unless PUBNUM is set for the calling party and the outgoing trunk, in which case the PUBNUM is transported as calling party number.
- If the device is marked as **SECRET** or has dialed "secret call access code", its number will not be transported at all.
- The parameter can also be used to suppress the display of calling party number in Call Center.

10.12 Calling Line Identification (CLI) Translation

10.12.1 Feature description

Certain features (e.g. call diversion and callback) do not work in mixed OpenScape 4000/DX-networks because of existing problems with the backwards translation of numbers (e.g. redirection party numbers) from DX-> OpenScape 4000.

The problem can be made worse by numbering schemes that are adopted. For example where 2 companies merge.

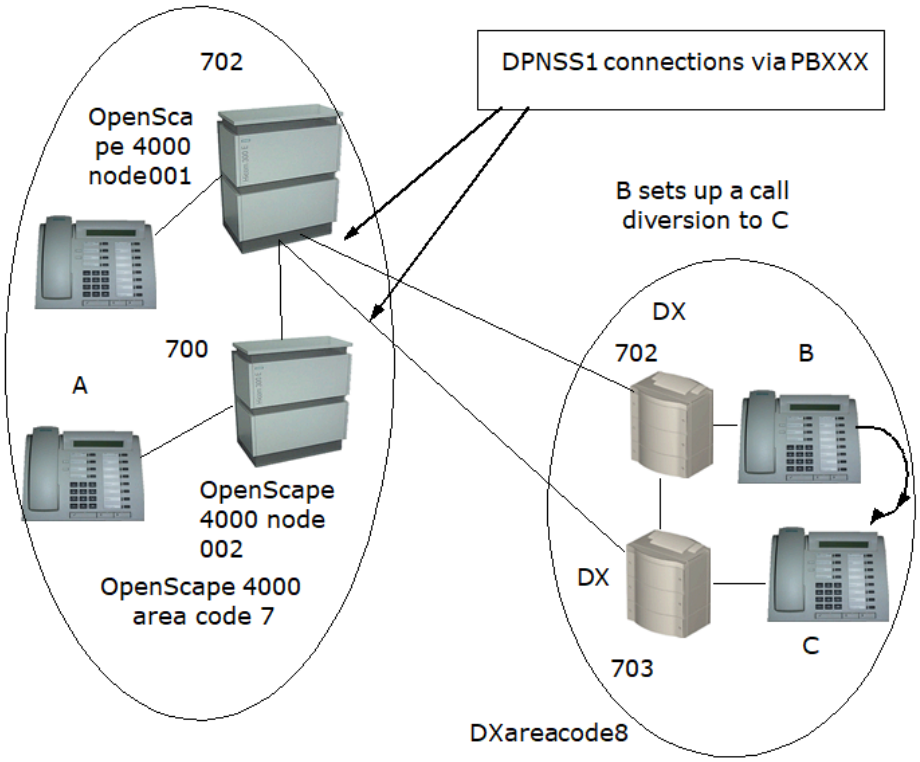


Figure 98: Mixed OpenScape 4000 - DX network

Figure 102 shows an example of a network where all the node ID's (i.e. routing codes) are of equal length. The DX network is represented as fictive OpenScape 4000 node 3 (for CLI purposes).

The customer requirement is that they can successfully CF to any extension anywhere in the network. In addition callback to diverted to extensions will also be successfully supported.

The problem with this arrangement, is that the Redirection number is returned to node 1 as 703 #C, i.e. the DX network area code is missing. The OpenScape 4000 does not have the correct routing information if it needs to re-establish the call. In this instance even if the diversion had been performed by the DX, OpenScape 4000 would have incorrect routing information if it needed to perform a callback or circuit optimisation.

10.12.2 Generation (Example)

Solution as in the scenario depicted by Figure 102:

User A calls user B by dialling 8 702 #B.

KNMAT (which is active for all call set-ups) adds the routing digits of the calling node (i.e. 700 for level 0 and 7 for level1) and 7700 #A is sent to node 702 and is displayed at B.

Node 702 returns the digits 702 #B to node 1, where DGTPR in TDCSU adds 8 (i.e. the DX network area code) to the front of the string. This is displayed at user A. This is required because the DX does not send a node code OpenScape 4000 can use and so KNMAT cannot prefix the incoming CLI.

If user B has CF to user C, then the diversion may take place, if it is performed by the DX. However, the divert destination that is returned to node 1 is 703 #C.

Even if the diversion has successfully taken place, a problem arises in this situation if the OpenScape 4000 attempts a callback or circuit optimization as it does not have the correct routing information of the diverted to party and therefore callback requests and optimization will fail.

Fig. 1 Example: The calling party dials 8-702-4711. Ext.4711 is forwarded to 8-703-4712

The ISDX 702 send's the redirection party number as 7034712, without the private network ac-cess code. OpenScape 4000 701 can not evaluate the digits correctly and the call attempt fails,or even worse end's at a wrong destination.

Since the ISDX software can not be changed the OpenScape 4000 has to prefix the redirection party num-ber with the private access code before presenting it to digit analysis.

The private network access code is customer specific. In order to allow for enough flexibilty it was decided to administer the access code on a B-channel group basis.

Only ISDN trunks are affected by the feature.

10.13 Call Log for OptiPoint, OpenStage and CP phones

IMPORTANT: Call Log functionality for all SIP phones and HFA/TDM Opentage60 & 80, DPIP55, CP4xx, CP600, CP7xx phones is integrated into the conversation list for these phones. Their internal call log is always available and doesn't have to be configured!

This chapter describes call log functionality offered by OpenScape 4000 system for non-SIP low-end phones: optiPoint 410/420, OpenStage 10/15/20/30/40, DPIP35 and CP1xx, CP2xx.

OpenScape 4000 system offers call log for SIP devices too, including for SIP devices which are out of service, but OS4K call log is never synchronized with phone’s internal call log. In this case, OS4K system call log is used for SIP clients which use CSTA call log interface.

10.13.1 Feature Description

The last incoming and outgoing calls are logged for terminals with display. The user can query the stored information and use the entries to establish outgoing connections.

The Call Log Database is sized to support maximum 30 call log entries per subscriber. However, with the release of OpenScape V11R1, this capacity has been significantly increased, supporting up to 70 call log entries per subscriber.

In the part of the call log reserved for outgoing calls, the last 10 called users are entered (increased to 20 from OpenScape V11R1); in the part for incoming

calls, the last 20 calling (increased to 50 from OpenScape V11R1) users are stored.

The entries are sorted starting from the newest and ending with the oldest entry.

The following data is stored for every entry:

- station number max. 22 digits
- station number in E164 number format max. 22 digits (used for CSTA call log from OpenScape 4000 V11R1).
- name (if available) max. 30 characters
- date / time
- Info: free / busy / call state
- call duration (used by CSTA call log from OS4K V11R1).

10.13.2 Feature Characteristics

- The feature can only be used with optiPoint 410/420 and OpenStage 10/15/20/30/40, DPIP35 and CP1xx, CP2xx terminals.
- There are two different ways to log incoming calls, depending on the station:
  - Logging of all incoming calls regardless of whether a connection was established or not. => ALL
  - Logging of the unsuccessful connection attempts. => TRIES
- Calls are also logged during a temporary failure of the terminal as unsuccessful call attempts.
- The dialed destination number is logged, even if a different destination was reached due to call forwarding.
- Outgoing calls established by using number redial, direct call or repertory key are not stored in the outgoing calls log.
- If a call is signalled on several stations, e.g. group call, RNA, HG, the call is logged in the call log of all called stations.
- CHESE
  - A call is only logged in a CHESE caller list if it not answered by a member of the CHESE, in other words calls for the executive, which are picked up by the secretary, are not logged in the executive's caller list. And vice versa.
  - If one CHESE member deletes an entry in the caller list (by calling the original party back or manually deleting this entry), the entry is also deleted for the other CHESE member.
  - 2 or more executives are assigned to one secretary: When one caller calls all executives one after the other, every executive gets an entry in its call-log of not-answered calls. The secretary gets all calls but only the last call is stored in its call-log (update of time of call of the older entry in case of calls from the same caller). After answering/deleting the last call, the call-logs of the other executives is not updated.
- A key can be assigned to query the call log. The LED is on when there are new incoming calls.
- A "delete entire log" function (separate menu option) can be set up.
- A function can be set up so that the called party instead of the transferring party is stored in the call log (originating number).
- If Autoset Relocate is set, the call log is also moved.
- The call log can only be read on the home station.

- The call log cannot be modified or stored using administration and maintenance.
- The call log is protected against unauthorized readout by the Chapter 107, "Data Security at the Terminal" feature.
- The call log contents are retained after hard and soft restarts.
- Call log has only been implemented for voice services.

10.13.3 Service Information

- For each terminal with display, space in memory must be generated in DIMSU. For each memory space, approximately 1.1 KB is reserved.
- For each optiPoint 410/420 with 4-line display, memory for CALLOGS must be allocated in DIMSU.
- This feature is marketed with every station and needs no special release by code word.
- If stations with COM-manager or for e.g. with their own integrated call logs are used, the internal OpenScape 4000 call log should not be configured.
- This feature is not available for Cordless Multicell Integration and Hicom Trading E.
- Die data are not stored on the hard disk (not RELOAD-proof).

10.13.4 Generation

10.13.4.1 Call log configuration

1) Release the call log feature in the system:
`CHA-FEASU:A,CALOGOPT;`

2) Define the number of users with call log authorization in the system:
`ADD-DIMSU:TYPE=CC2,CALLOG=n;`

3) Specify the number of stations with call log and 4-line display.
`ADD-DIMSU:TYPE=USER,CALLOGS=n;`

4) Assign the feature to a station:

a) Logging of unsuccessful connection attempts
`CHA-SBCSU:STNO=nr,CALLOG=TRIES;`

b) Logging of all incoming calls
`CHA-SBCSU:STNO=nr,CALLOG=ALL;`

10.13.4.2 Set up menu option: delete call log

AMO ZAND Action OPTISET Parameter CALLOG = Yes;

10.13.4.3 Setup: save originating number on transfer

```
AMO ZANDE: TYPE=ALLDATA, SCALLOG = YES;
```

10.13.4.4 Protection of the individual call log

If the COS changeover is set to COSACT=1, browsing in the call log is always allowed.

The call log is only protected if the COS is set to COSACT=2.

Note: See also Chapter 107, "Data Security at the Terminal"

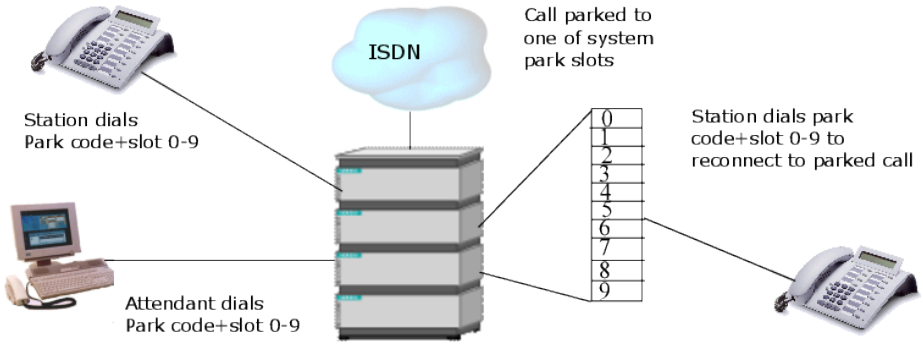
10.13.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
DIMSU	CALLOG	d	Anzahl der optiPoint Endgeraete mit Anrufliste (Zweig User)
	CALLOG	e	Number of optiPoint devices with call log
	CALLOGS	d	Anzahl der optipoint-Endgeraete mit Scrolling Mode für Anruferliste
	CALLOGS	e	Number of optipoint devices with scrolling mode for call log
FEASU	ANRLSOPT	d	Anrufliste für optiPoint
	CALOGOPT	e	Call log for optiPoint
SBCSU	RJOURNAL	d	Endgeraet mit Rufjournal: VERSUCH: Nur erfolglose, ankommende Verbindungen ALLE: Alle ankommenden Verbindungen
	CALLOG	e	Device with callog: TRIES: only incoming calls that haven't been successful ALL: all incoming calls

10.14 Call Parking

In previous versions the feature call park was linked to the feature call pickup, when a pickup group was created the members can park a call within their own pick up group. The system park feature is available with the directed call park feature in addition to the original park function.

10.14.1 System Park



10.14.1.1 Feature Description

The System Park feature allows a station user or an attendant to place a trunk or station connection into a system park slot. Once parked, the call can be retrieved by the same station/attendant or another station/attendant.

The System Park feature is possible only during a stable two-party talk state.

The following devices have access to the System Park feature:

- Analog telephone
- Digital telephone (Keyset or DFT including CMI)
- Attendant
- ACWin (2Q or MQ)

The following devices can be parked:

- Analog telephone
- Digital telephone (Keyset or DFT including CMI)
- Functional devices
- CO trunk (analog and digital)
- TIE trunk (analog and digital

10.14.1.2 User Interface

There are different variants to park or retrieve a call:

- One access code (park code + park slot number (0-9)) is provided for park and retrieval to/from each system park slot.
  - The subscriber dials the park code followed by the system park slot number (0-9).
  - If the call has been parked successfully,
    - the parking subscriber receives confirmation tone,
    - the used system park slot number is displayed, if the parking subscriber has a display option.
  - If the requested system park slot is currently in use,
    - the parking subscriber receives dial tone again,
    - the parking subscriber dials the park code followed by another system park slot number (0-9) without going on-hook.
  - If the call cannot be parked (e.g. all system park slots are in use), the parking subscriber receives reorder tone.
  - This variant can be used by analog telephones, Keyset and DFT with/ without display option.
- Optional for Keyset and DFT with display:
  - To park a call to system, the subscriber uses a System Park key and the next available system park slot is selected automatically by the system and displayed.
  - If the call has been parked successfully, the parking subscriber receives confirmation tone.
  - If all system park slots are in use, the parking subscriber receives reorder tone.
  - When idle to retrieve a parked call, the subscriber uses the System Park key and enters the system park slot number (0-9) manually.
- Optional for Keyset and DFT without display:
  - To park a call to system, the subscriber uses a System Park key and enters the system park slot number (0-9) manually.
  - If the call has been parked successfully, the parking subscriber receives confirmation tone.
  - If the requested system park slot is currently in use,
    - the parking subscriber receives dial tone again,
    - the parking subscriber uses the System Park key and enters another system park slot number (0-9) without going on-hook.
  - If the call cannot be parked (e.g. all system park slots are in use), the parking subscriber receives reorder tone.
  - When idle to retrieve a parked call, the subscriber uses the System Park key and enters the system park slot number (0-9) manually.
- For Attendant/ACWin:
  - To park a call to system, the attendant/ACWin dials the park code followed by the system park slot number (0-9). Additionally, it can use the Direct Destination Selection (DDS) key which has been programmed with the system park access code plus the system park slot number (0-9).
  - If the call has been parked successfully,
    - the attendant/ACWin receives confirmation tone,
    - the used system park slot number is displayed.
  - If the requested system park slot is currently in use but another system park slot is available, the system will place the call in the alternate system

park slot and the system park slot number is displayed where the call has been parked.

- A call left on park is recalled to the parking party after a time-out of a System Park recall timer or to the Attendant/ACWin dependent upon the system parameter (COT parameter SPAH) and the state of the parking party at time-out (idle, busy or out of service).

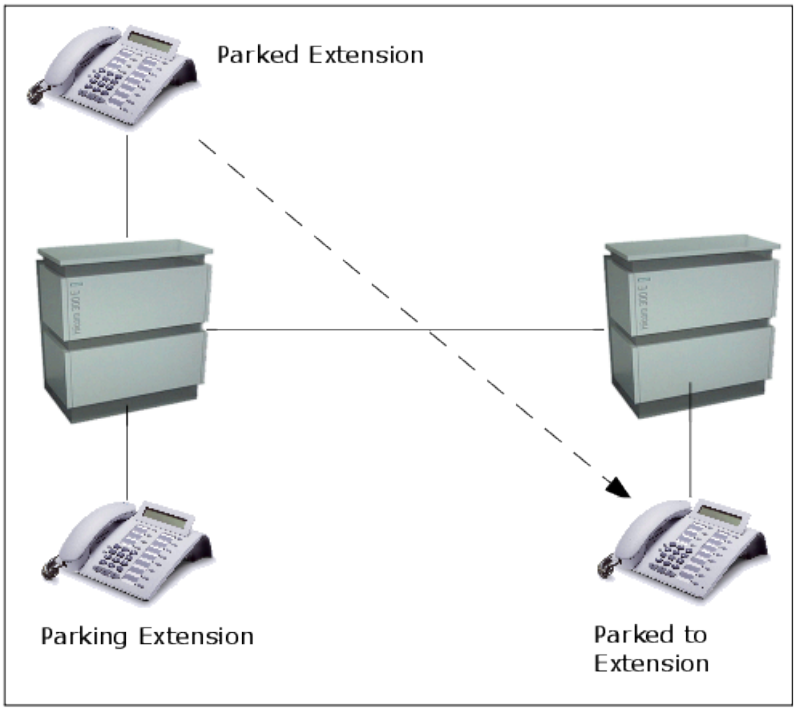
10.14.1.3 Service information

- The System Park feature is a local feature and not available network-wide.
- The system contains 10 System Park slots (0-9), which cannot be configured via AMO-DIMSU.
- 100% of the telephones have access to the System Park feature except functional devices.

10.14.2 Directed Call Parking

10.14.2.1 Feature Description

The feature direct call parking permits a user to park a two-party connection directly with another terminal (directing device).



The user (any terminal type) is able to use Directed Call Park to park a call at another extension whether local or network wide. The call can be parked onto a free or busy extension.

10.14.2.2 User Interface

The user with a call that they wish to park on another extension, dials a feature code followed by the extension number of the user on whom the call is to be parked:-

If the called party is idle, the call is held at the called party. It does not ring the terminal. The called user dials reconnect to connect to the held call. If the called user does not pick-up the call within a configured period of time, the held call will ring the extension.

If the called party is busy, they will receive audible and visible (if possible) notification of the call and the call will be held. The called user will dial reconnect to connect to the held call. If the called user fails to answer the call within a configured period of time, the call will be treated as a call that has been held too long and may be re-directed to the parking party.

10.14.2.3 Feature Operation by User Terminal

The Directed Call Park feature can be used to park a call to a designated extension anywhere within the network,whether the extension is idle or busy, but providing that the park position is idle and the call is able to be parked e.g. the caller to be parked is not barred from being held.

The parked call can be picked up at the parked to terminal by dialling 'reconnect', or from any other extension within the network by invoking Directed Call Pick-up and then keying the directory number of the parked to extension.

Note. It will not be possible to park a call to the pilot number of a hunt group.

The following exceptions apply:-

It is a requirement that a user will not be able to park a call from the Attendant; or park a call to an Attendant position.

It will not be possible to invoke park from a functional terminal.

The following detailed feature invocation descriptions include the parking (A party), parked (B party) and parked to (C party).

10.14.2.3.1 Directed Call Park Feature Invocation from Anates

- Parking user

  From an active call i.e. talk state, the user enters consultation state, receives dial tone and keys the feature access code. User then dials the directory number of the desired location to which the call will be parked;

  OR

  From an active call i.e. talk state, the user enters consultation state, receives dial tone and keys the feature code for self-park. The call is parked and the user hears positive acknowledgement tone and is free to make further calls;

  OR

  User hears negative acknowledgement tone and the user can now return to the calling party or can re-try the feature (e.g. attempt to park to a different extension); or the user can use another feature.

- Parked user

  Once parked, user receives 'holding' tone as appropriate to the system. User can now only wait for re-connection or hang up.
- Parked to user

  If the parked to user is idle when the call is parked, then the user will be given no indication (the requirement is that the call is parked without ringing the terminal). However, whilst the park-timer is running the user will be given special dial tone if they go off-hook. After the park-timer expires then the terminal will be alerted if idle, or when they becomes idle.

  The parked to user cannot receive further incoming calls, but can make outgoing calls.

  If the parked to user is busy when the call is parked, then the user will be given audible notification in the form of camp-on tone.

  In the case of parking to a busy user, the call is transferred into camp-on and is then treated as a normal camp-on call.

Pick-up of parked calls

There are 2 ways that a user can connect to a parked call:

1) Reconnect

and

2) Directed Call Pickup

From the station at which the call is parked, the user can connect to the parked call by dialling the feature code for 'reconnect'.

A user can connect to the call from any other eligible station in the network by invoking the feature Directed Call Pickup, and then keying the directory number of the parked to extension.

10.14.2.3.2 Directed Call Park Feature Invocation from Terminals (with display)

For users with terminals without display refer to invocation from Anates

There are 2 ways that an user (with display) can invoke the feature:

- From talking state (Dialogue menu); this is only for a first call. Feature invocation is not possible from a consultation call (i.e. secondcall);
- With feature access code (for a first call only).

From Dialogue menu

1) Parking user

From an active call i.e. talk state (first call only),the user scrolls to the feature with the right arrow key until the display shows the new selection directed call park

This is accepted by ok (tick button)the user is then prompted to dial a park location (parked to station

The user then keys the station number of the parked to extension.

OR

The user dials the code for their own station to self park to park the call on their own station The call is parked and the user is free to carry on making normal calls

The user is provided with advice that a call is parked

2) Parked user

the display of the parked terminal shows "please wait" and the parked call gets no indication of whether the call is parked at the parking station or not

3) Parked to user

If the parked to user is idle when the call is parked,then the user will be given no indication (audible or visual). However, whilst the park-timer is running the user will be given special dial tone if they go off-hook. After the park-timer expires then the terminal will be alerted if idle, or when becomes idle.

If the parked to user is busy when the call is parked, and the parked to user has Call waiting set to on then the call is transferred into camp-on and is then treat as a normal camp-on call.

The displays are the same if the user invokes the direct call park feature by feature access code

Pick up of parked calls

Connecting to a parked call is possible in the following ways:

- From any eligible end device by invoking the feature Directed Call Pickup,and then keying the directory number of the parked to extension.
- From the station at which the call is parked by keying the 'reconnect' code.
- From the station at which the call is parked by invoking 'reconnect' from the Idle menu, or from the dialling state (Dialogue menu).Note the option "Reconnect " is only offered if a call is parked on the terminal

10.14.2.3.3 Directed Call Park Feature Invocation from AC

The following description is applicable to AC4 on Upoe interface

The Attendant needs to be connected to the call in order to invoke the feature. The Attendant then enters consultation state by pressing the consultation key and dialing the feature code.

The Attendant keys the directory number of the terminal to which the call is to be parked and if sucessful the call is released from the attendant console.

Call Pickup

The attendant can reconnect to the parked call by using the direct call pickup feature code

Recall

If the parked call is recalled to the Attendant then it is queued as for a normal recall

10.14.2.3.4 Directed Call Park Feature Invocation from ACWin (MQ)

The Attendant needs to be connected to the call in order to invoke the feature.

The Attendant then enters the consultation state by pressing the consultation key and dials the feature code. Note. Only invocation from feature code is possible.

The Attendant keys the directory number of the terminal to which the call is to be parked.

The display information presented to the Attendant is <FC><DN> in the status field.

If the call is successfully parked, then the attendant will receive the message 'PARKED', the call is released from the Attendant and the loop key becomes free.

If the call is not successfully parked, then the attendant will receive the message

'NOT POSSIBLE', and the call will remain on hold.

in the OpenScape 4000 it is not possible for the Attendant to Retrieve the parked call, since the OpenScape 4000 Retrieve solution is not based upon Pickup. The attendant will be able to 'reconnect' to parked calls by invoking the feature Directed Call Pickup.

Parked Calls Recalled to Attendant

When a parked call is recalled to the attendant, for whatever reason, then it will be presented to the source button assigned for recall and queued if necessary.

To connect to the recalled party, the Attendant clicks on the recall source button or presses the recall source key on the P.C. keyboard

10.14.2.4 Service Information

Connections from conference calls and calls in consultation state cannot be parked.

The Parked to extension at the time of being parked to can be either free or busy.

This feature is only available for the service Voice.

For network-wide use of the feature Cornet NQ at issue 2.2 is required

10.14.2.5 Interworking between devices

Terminal/Set	Parked	Parking	Parked to
All digital devices	X	X	X
CMI	X	X	X
AC/Centralised AC	-	X	-

Terminal/Set	Parked	Parking	Parked to
Float Anate	-	-	X
Hunt groups or ACD numbers	-	-	-
DSS1 Terminals	X	-	-
DPNSS1 Gateway (PBXXX)	X	X	X
All remaining ISDN devices (Voice service only)	X		

10.14.3 Call Park Within a Pickup Group

This is the original call park feature with which a call park slot is created per pick up group

10.14.3.1 User Interface

Digital telephones require a Park key with an led.

A call in talk state can be parked by pressing the Park key. All members of the same pickup group as the parking terminal recieve a visual indication via the park key led flashing.

A call can be retrieved from Park by any member pressing the park key

After a congfigurable time-out the Parked call recalls back to the parking station and signals as a group pickup call ,depending on the pickup group settings,on other members of the pickup group.

10.14.4 Generation (Example)

10.14.4.1 System Park

Assign System Park access codes (park code + system park slot number):
`ADD-WABE:CD=<XYZ0>,DAR=PARK;`

Note: This command assigns all 10 System Park access codes XYZ0-XYZ9 in one single step.

- The standard key layout 7 contains the System Park key. A digital telephone (Keyset or DFT) with access to the System Park feature via System Park key could be configured with standard key layout 7. However this, as standard ,is for a 3 button digital telephone

  Assign System Park key to digital telephone (Keyset or DFT) which is configured with standard key layout different to7:
  `CHA-TAPRO:STNO=4711,STD=n,DIGTYP=OPTIT19,KYm=SPARK;`
- Change timer value for System Park recall timer:
  `CHA-CTIME:TYPESWU=CP2,SYSRCPAR=x;`

- Optional, assign COT parameter SPAH to COT class n of an used digital or analog trunk:
  `CHA-COT:COTNO=n,COTTYPE=COTADD,PAR=SPAH;`

10.14.4.2 Directed Call Park

- Releasing the feature for the system
  `CHANGE-FEASU:TYPE=A,CM=DCPA;`
- Enable the direct call pickup feature (to connect to a call parked on another station)
  `CHANGE-FEASU:TYPE=A,CM=DIRCPCKP;`

  To allow the user to use the feature direct call park feature access codes are required
- Adding code for direct call parking
  `ADD-WABE:CD=<cd>,DPLN=<no>,DAR=DCPA`
- Adding the code to allow users to self park a call
  `ADD-WABE:CD=<cd>,DPLN=<no>,DAR=SELFPA;`
- Adding the code so that the parked call can be accepted i.e. reconnected
  `ADD-WABE:CD=<cd>,DPLN=<no>,DAR=RECONNPA;`

  There are three timers that need to be configured for recalls for direct call parked calls
- The park timer T1 which is started with parking on a free station changed as follows
  `CHANGE-CTIME:TYPESWU=CP2,DCPA1=20 */20 seconds*/`
- The recalling timer T2 for the feature direct parking is added as follows
  `CHANGE-CTIME:TYPESWU=CP2,DCPA2=30 */30 seconds*/;`

  The timer T3 which is started when a call is parked to a busy station is as follows
  `CHANGE-CTIME:TYPESWU=CP2,DCPA3=5 */5 seconds*/`

  Timers DCPA1/DCPA2 are consecutive ie DCPA2 begins when DCPA1 expires. DCPA2 also begins on the expiry of DCPA3.

  Note regarding user indication and timer interreaction.

  During DCPA1 a call is parked to an idle station, the parked to station recieves no indication the call is parked, the Parked station recieveds hold tone.

  Upon the expiry of DCPA,1 DCPA2 begins. The Parked To station recieves ringing and the Parked station Ringback tone. When DCPA2 expires the call recalls to the Parking station.

  DCPA3 begins when the call is parked to a busy station. During this time the Parked To station recieves no indication of the parked call the Parked call recieves hold tone. Upon expiry of DCPA3, DCPA2 begins as before. The user indication depends upon the Parked to ststion having Camp on enabled. If camp on is enabled then the Parked call will indicate with a beep tone on the Parked To station as any camped on call would do.The Parked station would at this time hear ring back tone. If camp on is not enabled at the Parked To station then the call remains in the same state as it was

during the DCPA3 timer until the expiry of DCPA2 after which it recalls to the Parking station.

For Network wide use of the feature the following changes needed to be made in the class of trunk

- To enable the feature network wide
  `CHANGE-COT:COTNO=<no>,COTTYPE=COTDEL,PAR=DCPA;`

  Note: DCPA is for barring the feature to a system that cannot support directed call park
- To enable the feature to work with Attendants
  `CHANGE-COT:COTNO=120,COTTYPE=COTADD,PAR=RCL;`

  /* Recall to AC if user hangs up in Consultation call
  `CHANGE-COT:COTNO=120,COTTYPE=COTDEL,PAR=RCLS;`

  /*suppression of Recall to AC/*

10.14.4.3 Park within a Pickup group

- Configure a pickup group
- Enable a Park key on the telephone
  `CHA-TAPRO:STNO=4711,STD=n,DIGTYP=OPTIT19,KYn=PARK`

10.14.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
WABE	PARKEN	d	Gespräche parken/wiederholen auf/von System Parkplatz
	PARK	e	call park and retrieve to/from system park slot
	DCPA	d	parken eines tln bei einem bestimmten tln
	DCPA	e	Code to park a call on another user
	SELFPA	d	parken eines teilnehmers bei sich
		e	Code to park a call at ones own station
	RECONNPA	d	wiederverbinden mit dem geparkten teilnehmer
	RECONNPA	e	Code to reconnect to a parked call on own station
	AUNGEZ	d	gezielte anrufuebernahme
	PUDIR	e	Direct call pickup code to reconnect to call parked on a different station

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
TAPRO	SPARK	d	System Park Taste
		e	system call park key
	PA	d	Park taste
	PARK	e	Park key
CTIME	SYSRCPAR	d	System Park Wiederanrufzeitglied
		e	system park recall timer
	DCPA1	d	gezieltes parken - zielteilnehmer ist frei
		e	Directed call park park destination is idle
	DCPA2	d	gezieltes parken - wiederanruf beim parkenden
		e	Recall timer of the parked party
	DCPA3	d	gezieltes parken - zielteilnehmer ist besetzt
		e	Directed call park park destination is busy
COT	SPAH	d	nach Wiederanrufzeitgliedablauf wird ein geparkter oder gehaltener Teilnehmer zum Vermittlungsplatz weitergeleitet
	SPAH	e	on recall timer expiry, a parked or held party is routed to the attendant

10.15 Connect Key

10.15.1 Feature Description

A digital feature telephone or Keyset has limited function keys. To make access to multiple functions from one key possible the Connect Key is introduced.

CONNECT KEY combines the following functions

- Toggle in consultation and between foreground / background
- Pick up a camp-on call
- Pick up a call from a pick up group

Where toggle and pick up are possible at the same time the toggle function supersedes pick up.

10.15.2 User Interface

No access code is required for the feature Connect Key. The feature is implemented by a new Key in AMO TAPRO.

When presented with a group call the user can pick up the call by pressing the connect key. (pick up function)

When in consultation with a third party the user can toggle between the held party and the consulted party by pressing the connect Key (Toggle Function)

Whilst in talk state the user can connect to a waiting call (if camp on at that station is set) by depressing the Connect Key. (Camp -On pickup)

From the service menu function the user can display the key function but reprogramming of the key from the service menu will not be possible.

10.15.3 Service Information

The feature Connect Key is a pure Software feature and requires no hardware changes.

Only one appearance of the Connect Key is possible per terminal

10.15.4 Generation (Example)

The Connect key function is valid for optiPoint telephones .

- Add a Connect Key on key 19:
  `CHANGE-TAPRO:STNO=7445,DIGTYP=OPTIT19,KY19=CNCT;`

10.15.5 Relevant AMOs

AMO	Parameter	Spache/ Language	Beschreibung/Description
TAPRO	TDxx	d	Neuer taste CNCT
TAPRO	KYxx	e	New key CNCT

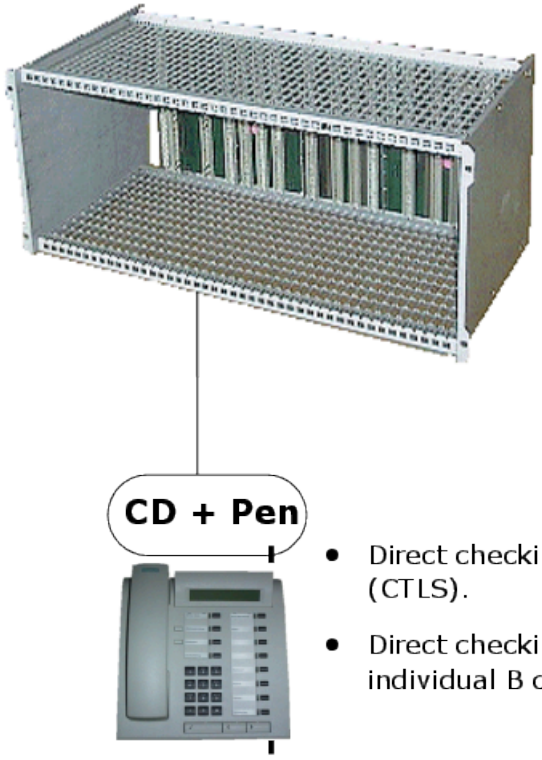
IMPORTANT: The AMO description of the Connect Key defines it as Connect to call on hold.

10.16 Controlled Trunk and Line Selection

See also Chapter 196, "CTLS - Controlled trunk and line selection network-wide" and Chapter 195, "CTLN - Prevent controlled line and trunk selection in an external system".

With the feature Controlled Trunk and Line Selection (CTLS) you can seize and check trunk circuits and subscriber line circuits selectively by directly entering the appropriate PEN.

CTLS is available for trunk and tie lines as well as SLMA and TMOM connections.



- Direct checking with one COS only (CTLS).
- Direct checking of ports and individual B channels.

10.16.1 Feature Description

With CTLS, authorized users can seize analog and CAS trunk circuits, digital B channels and also SLMA and TMOM connections (only announcement devices) by entering (dialing) the PEN and, if necessary, the B channels. VMX connections on SLMA and digital trunk circuits belonging to nailed connections cannot be selectively seized. By analyzing the reception of predefined tones the authorized user can recognize the state of the PEN or the terminal to be tested.

Analog trunk circuits, CAS trunk circuits and digital circuits can be trunk and tie lines.

CTLS can be used in OpenScape4000/HiPath 4000 networks. The seizure of trunks or subscriber line circuits by entering the PEN is only possible within CorNet-NQ networks.

If in transit connections an outgoing analog, CAS or trunk circuit is seized by entering the PEN, the dialing of the PEN cannot be continued in the next PBX.

Regardless of the following PBX type, the connection can be established by dialing a station number. The signaling method configured for the seized circuit is used.

If in transit connections within a Cornet-NQ network the outgoing circuit is seized by dialing a station number and not by entering the PEN, the dialing of the PEN cannot be resumed in the next PBX.

IMPORTANT: This feature only applies for the VOICE service.

10.16.2 Effects on other Features

Connection establishment using CTLS has the following restrictions (in contrast to LCR):

- If SLMA stations are seized, any active transfers of ringing, call forwarding no answer, call pickup groups and intercept cases are disregarded, provided the SLMA station is configured in the same PBX as the station used for CTLS or if the PBX where the SLMA station is configured is reached via CorNet-NQ.
- Hunting group number: Any attempt to reach a station by dialing the hunting group number is rejected if the station is configured in the same PBX as the station used for CTLS or if this PBX was reached via CorNet-NQ. Master hunting group: The master is seized if the hunting group number is dialed. The hunting group function is ignored, if the station is configured in the same PBX as the station used for CTLS or if this PBX was reached via CorNet-NQ.
- If an interim destination reached using CTLS is busy, the connection can only be reestablished, after the caller goes on-hook. Rerouting is not performed.
- A CTLS entry cannot be saved for number redial. Strings, and parts thereof, with a maximum length of 22 characters can be saved under destination and repertory keys.
- Callback on busy and free is not possible.
- During an active CTLS connection all third-party features such as consultation hold, transfer, broker's call, conference, etc.) are blocked for the dialing station.
- It is not possible to establish a CTLS connection from a third-party connection.
- The destination reached using CTLS cannot activate any third-party features during the connection if the destination is configured in the same PBX as the station using CTLS or if this PBX was reached via CorNet-NQ.

10.16.3 User Interface

10.16.3.1 Data editing for CorNet-NQ

- The A station (checking party) first enters:

  <Code CTLS>

  After this code is identified and the CTLS classmark was successfully checked, a digit counter is initialized. If the user has no authorization any further inputs are rejected ('NOT AUTHORIZED' and a corresponding tone).

- With proper authorization the user enters

  #<PEN># or #<PEN>*

  A 'CTLS' flag, as well as a 'PEN' flag, are set and the digit counter is incremented depending on the length of the PEN. These values together with the entered PEN are stored in the CPB and transmitted to CorNet-NQ, depending on the interface to be defined.
- The successful seizure of the previously entered PEN initiates the following procedure: The test is terminated, if another '#' is recognized (not after an *, see below). If

  <PEN># or # <PEN>*

  is entered again, the PEN is saved in the CPB and then transmitted to CorNet-NQ, together with the updated digit counter and the 'PEN' flag, depending on the interface to be defined.
- If the last character entered was a '*' then a station number must now be entered:

  <Station number>#

  This station number is saved in the CPB and then transmitted to Cornet-NQ, together with the updated digit counter and the 'Station number' flag, depending on the interface to be defined.

  The actual node checks for the following:
- If the DAR of this station number established in WABE leads to a trunk, then the trunk is only seized and the station number transmitted, if the parameter CTLS is set in COT for the corresponding trunk group.
- If the DAR established in WABE leads to a station ('STN'), the following is checked:
  - If the station number is a hunting group number, the number is not transmitted and the test is terminated.
  - If the destination number is configured in the same PBX as the A station or if the destination switch was reached via CorNet-NQ, the destination is dialed as usual. Call forwarding, call forwardings on no answer, call pickup groups and intercepts, however, are disregarded.
  - The 'Station number' flag is set. The station number is saved in the CPB, together with the updated digit counter and the flag. After the station number is transmitted, the test is terminated.

  If the last entered character was a

  '#'

  then the procedure is continued as described under A), provided a PEN was specified.

Notes:

1) General notes:

- If the end criterion '##' of the CTLS test is entered, all trunks concerned remain seized. The tone injected after the entry of the first '#' remains audible. A ringing status can change to call status and a call status reached before the input of the second '#' also remains established.
- If a station number is entered with a destination other than in the current PBX, then LCR is no longer avoided. Call charges are accrued, if this station number leads to a CO trunk!

- The terminals used for the CTLS test are protected agains camp-on for the test duration.Emergency override / disconnect during CTLS Test is possible

2) Notes on terminal key behaviour

- CTLS is used for line testing. Therefore, only digit and repertory keys are supported. One station number or, alternatively, one PEN can be stored per repertory key. The use of other keys will be rejected, in particular an attempt to establish a 3-party connection.
- AC: If the AC is called during start-of-dialing for the CTLS test and the operator presses either the Personal key or the OPR key to accept this call, the CTLS test is terminated. If, however, the AC is called during a CTLS call, the call can be accepted by pressing the Personal or OPR key. The CTLS call remains in the background and can be resumed by pressing the DIAL key.
- During the CTLS test, the CLEAR key on the AC has the same effect as the RELEASE key, i.e. the CTLS test is terminated.
- With the exception of the repertory keys and the other keys mentioned above, all other AC keys are rejected.
- DIGITE: If the DIGITE is called during start-of-dialing for the CTLS test and the user presses the "Call waiting" key to accept this call the CTLS test is terminated. If, however, the DIGITE is called during a CTLS call, the waiting call can be accepted by pressing the "Call waiting" key. The CTLS call remains in the background and can be resumed by pressing the TOGGLE key. Conference and call transfer are not possible.
- With the exception of the repertory keys and the other keys mentioned above, all other DIGITE keys are rejected.
- With ANATE, the callback key for establishing a 3-party connection is rejected. All keys, with the exception of the digit keys, are not supported.

3) Notes on networking:

- In a network, CTLS connections are signaled as such, if possible. If, e.g. the last entry for a CTLS test is a station number which leads to the digital network via a DAR and the trunks seized using LCR are "CTLS capable", then the CTLS test task is transmitted via these trunks. A log printout is generated in every transit node.
- If a breakout to an analog network is achieved by entering the PEN, the test is terminated. In this state, in the best case (i.e. the trunks could be seized by CP), the information signalled inband depends on the type of CO trunk. With signalling without dialing tone from CO (e.g. MFC-R2) there are no audible tones. In this case, dialing to CO should be allowed (COT CTLS set on the trunk), e.g. to reach a test tone transmitter. However, this should only be a temporary solution and not become the rule as this procedure allows abuse as call charges can no longer be assigned to the originating party. The charges can only be assigned at a later date by a comparison of the test log printouts.
- The test possibilities are also restricted for trunk circuits which need complex information from the LCR in order to be seized (e.g. CIS signalling with ANI). This information is normally not available for CTLS seizures.

10.16.3.2 Provision of path selection

In the incoming seized PEN the digit counter is reset and the protocol delivered by CorNet-NQ is evaluated by converting the digit string into a PEN, if the 'PEN' flag is set.

The test is terminated in the following cases:

- if the end criterion '##' is recognized. There is no system reaction.
- after the station number entered under <Station number># is transmitted; the system reaction configured for end-of-dialing is carried out;
- if the entered station number is a hunting group number (will not be transmitted); the NU tone is injected;
- if the station number exceeds 22 digits; the configured system reaction is carried out;
- if the syntax of the entered PEN is incorrect; the NU tone is injected;
- for the defined error cases (PEN busy, not existent or invalid for CTLS, PEN is defective) the configured tones are injected (busy tone, NU tone, negative acknowledgement tone);
- if the outgoing seized trunk was an analog trunk, a CAS or a trunk circuit and further PENs were dialed; the NU tone is injected;
- if a station number which leads to a circuit is transmitted and the CTLS parameter is set in the COT for the outgoing trunk group; the system reaction configured for end-of-dialing is carried out;
- after the evaluation of the station number and before the circuit is seized, if the CTLS parameter is not set in the COT of the outgoing trunk group; the connection is backwards released to the originating node;
- if an SLMA terminal (exception:VMX) is administrated on a selected PEN. The corresponding tones are injected, depending on the station status.

IMPORTANT: If analog, CAS or trunk circuits are seized without station number, the reception of the dialing tone cannot be guaranteed, e.g. with MFC/R2 dialing or analog tie lines. These cases require specialist knowledge of the paths to be tested.

10.16.3.3 System Reactions

For user guidance, a tone is injected after every PEN that is selected. The following cases are discriminated:

- PEN x seizes CorNet-NQ circuit: First ring tone from the reached PBX (FRNGBK);
- PEN x seizes analog or CAS tie trunk: Dialing tone from the reached PBX, if dialing tone injection is configured for this tie trunk;
- PEN x seizes trunk circuit: The proper CO dial tone is injected;
- PEN x seizes SLMA circuit: Connection of the corresponding terminal (exception: VMX). With anate the ring tone is injected and the ring tone is injected at the calling party (RNGBK);
- PEN x seizes line circuit. The then dialed station number is not transmitted because the CTLS parameter is not set in COT (NU)
- PEN x or destination of station number is busy: busy tone (BUSY);

- PEN x is non-existent, invalid for CTLS or overdefined: NU tone is injected (NU);
- PEN x is defective/out of order: Negative acknowledgement tone (NACK);

If a station number is entered and the connection is established via transit PBXs, these PBXs do not transmit any tones.

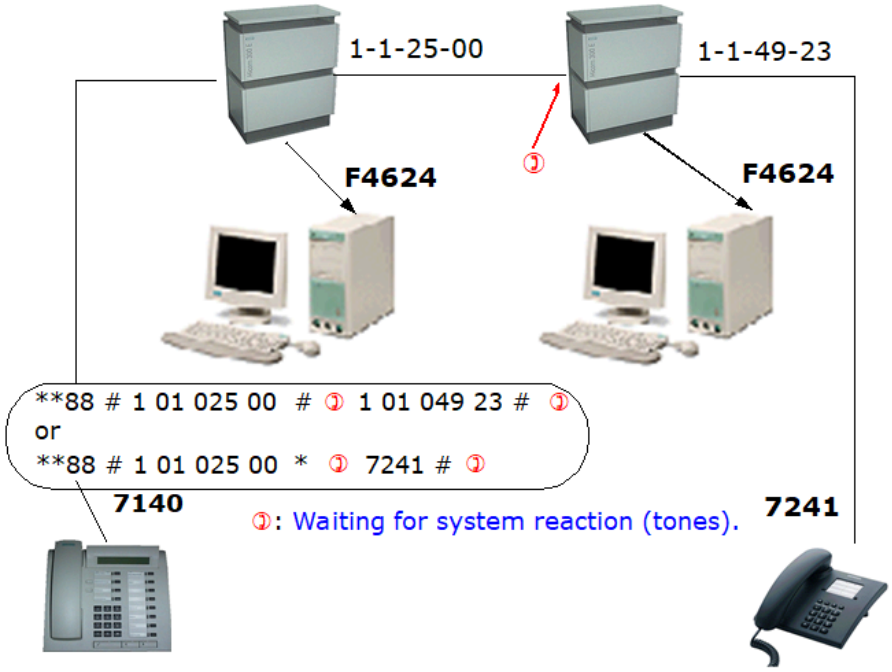
NOTICE: When dialing a number after * to a none NQ system, the CPTIME CTLS2 to must have expired to allow dialing.

10.16.4 Service Information

- The user interface is uniform for the selection of lines and SLMA circuits. For the necessary dialing information the AMOs TACSU, SCSU, TSCSU and TDCSU are displayed.
- Any CTLS input must start with the specification of a PEN.
- Within a CTLS input it is possible to change once from the input of PENs to station number dialing.
- The system reactions after every input of a PEN inform the user of the status of the dialing destination or any operating errors.
- In addition to authorization assignments, CTLS is classed as a service case and therefore every call of the application is logged. A protocol message is output for every application (maintenance message F4624 in text form).
- In the originating node, this protocol message contains the station number of the user and the selected PEN. In every transit node, which was reached via CorNet-NQ, this message contains the incoming seized PEN, and the PEN or station number used to reach the outgoing seized trunk.
- All messages have a code which identifies them as being generated by CTLS.
- The user's station number is not the administrated station number of the used terminal, if the user has identified himself on this terminal using PIN network wide.
- The authorization assignment for CTLS using DMS/CM-Win is prevented.
- CTLS is provided for use on digital terminals. This includes also the AC.
- CTLS is also possible on Anate, provided it can handle DTMF or an external DTMF transmitter is used. i.e. a hand held tone sender.
- Functional terminals (e.g. set600), DSS1 termnals and CMI terminals are excluded.
- An authorized user can activate this authorization by network-wide identification on other terminals. Transmission of the CTLS authorization using PIN network-wide via CorNet-NQ is supported.
- CTLS is used to seize trunks avoiding LCR. This means
  - CDR is not possible,
  - the blocking of destination numbers is circumvented and
  - ITR and Closed User Groups are ignored.
- After outgoing seizure of a trunk using CTLS the station number transmission is prevented by default. Transmission is only possible, if the newly introduced COT parameter 'CTLS' is set in the corresponding trunk group. This also applies for CorNet-NQ circuits, as a breakout to CO via PBXXX and DPNSS is possible here.

- A "normal" dialing-in via trunk or tie lines and subsequent use of CTLS as DISA feature is prevented.
- An entered station number is only transmitted after the entry of a # (en-bloc dialing). If the selected PEN has previously seized a cutdial circuit, a correct connection establishment cannot be guaranteed.

10.16.5 Generation (Example)



The testing circuit 7140 can establish the following test connection:

1) via tie line and PEN of station 7241
2) via tie line and station number of station 7241

After the connection to the second PBX is established, a continuous tone is injected. Then the remaining digits can be entered.

This selection can be made via several nodes.

- Configure Wabe:
  `ADD-WABE:CD=**88,DAR=CTLS;`
- Set the authorization:
  `ADD-COSSU:NEWCOX=xx,AVCE=CTLS;`
- Set COT for the trunks:
  `ADD-COT:COTNEW=xx,PAR=CTLS,INFO="Selective line seizure";`
- Set "TESTLN" in WABE:

  If a test station is to be tested in the CTLS test, the DAR TESTLN with the CPS 10&11 must be set for this station. For the outgoing trunk the COT CTLS must also be set.
  `ADD-WABE:CD=**89,CPS=10&11,DAR=TESTLN;`

- Set the test tone length

  With CTLS the test tone injection is timer controlled. The duration of the test tone can be set using the CP timer CTLS1 (AMO CTIME, TYPESWU=CP).

```
CHA-CTIME:TYPESWU=CP2,CTLS1=20;      /*inject test tone
 for
20 seconds
```

10.16.5.1 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
COSSU	GLTA	d	gezielte Leitungs- und Teilnehmerwahl
	CTLS	e	controlled trunk and line selection
CTIME	GLTA1	d	gezielte Leitungs- und Teilnehmeranwahl timer 1
	CTLS1	e	controlled trunk and line selection timer 1
	GLTA2	d	gezielte Leitungs- und Teilnehmeranwahl timer 2
	CTLS2	e	controlled trunk and line selection timer 2
COT	GLTA	d	gezielte Leitungs- und Teilnehmerwahl
	CTLS	e	controlled trunk and line selection
WABE	GLTA	d	gezielte Leitungs- und Teilnehmerwahl
	CTLS	e	controlled trunk and line selection

10.17 Data Security at the Terminal

10.17.1 Feature Description

This feature is valid for the following terminal types:

- optiPoint 410/420 HFA
- OpenStage T
- CP400/CP600 phones (HFA)

Depending on the level, this feature inhibits unauthorized access to key contents and the corresponding key functions for every type of terminal which is released for this feature.

3 level locking possibilities

a) protected functions
Electronic Notebook (ENB)

b) Servicemenu key
Callback
Do-not-disturb
etc.

c) Dialing aid:
Repertory key
DSS key
Timed reminder
Number redial
Speed dialing

Activation by:

User **Attendant** **Time /**

- Locking is possible for individual users and groups.
- Locked features can't be activated by using a feature code.

10.17.2 Service Information

- This feature need not be dimensioned (AMO CODEW, AMO DIMSU), nor is a special release necessary (AMO FEASU)
- After setting the appropriate protective parameters using AMO SDAT, the feature is effective with every activation by a COS changeover.

  Additionally, the data security can be activated at OpenStage 40/60/80 by long pressing the # key.
- Locking possibilities can be combined.
- The terminal is protected depending on the COS.

10.17.3 Generation (Examples)

Activation of access protection (here: for station 7140):

10.17.3.1 Query whether the required protective parameters have been set

```
DIS-SBCSU:STNO=7140;
```

or

```
DIS-SDAT:STNO=7140,TYPE=SUBDATA;
```

Attributes already set can be found either under the SUBSCRIBER ATTRIBUTES (AMO SDAT) section of the DIS-SBCSU output or under the ATTRIBUTES section of the DIS-SDAT output.

10.17.3.2 Set the required (e.g. all) protective attributes

```
CHA-SDAT:STNO=7140,TYPE=ATTRIBUT,AATTR=LOADF&LOSC&LOENB;
```

The terminal is locked by COS changeover. There are several possibilities to change the COS :

- on a terminal with ID card reader by inserting/pulling through the ID card
- from the terminal by dialing procedure
- from the attendant console
- from the service terminal (AMO BERUM)
- after timeout for an entire COS changeover group

10.17.3.3 Reset the corresponding protective attributes

1) `CHA-SDAT:STNO=7140,TYPE=ATTRIBUT,DATTR=LOADF&LOSC&LOENB;`

Regardless of the set COS, all previously locked keys and functions can now be accessed.

10.17.3.4 Configuration of the COS changeover (BERUM)

IMPORTANT: BERUM need only be set if the feature has not yet been configured.

```
DIS-WABE:TYPE=GEN,DPLN=0&&15,DAR=ACOSX&DCOSX;
```

If necessary, configure codes (e.g. *18 for activation and #18 for deactivation) either DPLN dependent (code is only valid for one or several DPLN, such as 0 to 5) or DPLN independent (without specification of the DPLN parameter) with:

```
ADD-WABE:CD=*18 [,DPLN=0&&5] ,DAR=ACOSX,CDDP=818;

/* CDDP as substitute code */

/* for non DTMF devices  */
 ADD-WABE:CD=#18 [,DPLN=0&&5] ,DAR=DCOSX,CDDP=8018;

/* CDDP as substitute code */

/* for non DTMF devices  */
```

10.17.3.5 Configure the Authorization for "COS Changeover with Code"

Establish COS1 and COS2
`DIS-SBCSU:STNO=7140;`

or
`DIS-SDAT:STNO=7140,TYPE=SUBDATA;`

Query the COS authorizations:
`DIS-COSSU:TYPE=COS,COS=<cos1>&<cos2>;`

Should the authorization COSXCD not be set in the column VOICE, the authorization has to be added to the COS of the station" :
`CHA-COSSU:TYPE=COS,COS=<cos1>&<cos2>,AVCE=COSXCD;`

10.17.3.6 Configure the station-specific COSXCD for BERUM

Query if a PIN is assigned for BERUM.
`DIS-PERSI:TYPE=STN,STNO=7140,PINTYPE=7;`

If no specification has been made, check that the preconditions for configuring COSXCDs have been met:
`DIS-PERSI:TYPE=SYS;`

Define the general code length for the COS changeover (e.g. every COSXCD has 4 digits), if necessary:
`ADD-PERSI:TYPE=SYS,COSLEN=4;`

Configure the COS changeover code for the station (e.g. 1234), if necessary:
`ADD-PERSI:TYPE=STN,STNO=7140,COSXCD=1234;`

10.17.3.7 Activate/deactivate COS changeover from the terminal

Input of the activation code (from WABE ACOSX e.g. *18) followed by COSXCD (as added in AMO PERSI e.g.1234) on the terminal. After the changeover, a special dial tone should be injected instead of the normal one, when the handset is lifted.

Enter the deactivation code to unlock the respective keys or functions:

Enter the deactivation code (e.g. #18) on the terminal. After the COS changeover the normal dialing tone is injected when the handset is lifted.

Delete the protective parameters for the station to unlock the keys after a COS changeover:

10.17.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
SDAT	EMERK	d	EMERK=SPAWH Sperre aller Wahlhilfefunktionen, d.h. der Ziel-, Direktruf-, Wahlwiederholungs-, Kurzwahl-Taste EMERK=SPSC Sperre der Check-Funktion (für Endgeräte ohne Display) bzw. des Service Menüs, d.h. es kann • keine Umleitung (fest oder variabel) programmiert oder abgefragt werden. Die feste Umleitung kann hingegen aktiviert und jede Umleitung (fest oder variabel) deaktiviert werden. • kein Direktruf, Rückruf, Termin, keine Wahlwiederholung (SNR, LNR), Zielwahl programmiert oder abgefragt werden. • kein Anrufschutz, Ansprechschutz aus- oder eingeschaltet werden. • keine Tastenbelegung geändert werden. EMERK=SPENB Sperre des Elektronischen Telefonbuchs.

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
	AATTR	e	AATTR=LOADF Locking of all dialing aid functions, i.e. the repertory, DSS, number redial and speed dialing keys AATTR=LOSC Locking of the Check function (for terminals without display) or the service menu, this means • no forwarding (fixed or variable) can be programmed or queried. However fixed forwarding can be activated and both forwarding types (fixed or variable) can be deactivated. • no DSS call, callback, timed reminder, number redial (SNR, LNR), repertory dialing can be programmed or queried. • no DND, stop voice calling can be activated or deactivated. • no key layout can be modified. AATTR=LOENB Locking of the electronic telephone book.

10.18 Desktop Callback Idle Display Option

10.18.1 Feature Description

It is possible to display the mailbox (callback messages) when the phone is in idle state. This feature is only for digital phones. The phone will display the mailbox instead of the idle display, but only if there are callback messages stored.

10.18.2 Service Information

While the phone displays the mailbox, it can perform the following actions:

- If the phone goes off hook, the mailbox is canceled and the phone can start to dial (instead of the dial tone the announcement "You have a message" is offered). When the phone goes on hook, the mailbox display is offered.
- The phone can start to dial. The mailbox is canceled and the dialed digits are displayed. After ending the call, the mailbox display is offered.
- A phone which is configured as a keyset can select a line, by pressing the corresponding line key. The mailbox is canceled and the phone can start to dial (instead of the dial tone the announcement "You have a message" is offered). After ending the call, the mailbox display is offered.

- In this state, the phone can receive calls. The mailbox is canceled and the number/name of the caller appears on the display. If the call isn't answered and the caller ends the call, the phone returns to idle and the mailbox display is offered. The phone can also answer this call by going off hook (or by pressing the line key for keysets). After the call is finished and the phone returns to idle, the mailbox display is offered.
- In this state, the user can scroll through the messages ("Next entry?" option), can execute the callbacks ("Call originator?" option), can delete the messages ("Delete?" option) or can leave the mailbox ("Cancel?" option).

The following configurable feature keys (with AMO TAPRO) are supported during the phone displays the mailbox:

- Name key (NAME)
- Speed dial key (SPDI)
- Call-log key (CALLOG). If the call log key is pressed, then the call log will appear on the display. After the call log is canceled, the mailbox display will be offered again.
- Call pickup key (PU). If the phone is configured in a pickup group, then it can pickup the call for a member of the pickup group. The display of the phone will not show for which member of the group the call is (mailbox display will remain on).

10.18.3 Generation (Example)

This feature is activated with a AMO SDAT attribute for each phone in the system. Only the phones marked with this attribute will display the mailbox in idle display.

- Activation:
  `CHA-SDAT:STNO=XXXX,TYPE=ATTRIBUT,AATTR=MBXDSPID;`
- Deactivation:
  `CHA-SDAT:STNO=XXXX,TYPE=ATTRIBUT,DATTR=MBXDSPID;`

  XXXX - is the number of the digital phone.

10.18.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
SDAT	MBXANZRU	d	Mailbox-Anzeige im Ruhezustand
	MBXDSPID	e	Mailbox display in idle state

10.19 Dictation Equipment DICT

- Assign TMOM module
  `AD-BCSU:MTYPE=PER,LTU=number,SLOT=number,PARTNO=string;`
- Assign code for dictation equipment
  `AD-WABE:CD=key-num,DAR=DICT;`

- Add class of trunk
  `AD-COT:PAR=NTON;`
- Add class of parameter
  `AD-COP:PAR=SACK&BR64&LSUP&IDP1;`
- Add trunk group
  `AD-BUEND:NO=number;`
- Add trunk circuit
  `AD-TSCSU:COTNO=number,TGRP=number,DEV=DICT,COPNO=number,`
  `SUPV=SUPV2,ACKT=SZACK2,DTYPE=2;`
- Assign a route to the dictation equipment
  `AD-RICHT:TYPE=CD,CD=key-num,SVC=VCE,TGRP1=number;`

10.20 Digital Station with S0 Interface

Bus configurations can be set up with various devices at the S0 interface (STMD or STHC and STMD2) with PNT-E (SLMO24, SLMOP, STHC, etc.).

Device types

- Functional terminals are operated with the protocols SBDSS1 or SBNIBRI.

You can connect up to three devices with different services and protocols but a single call number to the S0 bus. Only one protocol is permitted per service.

The introduction of MSN call numbers lets you extend the number of call numbers at the S0 bus beyond the above limits (only applies to functional terminals and therefore not to all other types of configuration described below - see also chapter "EURO ISDN Terminals", Section 120.2.1, "Multiple Subscriber Numbers (MSN) on the S0 Bus".

You can configure the following connection options:

- direct
- over PNT E (Private Network Terminator) at the Up0/E or ANSI-U NTBA
- as an "external" extension only at STMD (over public paths)

Configuration types

- Functional Bus (FBUS)
- S0 interface at the UP0/E port (see Chapter 133, "PNT E for Connecting Standardized S0 Telephones").

10.20.1 Functional Bus

You can connect terminals to the functional bus with the SBDSS1 or NIBRI protocol. You can only connect non-voice dial-in devices. You can only configure one call number per bus and one terminal per service (see also the following Note on MSN call numbers).

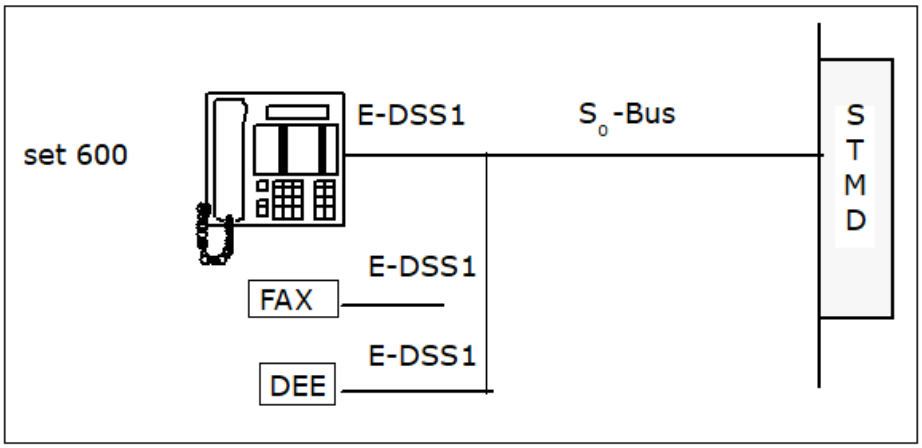


Figure 99: Functional bus (configuration example)

IMPORTANT: The introduction of MSN call numbers lets you reach functional terminals at the main number or at a new call number. You can also connect additional functional terminals for the same services as already configured at the main number to the bus and reach them at a new call number (see also "EURO ISDN Terminals", Section 120.2.1, "Multiple Subscriber Numbers (MSN) on the S0 Bus".

Configure the terminals for this example as follows:

```
ADD-SBCSU:STNO=number,OPT=FBUS,CONN=DIR,
DVCFIG=SET600&FAX&DTE,COS1=number,COS2=number,
LCOSV1=number,LCOSV2=number,LCOSD1=number,
LCOSD2=number,SPROT=SBDSS1,FPROT=SBDSS1,DPROT=SBDSS1;
```

10.20.2 Bus Extenders

10.20.2.1 Adding NV Services to the Functional Bus

The services can only be assigned to a particular call number that already exists for example, functional services with OPT=SVC (the result remains an FBUS).

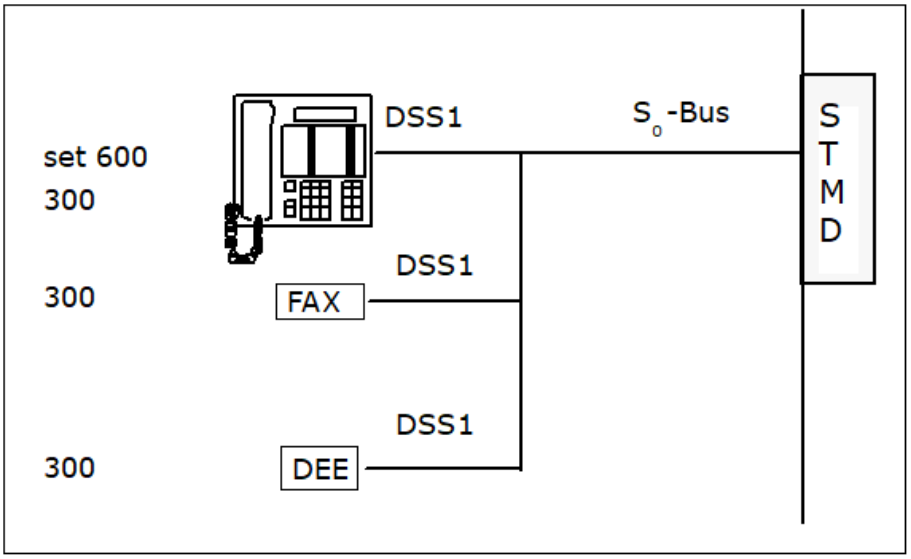


Figure 100: Functional bus (expansion example)

```
ADD-SBCSU:STNO=300,OPT=SVC,DVCFIG=DTE,DPROT=SBDSS1;
```

IMPORTANT: If there are MSN call number configured at the FBUS, the new service is automatically added to their scope of service (see "EURO ISDN Terminals", Section 120.2.1, "Multiple Subscriber Numbers (MSN) on the S0 Bus".

10.20.2.2 Adding MSN Call Numbers to the Functional Bus

The introduction of MSN call numbers lets you reach functional terminals at the main number or at a new call number. You can also connect additional functional terminals for the same services as already configured at the main number to the bus and reach them at the bus's new call number (see also "EURO ISDN Terminals", "Section 120.2.1, "Multiple Subscriber Numbers (MSN) on the S0 Bus").

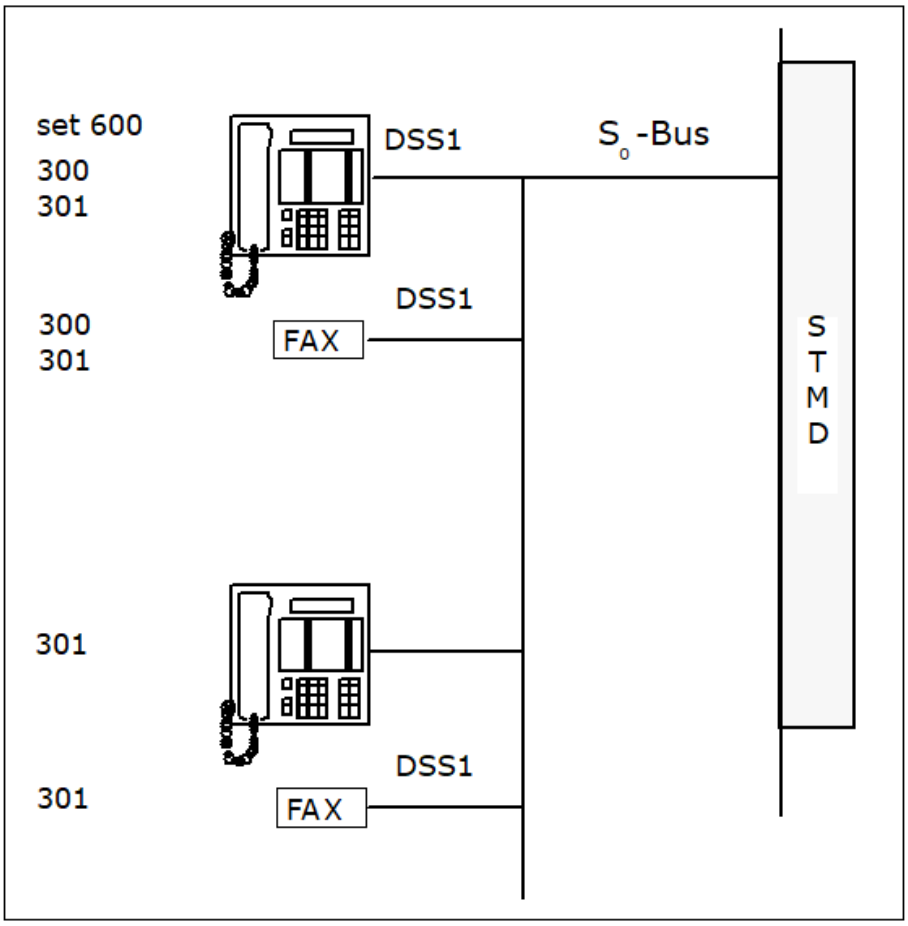


Figure 101: Functional bus with MSN call numbers (expansion example)

Add an MSN call number to the existing functional bus with:
`ADD-SBCSU:STNO=301,OPT=MSN,MAINO=300;`

10.20.2.3 Deleting Devices at the S0

You may only delete the main number of a device last.

- You need one delete job for every call number.
- You can delete individual services for a call number. If there are MSN (extension) numbers configured, the deleted service is automatically removed from their scope of service. If you delete the last functional service at the main number, all MSN (extension) numbers belonging to the bus are automatically deleted.
- To delete the entire bus, create a delete job containing all configured call numbers with SVC=ALL. If there are MSN (extension) numbers configured, you must delete these first with SVC=MSN.
- In general, the conditions that apply to the AMO SCSU also apply to group assignments (for example, call pickup groups, executive/secretary systems, hunt groups, etc.). You must first remove the call numbers to be deleted from the group assignments.
- Existing station/device assignments (created with the AMO TGER) are automatically deleted.

- The device to be deleted can first be deactivated with the AMO DSSU or controlled with the parameter OFFTYPE so that deactivation is performed by the AMO SBCSU.

10.21 Direct Station Selection (DSS)

10.21.1 Feature Description

Devices with Direct Station Selection (DSS) are automatically assigned a memory when configured with the AMO SBCSU. The proportion of name keys to DSS keys may be freely selected per telephone. The difference between DSS and name keys is that on DSS keys, the busy condition of the destination is displayed via a LED. If the destination is called despite being busy, call waiting is automatically activated and the destination is called when no longer busy.

By pressing the flashing DSS key (while the destination is being called), it is possible to take the call.

The DSS key must be assigned to one of the freely programmable keys to be able to make a destination entry. This may be achieved with the AMO TAPRO, either by assigning a standard key layout or by assigning the key function individually.

10.21.2 Service Information

- DSS destinations must be internal stations. Stations within the network are also possible (see Chapter 78, "CHESE/ Team Functions Network-wide").

10.21.3 Generation (Example)

- DSS keys are configured as follows, either with a standard or an individual key layout:

  `CHA-TAPRO:STD=number,KY01=DSS,...;` (standard key layout with DSS keys) `CHA-TAPRO:STNO=number,STD=number,KY01=DSS,...;` (individual key layout)
- A DSS destination is configured as follows:
  `ADD-ZIEL:TYPE=DSS,SRCNO=number,KYNO=number,DESTNOD=number,DEV=param;`

  A special feature is implemented in conjunction with the integrated secretary system. If an executive has his secretary as the destination on a DSS key and the secretary activates the substitute secretary, the destination entry on the executive's phone is automatically assigned to the substitute and is re-assigned to the secretary again when deactivated.
- To prevent DSS-keys modification by user:
  `CHANGE-ZANDE:TYPE=OPTISET,PROTDSS=YES;`

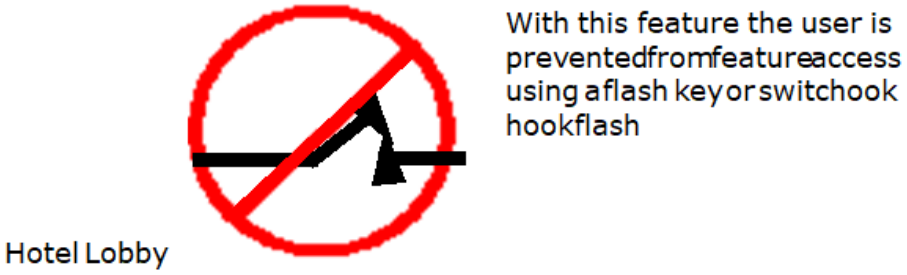
10.21.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
TAPRO	SNU	d	Standardnummer
	STD	e	Map standard
	TD0x	d	Tastenfunktion Taste x (x = Nummer der Taste am EG z.B. 1-19)
	KY0x	e	Key function for button x (x=number of button e.g. 1-19)
	TLNNU	d	Teilnehmer-Rufnummer
	STNO	e	Station number
ZIEL	TYP	d	Verzweigungsparameter DR = Direktruftaste
	TYPE	e	Desired destination option DSS = Direct station selection key
	QLRUFNU	d	Quellen Rufnummer
	SRCNO	e	Station number of source
	TASNU	d	Tastennummer
	KYNO	e	Key number
	DZLRUFNU	d	Zielrufnummer für Direktruf
	DESTNOD	e	Destination number for DSS
ZANDE	TYP	d	OPTISET Eistellungen fuer optiset endgeraete.
	TYPE	e	OPTISET Settings for optiset devices
	PROTDSS	d	Aenderung von Direktruftasten durch Benutzer verhindern. JA/NEIN
	PROTDSS	e	Prevent DSS-keys from being modified by user. YES/NO

10.22 Disable Flash on Analog Phones

10.22.1 Overview

This feature allows the disabling of the hookflash function.



The feature is already available in the U.S.and allows for the administration of "featureless" analog telephones for selected users by ignoring any hookflash signal. Station users in various enviroments such as hospitals, elderly care facilities and some hotels often do not require features to be used, in these cases telephone sets without hookflash keys can be provided,and by administration any hookflash signal from the telephone switchooks can be ignored.

10.22.2 Feature Description

The disable flash on Analog phones feature provides via administration the capability to disable the flash capability from an analog device. This feature includes a new classmark to disable the detection of a hookswitch flash by an analog telephone. When this classmark is assigned via a parameter used for such analog telephones, any attempt by a station user with that authorization to activate a hookswitch flash shall result in one of two states:

- An attempted hookswitch flash of short duration (less than disconnect time) is ignored
- An attempted hookswitch flash of longer duration (greater than disconnect time) results in an on-hook condition

10.22.3 User Interface

The only difference for an Analog phone is the removal of the hookflash capability, therefore all functions that first require a hookflash are disabled (e.g. consultation, transfer).

10.22.4 Service Information

The disable flash on Analog phones feature is intended for the global marketplace.

10.22.5 Generation (Example)

- How to disable the Hookflash on an Analog line
  `CHA-SCSU:STNO=2300,FLASH=NO;`

10.22.6 Relevant AMOs

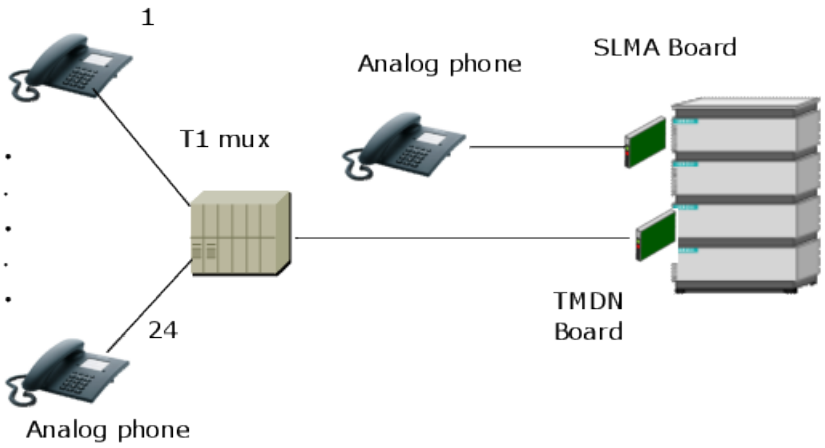
AMO	Parameter	Sprache/ Language	Beschreibung/Description
SCSU	FLASH	d	Bei Einstellung NEIN steht die Hookflash-Funktion auf analogen Telefonen nicht zur Verfügung
	FLASH	e	Set to NO will not allow the Analog device to hookflash

10.23 Disable Message Waiting Lamps on OPS

10.23.1 Overview

OPS Off Premises Station is an application for where there are requirements for an analog telephone to be located an extended distance from the telephone system. Analog telephones can be utilized in exposed areas where the instrument may be open to abuse.

e.g. A large campus environment with guard stations located around the perimeter could utilise OPS analog telephones.



10.23.2 Feature Description

The external interfaces to the Off Premises Station (OPS) shall be T1 interface (TMDN-H) and a line interface (SLMA). Message Waiting Indication via lamp

shall not be supported on an OPS line (port), due to what is deemed to be hazardous voltage requirements.

The introduction of the TMDN board is not covered in this document as it is a separate feature .

10.23.3 User Interface

The user interface for this feature remains the same as the existing Analog devices with the excepion of the MW Lamp.

10.23.4 Service Information

The disable MW Lamps on an OPS feature is intended for the global marketplace.

10.23.5 Generarion (Example)

- How to configure an Anate as an SLMA Off Premise Station (OPS)

  NOTE: Ensure that the DHPAR is NOT set to MWLED
  `CHA-SCSU:STNO=2300,CONN=OPSSLMA;`
- How to configure an Anate as an T1 Off Premise Station (OPS)

  NOTE: Ensure that the DHPAR is NOT set to MWLED
  `CHA-SCSU:STNO=2300,CONN=OPST1;`

10.23.6 Relevant AMOs

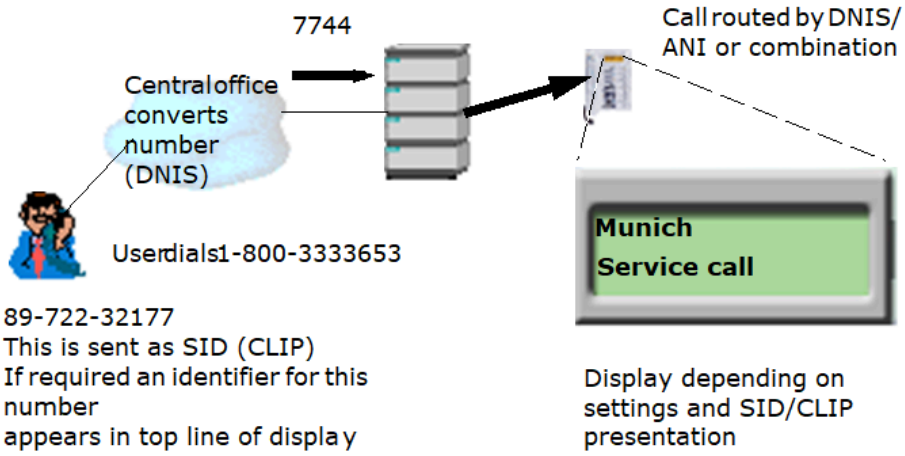
AMO	Parameter	Sprache/ Language	Beschreibung/Description
SCSU	ANSCHL	d	EXTSLMA
	CONN	e	OPSSLMA - The OPS is connected to an SLMA card
SCSU	ANSCHL	d	EXTT1
	CONN	e	OPST1 - The OPS is connected to an T1 (TMDNH) card
SCSU	DHPAR	d	
	DHPAR	e	This should NOT be set to MWLED

10.24 DNIS (Directory Number Identification Services)

IMPORTANT: This document describes only the administration of **D**irectory **N**umber **I**dentification **S**ervices (**DNIS**) services for different configurations.

10.24.1 Overviews

The ability to route calls depending on the called party or calling party has been up to now a feature of flexrouting (ACD) with the I.M switch. The feature is made available based on both source (SID/ANI in the U.S.) routing and destination (DNIS in the U.S.) routing without the need to configure ACD routing in the system.



10.24.2 Feature Description

10.24.2.1 Definition of Tables

Table	Usage
DNI	Directory Number Information table: stores routing and display information concerning source (SID/ANI) and called party (DNIS) digit strings.
GDTR	General Digit Translation table: stores the translation information concerning SID/ANI and non-sequential DNIS numbers.
GDTRSR	General Digit Translation Service Rule table: stores the information concerning the DNIS **GDTRRULE** for Primary Rate Interface trunks.
DIDCR	Direct Inward Dialing (DID) Digit conversion table (AMO DIDCR).

10.24.2.2 Definition of Terms

Term	Definition
DNIS(**D**ialed **N**umber **I**dentification **S**ervice)	This feature allows special call routing and special call displays based on the **original called (dialed) number**.
SID/**ANI**: (**S**tation **Id**entification / **A**utomatic **N**umber **I**dentification)	This Feature allows special call routing and special call displays based on the **calling number**.
ANI	The **A**utomatic **N**umber **I**dentification is a public network customer billing number stored at the public network central office serving the originator of the call. The **ANI** may be delivered when the **SID** number is not available.
SID	The **Station Identification** is the calling party number of the station originating the call.
DIDBLK	Incoming **D**irect **I**nward **D**ialing (**DID**) blocking.

10.24.2.3 AMO Relationships

DNIS digit conversion features requires interaction with the following AMOs:

- AMO TDCSU & AMO TACSU, for Trunks
- AMO BUEND, for Trunk Groups
- AMO DNIT, Directory Numbering Internal Translations
- AMO DIDCR,Direct Inward Dialing Conversion
- AMO WABE, Dialing Plan.

10.24.3 Service Information

This feature is released for the US and international market.

10.24.4 Generation

10.24.4.1 AMO WABE

Define a set of numbers to be in the numbering plan (WABE) and should be reserved for Station Terminations (STN(s)) for the DNIS services

```
ADD-WABE:CD=645000&&645009&&,DAR=STN;
```

10.24.4.2 AMO TDCSU (Digital), AMO TACSU (Analog) Trunk Configuration

With AMo's TDCSU and TACSU it is possible to define whether the incoming trunk information is routed via a DIDCR table , a GDTR table or no table selection, based on trunk and trunk group configuration parameters.

When configuring a digital trunk with AMO-TDCSU for ISDN-PRI or Cornet-NQ trunks the new parameter TRTBL is used to select DIDCR or GDTR digit conversion tables.

SIDANI= YES forces SID/ANI additional signalling to obtain the Called Party (ANI) or Billing Party Information (SID/BN) if not presented in original Call Setup message. If SID/ANI is required and not send by incoming side the call will be released.

TGRP field is indirectly related for this feature to determine GDTR Table rule index in the later stages of DNIS processing.

Digital Trunk configuration using AMO-TDCSU:

```
ADD-TDCSU:OPT=NEW,PEN=1-2-85-
0,COTNO=20,COPNO=20,DPLN=0,ITR=0,COS=1,LCOSV=1,LCOSD=1,CCT="NQ
TEST",PROTVAR=ECMAV2,SEGMENT=8,TRTBL=GDTR,SIDANI=N,ATNTYP=TIE,DE
V=S2CONN,BCHAN=1&&30,BCGR=1,TGRP=96;
```

This configuration forces GDTR conversion with no SID/ANI requirement with using TGRP=96 for a Cornet-NQ trunk.

Analog trunk configuration using AMO-TACSU with TRTBL,RULEIDX, TGRP (Example only)

```
ADD-TACSU:PEN=1- 1-121-
0,COTNO=240,COPNO=240,DPLN=0,ITR=0,COS=220,LCOSV=1,LCOSD=1,TGRP=
240,TRTBL=DID,RULEIDX=6,DEVTYPE=TT,DEV=TSEMCON;
```

This configuration uses DIDCR conversion table 6. AMO-BUEND GDTRRULE has no effect.

10.24.4.3 AMO BUEND

Example to show GDTR rule

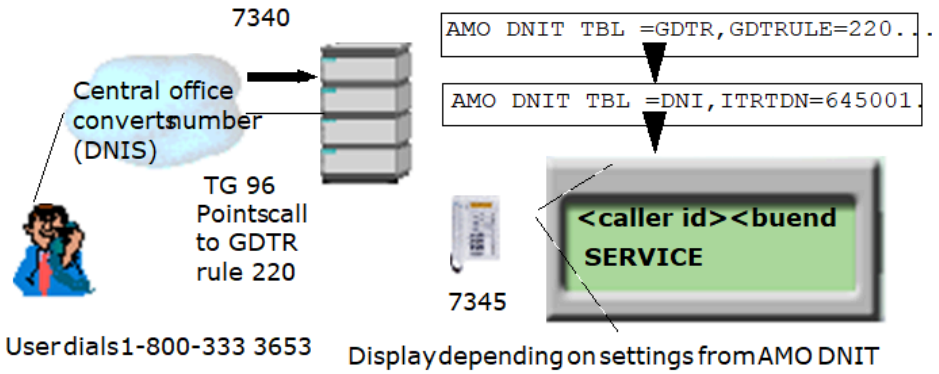
Create Trunk Group (AMO BUEND):

```
ADD-BUEND:TGRP=96,NAME="DNIS 1",NO=30,RSV=N,TRACENO=0,

ACDTHRH=*,PRIONO=2,TDDRFLAG=ON, GDTRRULE=220,ACDPMGRP=0;
```

This trunk group will use GDTR table 220.

10.24.4.4 GDTR Conversion for only Called Party Number

Create DNIS Routing with DRTD (with/without ACD) for GDTRRULE 220. This would create a digit conversion based on Called Party Number only. SID/ANI information would have NO effect of termination point selection



Example

Callers who route into the system via Trunk Group 96 with digits 7340 are routed to internal number 7345 with the second line of the display showing "Service".

- Add the routing and display parameters for internal rerouting number 645001
  ```
  ADD-
  DNIT:TBL=DNI,INTRTDN=645001,ROUTING=DRTD,DISPLAY="SERVICE",
  ACD=N,TARGET=7345;
  ```
- Add Digit patterns which will be routed to Internal Director Number (INTDN) 645001
  ```
  ADD-
  DNIT:TBL=GDTR,GDTRRULE=220,DGTSTR=7340,INTRDN=645001,SVCDATA=
  NOREQU;
  ```
  This provides a digit conversion based on GDTR tables with Called Party number of 7340 to terminate to STNO=7345 for any incoming call from trunk group attached to GDTR rule 220. Also DNIS display defined with DISPLAY field to be presented to termination on display line 2
- To allow for all other digit patterns to terminate on station 7344 additional entries are made in the GDTRRULE 220 and a DNI entry in AMO DNIT
  ```
  ADD-
  DNIT:TBL=DNI,INTRTDN=645002,ROUTING=DRTD,DISPLAY="NORMAL
  SERVICE", ACD=N,TARGET=7344;
  ```
- Add Digit patterns which will be routed to Internal Director Number (INTDN) 645002
  ```
  ADD-
  DNIT:TBL=GDTR,GDTRRULE=220,DGTSTR=#,INTRDN=645002,SVCDATA=NOR
  EQU;
  ```
  This provides a digit conversion based on GDTR tables with digit pattern of any number(# means any number presented as called party number)to terminate to STNO=7344 for any incoming call from trunk group attached

to GDTR rule 220. Also DNIS display defined with DISPLAY field to be presented to termination on display line 2

Any SID/ANI/Clip information proivided would be presented in line 1 of the display together withthe trunk group name if set to do so. (AMO ZAND,ALLDATA2 parameter DISPTGNA)

Note this is not using ACD to route the call as specified by ACD= N in AMO DNIT.

To enable the display parameter text to appear on the display of the telephone the following parameter is required in AMO SBCSU
`CHANGE-SBCSU:STNO=7340,OPT=OPTI,DNIDSP=YES;`

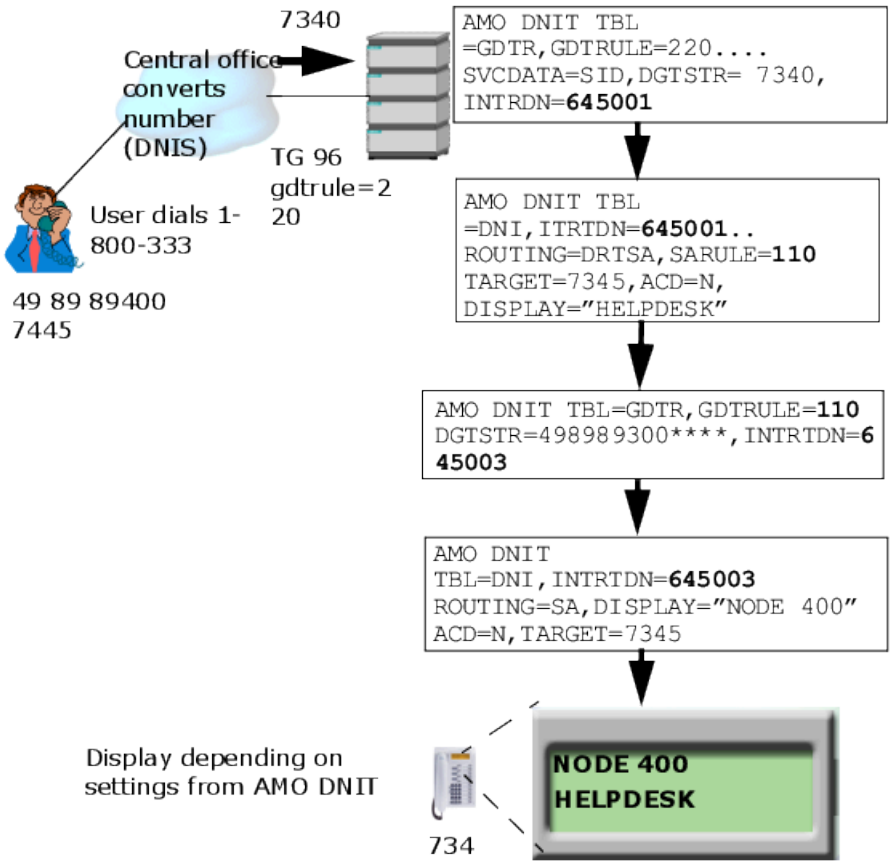
IMPORTANT: There is a fixed relationship between the GDTR rule and the type of routing. GDTR rules 129 and above are used for DNIS routing. Here the DGTSTR parameter is the CALLED party number and the wildcard # represents any CALLED party number. With GDTR rules used for SID /ANI routing (1-128) the parameter DGTSTR represents the CALLING party number. The wild card ***** can be used to represent any **calling party digit** and the **#** character represents any **calling party number**.

The use of the wild card # in the DNIT table for called party number (GDTR rule 129 and above) can lead to the complete DDI range being routed by GDTR rules. If this is not required and only specific numbers within a DDI range are to be routed by GDTR then omit the wildcard # entry in the DGTSTR parameter. With this setting only those numbers matching entries in DGTSTR will be further processed all other DDI numbers will route as normal.

10.24.4.5 GDTR Conversion for Called Part Number and SID/ANI info

Here the incoming call is routed by the dialled number (DNIS) but with additional routing and display information depending on the calling party number.

This example defines Called party Number conversion then possibly additional conversion for SID/ANI



In the example above any caller with the caller ID of 498989400xxxx will be routed to station 7345 and will present 2 lines in the display ,line 1 being the display of a known caller

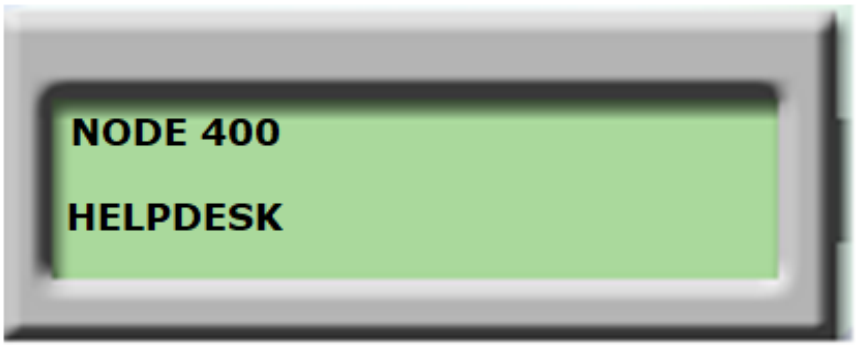
- Set rule number in BUEND to connect Rule to Trunk and Trunk Group
  `CHA-BUEND:GDTRRULE=220,TGRP=96;`
- Add the routing and display information for a known caller
  `ADD-DNIT:TBL=DNI,INTRTDN=645003,ROUTING=SA, DISPLAY="NODE 400",ACD=N,TARGET=7345;`
- Add the rule to verify any caller from 498989400
  `ADD-DNIT:TBL=GDTR,GDTRRULE=110,DGTSTR=498989400****, INTRTDN=645003,SVCDATA=NOREQU;`

  `ADD-DNIT:TBL=DNI,INTRTDN=645002,ROUTING=DRTSA, DISPLAY="HELPDESK ",ACD=N,TARGET=7345,SARULE=110;`

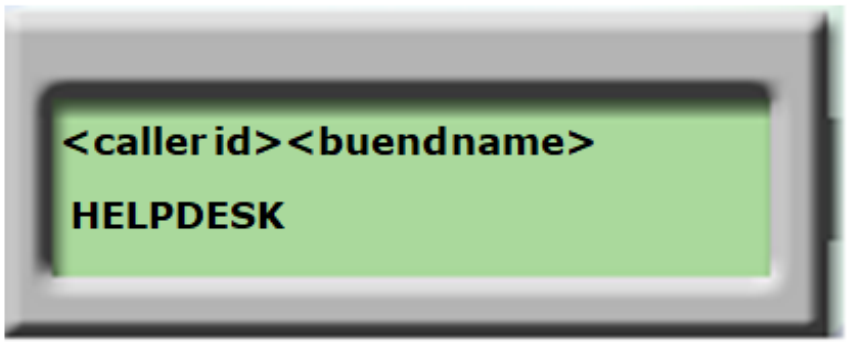
  `ADD-DNIT:TBL=GDTR,GDTRRULE=220,DGTSTR=7340,`

```
INTRDN=645002,SVCDATA=SID;
```

This should provide a digit conversion based on GDTR tables with digit pattern 7340 to terminate to STNO=7345 and if SID/ANI /CLIP information matches 110 the station will receive the display:



or if SID/ ANI/ CLIP information DOES NOT match rule 110 the display is:



In this example there is a digit conversion for the called party number.

It is possible to only alter the routing dependent on the SID /ANI / CLIP information i.e the Calling Party Number

This requires an entry of a GDTR rule for DNIS routing (129 and above) as a trunk group cannot be pointed to a GDTR table used for SID/ANI routing (1-128) in this case a Wild card could be required for the DNIS entry (#) to allow for any dialled digits.

IMPORTANT: The use of digit stings with wild card entries e.g # can be considered. As calls are pointed to the DNIT table from the trunk group there is a possibility several different digit strings are received as Called Party Number. If normal DDI is required then the # should be omitted and a separate entry in DNIT is required for specific called party numbers.

10.24.4.6 DNIT table GDTRSR

In the previous examples the GDTR rule has been selected by the **GDTRRULE** parameter in AMO BUEND. In practice this restricts the changes to the routing as this parameter can only be changed if the trunk group is empty. The normal

practice is to define in AMO DNIT a **GDTRRULE** depending on the trunk group and the type of service used.

There exists in AMO DNIT a table, the GDTRSR table, here it is defined per service and per trunk group which **GDTRRULE** is to be used.

Example

Callers who route into the system via Trunk Group 96 (ISDN) with digits 7340 are routed to internal number 7345 with the second line of the display showing "Service".

- Add the trunk group for the ISDN trunk
  ```
  ADD-BUEND:TGRP=96,NAME="DNIS
  1",NO=30,RSV=N,TRACENO=0,ACDTHRH=*,
   PRIONO=2,TDDRFLAG=ON,
  GDTRRULE=0,ACDPMGRP=0;
  ```
- Change the GDTRSR table entry for trunk group 96 and service NONE (ISDN)
  ```
  CHANGE-DNIT:TBL=GDTRSR,TGRP=96,DNISRULE=220,NETSVC=NONE;
  ```
- Add the routing and display parameters for internal rerouting number 645001
  ```
  ADD-
  DNIT:TBL=DNI,INTRTDN=645001,ROUTING=DRTD,DISPLAY="SERVICE",
  ACD=N,TARGET=7345;
  ```
- Add Digit patterns which will be routed to Internal Director Number (INTDN) 645001
  ```
  ADD-
  DNIT:TBL=GDTR,GDTRRULE=220,DGTSTR=7340,INTRDN=645001,SVCDATA=
  NOREQU;
  ```
  This provides a digit conversion based on GDTR tables with Called Party number of 7340 to terminate to STNO=7345 for any incoming call from trunk group attached to GDTR rule 220. Also DNIS display defined with DISPLAY field to be presented to termination on display line 2
- To allow for all other digit patterns to terminate on station 7344 additional entries are made in the GDTRRULE 220 and a DNI entry in AMO DNIT
  ```
  ADD-
  DNIT:TBL=DNI,INTRTDN=645002,ROUTING=DRTD,DISPLAY="NORMAL
  SERVICE", ACD=N,TARGET=7344;
  ```
- Add Digit patterns which will be routed to Internal Director Number (INTDN) 645002
  ```
  ADD-
  DNIT:TBL=GDTR,GDTRRULE=220,DGTSTR=#,INTRDN=645002,SVCDATA=NOR
  EQU;
  ```

10.24.4.7 GDTR Digit Conversion (DNIS) without SID/ANI signalling without PRI services

Add TMDN-H card as PRI trunk for USA, trunk group (BUEND) 96 with GDTRRULE =0

- PRI TMDN-H Card configuration:
  ```
  ADD-BCSU:PER,1,1,67,"Q2196-X   ",1,"0",,,,,,A;
  ```
- Trunk Group Configuration:
  ```
  ADD-BUEND:96,"PRI BOCA RATON
  DNIS",60,N,0,*,2,ON,GDTRRULE=0,0;
  ```

- Set trunk group 96 to route to GDTRRULE 220 for service NONE
  `CHANGE-DNIT:TBL=GDTRSR,TGRP=96,DNISRULE=220,NETSVC=NONE;`
- Trunk Configuration:(Example only)

  Functional Fields to note: PROTVAR, TRTBL, SIDANI

  ```
  ADD-TDCSU:OPT=NEW,PEN=1-02-031-0,COT=99,COP=99,COS=1,
  LCOSV=9,LCOSD=9,CCT="PRI-DNIS",PROTVAR=ATT4ESS ,
  SEGMENT=1,TRTBL=GDTR,SIDANI=N ,NNO=1-1-99,TGRP=96,
  SRCHMODE=CIR,DEV=S2COD,BCHAN=1&&10,BCNEG=N,BCGR=1,
  LWPAR=2;
  ```
- Create DNIS Routing with DRTD without ACD for GDTRRULE 220

  ```
  ADD-DNIT:TBL=DNI,INTRTDN=645003,ROUTING=DRTD,
  DISPLAY="MC DONALD'S",ACD=N,TARGET=7345;

  ADD-DNIT:TBL=DNI,INTRTDN=645002,ROUTING=DRTD,
  DISPLAY="BIG MACS",ACD=N,TARGET=7344;
  ```
- Add Digit patterns which will be routed to Internal Director Number (INTDN) 645002&645003

  ```
  ADD-DNIT:TBL=GDTR,GDTRRULE=220,DGTSTR=7710,
  INTRDN=645002,SVCDATA=NOREQU;

  ADD-DNIT:TBL=GDTR,GDTRRULE=220,DGTSTR=771*,
  645003,SVCDATA=SID;
  ```

  This can provide a digit conversion based on GDTR tables with digit pattern 7340 to terminate to STNO=7345 and digit patterns "7711-7719" to terminate STNO 7344 for any incoming call from trunk group attached to GDTR rule 220. Also DNIS display defined with DISPLAY field to be presented to terminating side.

10.24.4.8 GDTR Digit Conversion (DNIS) with SID/ANI signalling without PRI-Services for USA-PRI Trunks.

Configuration of trunk and trunk group parameters are as above

Configure DNIT routing and display for known caller

```
ADD-DNIT:TBL=DNI,INTRTDN=645005,ROUTING=SA,
DISPLAY="MAJOR CUSTOMER",ACD=N,TARGET=7345;
```

Configure SA rule to verify a known caller

```
ADD-DNIT:TBL=GDTR,GDTRRULE=110,DGTSTR=5619231687,
INTRTDN=645005,SVCDATA=NOREQU;
```

- Configure the DNI table entry and link to sa rule 110

  ```
  ADD-DNIT:TBL=DNI,INTRTDN=645002,ROUTING=DRTSA,
  DISPLAY="SALES ORDER",ACD=N,TARGET=7345,SARULE=110;
  ```
- Configure the GDTR rule 220 to allow any dialled digits

  ```
  ADD-DNIT:TBL=GDTR,GDTRRULE=220,DGTSTR=#,
  INTRDN=645002,SVCDATA=SID
  ```

10.24.4.9 GDTR Digit Conversion (DNIS) with SID/ANI signalling with PRI Services for USA-PRI Trunks for ACD call.

The ACD Configuration is not shown here. the decision to route to an ACD group is made with the parameter ACD = Y/ N . The AMO DNIT branch changes depending on the selection

- Create DNIS routing with SID/ANI as DNIT entry for known customer display information on line 1 of the display to route to routing control group 100

  ```
  ADD-DNIT:TBL=DNI,INTRDN=645004, ROUTING=SA,
  DISPLAY="LINE 1", ACD=Y, RCG=100, PRI=10,
  OVRPRI=1, AUDSRCID=3, THRSHLD=20;
  ```

- Create GDTR SID/ANI Rule 112 to veryfy caller from 5619231687

  ```
  ADD-DNIT:TBL=GDTR,GDTRRULE=112,DGTSTR=5619231687,
  INTRTDN=645004;

  ADD-DNIT:TBL=DNI, INTRTDN=645003, ROUTING=DRTSA,
  SARULE=112, DISPLAY="LINE 2", ACD=Y, RCG=100;
  ```

- Create GDTR Rule 212 For USA PRI Megacom-800 Services () using trunk group # 96

  ```
  ADD-DNIT:TBL=GDTR,GDTRRULE=212,DGTSTR=561800000,
  INTRTDN=645003,SVCDATA=SIDPREF;

  CHA-DNIT:TBL=GDTRSR,TGRP=85,DNISRULE=212,NETSVC=INWATS;
  ```

  This configuration will do digit conversion for INWATSVirtual Connections when digit string 561800000 as called party information is received with calling party number 5619231687 the call will route to RCG 100

  If calls are not INWATS then they will follow the CALLED Party routing

10.24.4.10 GDTR Digit Conversion for Cornet-NQ PRI Trunks.

There is no special configuration in TDCSU except always set SIDANI=NO. Cornet-NQ always provides calling party information in call setup message. US PRI configuration is applicable as defined in previous sections.

Note: Although there is no SID/ANI signalling necessary for Cornet-NQ and SID/ ANI information exists in call setup message, SID/ANI conversion is applicable. to Cornet-NQ too

10.24.4.11 Without DNIS feature configuration

If no digit conversion to be configured (neither DID nor GDTR)

1) For digital trunks analog trunks

For digital trunks - AMO-TDCSU - TRTBL=GDTR,SIDANI=NO;

For analog trunks - AMO-TACSU - TRTBL=GDTR,RULEIDX=0

- Trunk Group (BUEND) - For analog and digital trunks
  `AMO-BUEND GDTRRULE=0;`

- Set GDTRSR table entry for all services to 0
  ```
  CHANGE-DNIT:TBL=GDTRSR,TGRP=96,DNISRULE=0;
  ```

10.24.4.12 DIDCR Digit Conversion without services for analog trunks.

Note: No SID/ANI signalling required for analog trunks.

- Create the DIDCR Table - 1 with total digits 5 delete digits 3. This provides last two digits to be used to determine the final destination.
  ```
  ADD-DIDCR:1,5,3;
  ```
- Add conversions based on last 2 digits to DIDCR Table-1

  ```
  CHA-DIDCR:DID,1,87,61097;

  CHA-DIDCR:DID,1,88,61098;

  CHA-DIDCR:DID,1,89,61099;

  CHA-DIDCR:DID,1,97,71097;

  CHA-DIDCR:DID,1,98,71098;

  CHA-DIDCR:DID,1,99,71099;
  ```

  This provides a numbering conversion of ddd87 -> 61097, .. , ddd99->71099 etc.
- Assign Analog Trunk for DID conversion Table - 1.

  ```
  CHA-TACSU:PEN=1-1-121-0,TRTBL=DID,RULEIDX=1;
  ```

  This provides all calls with 5 digits to be truncated to the last two digits from the look up table-1, Last Two Digit indexes 87,88,89,97,98,99 will be routed to destinations defined above and rest of the calls will keep original dialed numbers to route the call.

10.24.4.13 DIDCR Digit Conversion with SID/ANI signalling with Trunking Services for USA-T1 Trunks.

- Create 1st DIDCR conversion table

  Table-1 Total Digits=6 Delete Digits=4
  ```
  ADD-DIDCR:1,6,4;
  ```
- Add digit conversion based on last 2 digits

  ```
  CHA-DIDCR:DID,1,87,61097;

  CHA-DIDCR:DID,1,88,61098;

  CHA-DIDCR:DID,1,89,61099;

  CHA-DIDCR:DID,1,97,71097;

  CHA-DIDCR:DID,1,98,71098;
  ```

```
CHA-DIDCR:DID,1,99,71099;
```

- Set 2nd DIDCR Table Total Digits=6 Delete Digits=4
  ```
  ADD-DIDCR:2,6,4;
  ```
- Add conversions based on last 2 digits

  ```
  CHA-DIDCR:DID,2,87,61197;

  CHA-DIDCR:DID,2,88,61198;

  CHA-DIDCR:DID,2,89,61199;

  CHA-DIDCR:DID,2,97,71197;

  CHA-DIDCR:DID,2,98,71198;

  CHA-DIDCR:DID,2,99,71199;
  ```
- Attach DID Table 1,2 to service types FX (foreign exchange),VPN (Virtual Private Numbering)

  ```
  CHA-DIDCR:SRT,1,FX,1

  CHA-DIDCR:SRT,1,VPN,2;
  ```
- Assign T1 Trunk for DID conversion service rule Table - 1.

  ```
  ADD-TDCSU: PEN=x-x-x-x,TRTBL=DIDCR, SRTIDX=1,
  SIDANI= Y, DEDSVC=FX,

  ADD-TDCSU: PEN=y-y-y-y,TRTBL=DIDCR, SRTIDX=1,
  SIDANI= Y, DEDSVC=VPN,
  ```

  After this configuration PEN=x-x-x-x will use DIDCR Table -1 for all Foreign Exchange Services and PEN=y-y-y-y trunk will use DIDCR Table-2 for all VPN services.

10.24.4.14 DID call blocking DIDBLK

This feature will disable incoming calls to the stations if the station DID blocking feature is active.

- Change station Class of services (COS) with Add Voice Feature of DIDBLK
  ```
  CHA-COSSU:COS,23,,,,,,AVCE=DIDBLK;
  ```

  This will activate DID Blocking on this station.

10.24.4.15 Call Routing when no CLI present

Feature Description

Routing of an incoming call depending on the calling party number requires an entry of a GDTR rule for DNIS routing.

With GDTR rules used for SID /ANI routing (rules 1-128) the parameter DGTSTR represents the CALLING party number. The wild card * can be used to represent any calling party digit and the # character represents any calling party number.

Generation

For the following configuration, an incoming call to **8887** with caller ID of **498989400xxxx** will be routed to **RCG 103**.

```
ADD-DNIT:TBL=DNI,INTRTDN=8884,ROUTING=SA,SARULE=0,
DISPLAY="NODE 400",ACD=YES,RCG=103,PRI=64,
OVRPRI=0,AUDSRCID=0,THRSHLD=*,REVCHA=FORB;

ADD-DNIT:TBL=GDTR,GDTRRULE=110,DGTSTR=498989400****,
INTRTDN=8884,SVCDATA=NOREQ;

ADD-DNIT:TBL=DNI,INTRTDN=8887,ROUTING=DRTSA,
SARULE=110,DISPLAY="SERVICE",ACD=YES,RCG=23,
PRI=64,OVRPRI=0,AUDSRCID=0,THRSHLD=*,REVCHA=FORB;
```

Additionally it is possible to configure a GDTR entry in order to route incoming calls without caller ID to a group of extensions defined by the customer. **000000** is defined now as the **"no CLI"** string for **DGTSTR** parameter in `ADD-DNIT:TBL=GDTR...`.

```
ADD-DNIT:TBL=DNI,INTRTDN=8884,ROUTING=SA,SARULE=0,
DISPLAY="NO CLI",ACD=YES,RCG=103,PRI=64,
OVRPRI=0,AUDSRCID=0,THRSHLD=*,REVCHA=FORB;

ADD-DNIT:TBL=GDTR,GDTRRULE=110,DGTSTR=000000,
INTRTDN=8884,SVCDATA=NOREQ;

ADD-DNIT:TBL=DNI,INTRTDN=8887,ROUTING=DRTSA,
SARULE=110,DISPLAY="SERVICE",ACD=YES,RCG=23,PRI=64,
OVRPRI=0,AUDSRCID=0,THRSHLD=*,REVCHA=FORB;
```

For the above configuration, any incoming call to **8887** with no caller ID will be routed to **RCG 103**.

10.24.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COSSU	ESBER	d	DUWAV-Durchwahlverhinderung
	AVCE	e	DIDBLK -Voice Feature DID Blocking
DNIT	ACD	d	ACD (Automatische Anrufverteilung) verwenden
	ACD	e	ACD line selection Yes or No...
	TAB= DNI GDTR GDTRSR	d	DNI Tabelle fuer Internes Routing GDTR Tabelle fuer Allgemeine Zeichenumsetzung GDTRS Allgemeine Zeichenumsetzung Dienstregel

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	TAB= DNI GDTR GDTRSR	e	DNI Table Type: Directory number information table General digit translation table General digit translation service ruleTable type
	REGEL	d	DNIS- bzw. SID/ANI-Zeichenkette, die mit den Ziffern der gerufenen bzw. rufenden Nummer zu vergleichen ist (Musterabgleich)
	DGTSTR	e	DNIS or SID/ANI digit string to compare (pattern match)(for dialed or calling party digits.
	ANZEIGE	d	Anzeigetext (gerufenes endgeraet)
	DISPLAY	e	DNIS or SID/ANI Pre defined text string to be presented to Called or Calling party for the call
	DNISRGL	d	Nummer des Regeltabelleneintrags
	DNISRULE	e	DNIS Rule index 0 - Not assigned 129-255 DNIS Applicable Rule
	INTRTADR	d	Interne Routing Adresse
	INTRTDN	e	Internal routing directory number
	ROUTING= DRTD DRTSA SA	d	Routingtyp: DNIS-Eintrag, DNIS-abhängiges Routing / Zielnummer DNIS-Eintrag, SIDANI-abhängiges Routing + Zielnummer Ursprungsabhängiges Routing (SID/ ANI-Eintrag)
	ROUTING= DRTD DRTSA SA	e	Routing Type: DNIS entry routing on dnis - Dialed Party Number DNIS entry routing on sidani + With Dialed Number Source Number routing (SID/ANI entry)
	SARGL	d	Nummer der SID/ANI Regel
	SARULE	e	SID/ANI Conversion Rule 1-128...

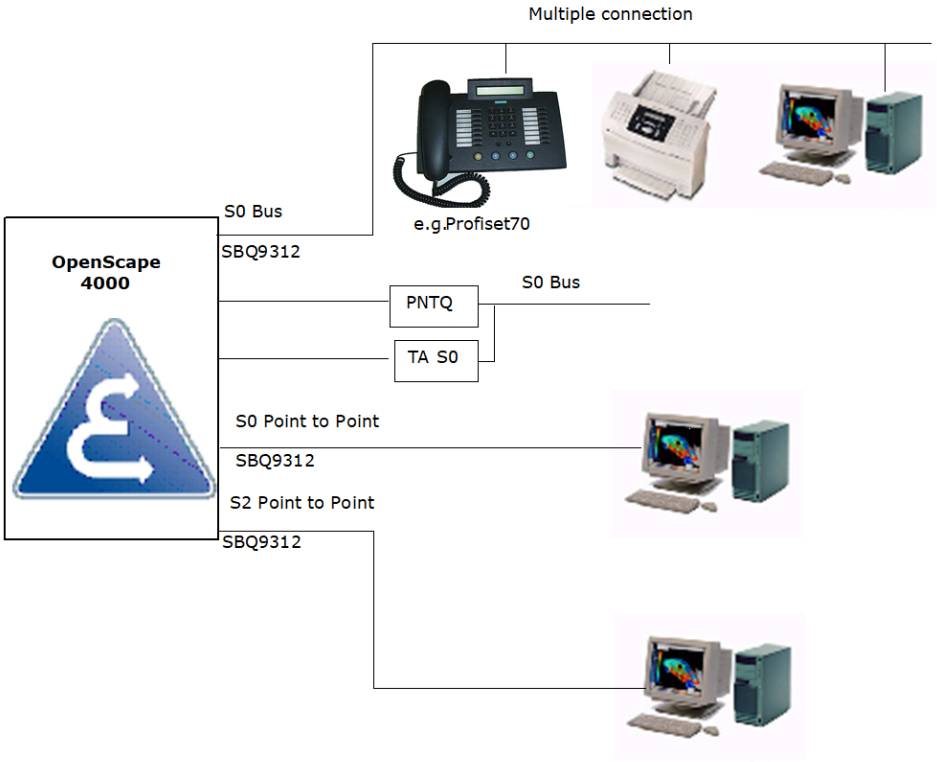
AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	NETSVC=: FX INTLWATS INWATS LDS NONE PPC900 SDS TTA VPN	d	Netzdienst Fremdvermittlungszugang Internationale Langstrecke Megacom/mci 800, WATS eingehend Langstreckendienst Kein Dienst ausgewählt Multiquest, mci 900 Sds Accu-net Zugang Querverbindungsleitung, SDN, Mci Vnet, Private NW-Dienste.
	NETSVC=: FX INTLWATS INWATS LDS NONE PPC900 SDS TTA VPN	e	Network Service Foreign Exchange Access Service International Long Distance Megacom/mci 800,incoming Wats Long Distance Service No Service Selected Multiquest, Mci 900 Sds Accu-net Tie Trunk Access Sdn, Mci Vnet, Private Nw Services.
	SVCDATA:= ANI ANIPREF NOREQU SID SIDPREF	d	SID/ANI-Voreinstellung Nur ANI ANI voreingestellt SID/ANI nicht angefordert Nur SID SID voreingestellt
	SVCDATA:= ANI ANIPREF NOREQU SID SIDPREF	e	SID/ANI Preference ANI service only ANI service preferred No service request for sid/ani SID service only SID service is preferredservice only
TDCSU	SIDANI	d	SID/ANI Service erlaubt

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	SIDANII	e	SID/ANI Signalling requested per device...
TDCSU	TRTBL= GDTR DIDCR	d	Typ der Zeichenumsetzungstabelle: Tabelle für allgemeine Zeichenumsetzung Tabelle für Umwandlung bei Durchwahl
	TRTBL=: GDTR DIDCR	e	Digit Conversion Table Type: General Digit Translation Table Direct Inward Dialing Conversion Table
TACSU	RULEIDX	d	DID Regelindex
	RULEIDX	e	DNIS Rule index
	TRTBL= GDTR DID	d	Typ der Zeichenumsetzungstabelle: Tabelle für allgemeine Zeichenumsetzung Tabelle für Umwandlung bei Durchwahl
	TRTBL=: GDTR DID	e	Digit Conversion Table Type: General Digit Translation Table Direct Invard Dialing Conversion Table
BUEND	GDTRRGL	d	Regelnummer für Zeichenumsetzung
	GDTRRULE	e	Rule Number for Digit Conversion
SBCSU	DNIDSP	d	Anzeige DNIS info fuer ankommende Gespraeche
	DNIDSP		Display DNIS information for incomming calls
WABE	RNR= KZP=		Rufnummer z.B. 45999&&45600 TLN-Teilnehmer
	CD DAR	e	Called Digits i.e. 45600&&45999, STN- Station

10.25 DSS 1 Terminals

10.25.1 Feature Description

Any terminals available on the open market can be connected to the PBX. All DSS1 functions are guaranteed.



The features are activated via the Supplementary Services instead of codes, provided the terminal offers the required features.

DSS1 stations in bus configuration must be configured identically for all services. Generally, the option table 10 should be assigned to the service protocols.

Supported Features

COS	DSS1 LM	Default	Comment
MSN	MSN	set	Multiple Subscriber Number; only with functional stations
SPECAR	CLIP/ COLP		only activated, if the configured station number is not to be checked.
SUBCAL	SUB		using subaddressing, the station number of the calling party is signalled at the called party.
SUBDB	SUB		using subaddressing, the own station number is signalled at the called party
SUBMSN	SUB		using subaddressing, the MSN is signalled at the called party

COS	DSS1 LM	Default	Comment
UUS1IM	UUS	set	authorization to use the UUS1 implicit service
UUS3	UUS		authorization to use the UUS3 service
CDRATN CDRSTN	AOC ,CDRINT		With activated CDR the option table can be used to set whether AOC-D and AOC-E or only AOC-E is released.
OVCAT	COLR		even if the station number of the called party is secret it is displayed at the station.
COLR		set	the called party has the COS to temporarily suppress the display of the own station number at the calling party (station controlled)
	CFU CFNR CFB CD		"Immediate call forwarding of all incoming calls" switches all incoming calls to a station defined by the user.
			"Call forwarding on no response" switches an incoming call to a station defined by the user, if the user does not answer the call within a certain timer period.
			"Call forwarding on busy" switches an incoming call to a station defined by the user, if the user is busy.
			"Call forwarding by the user" allows the optional manual forwarding of a call. This feature is not supported by HiPatn 4000.
	ECT		"Call transfer" allows a user with a held and an active connection to connect those two parties.
CW	CW	set	the called party has the COS for Call Waiting
	HOLD		"Hold" allows a user to put a call on hold and to resume the call later. During "Hold" the user can establish another call or answer an incoming call.
CCBS	CCBS	set	a calling party meeting a busy station can activate functional callback; IMPORTANT: Bit 5 of byte 3 must be set in the option table.
TRACE MCIDA	MCID		this COS must be set together with MCIDM to allow the automatic registration of all incoming calls. Additional manual registration is not possible.
			automatic registration of nuisance callers; they are calling users who release the line before the connection is established.

COS	DSS1 LM	Default	Comment
TP	TP	set	a user in active talk state can park a call for a maximum of 2 minutes.

In order to be able to use the above Supplementary Services, the DSS1 terminal must be configured in such a way that it can handle more than one signaling connection simultaneously (Class of service parameter: "MULTRA"=Multitransaction).

10.25.2 User Interface

The features are activated independent from the HiPatn 4000 codes by standard protocol elements which are transmitted from the station to the HiPatn 4000. This results on varying user interfaces depending on the station used.

10.25.2.1 Call Forwarding (CFU, CFB, CFNR, and CD)

Two different methods for call forwarding will be implemented for stations using DSS1:

- forwarding using the existing HiPatn 4000 concept (FWD, FWDBSY and FNAN) if FWD is programmed via keypad. The forwarding (FWD or BUL) is then carried out on the A side, which corresponds to the procedure known from HiPatn 4000 system terminals and terminals using 1TR6/D channel signaling protocols.
- forwarding according to DSS1 protocol (CFU, CFB, CFNR and CD) if FWD is programmed functionally. Forwarding is then carried out on the B side.

The old and new forwarding methods are mutually exclusive. If forwarding is programmed using one of the two methods and a forwarding destination has been programmed using the other forwarding method, the latter forwardings are all deleted.

If a forwarding destination is programmed according to both the HiPatn 4000 concept and the DSS1 concept, then, due to data inconsistencies, the HiPatn 4000 concept dominates.

10.25.2.1.1 Differences to previous forwardings (general)

- The terminal can initiate programming for several destination numbers and/or services.
- The A station number must be checked during programming (transmitted by the terminal in the request!).
- The terminal performs a status inquiry, also for several terminals.
- Automatic status transmission to the terminal reporting a programmed call forwarding for every outgoing call.
- Both the data of the first forwarding party and of the last forwarding party must be transmitted in the message when the destination is seized.
- A customer wants the last forwarding party displayed on the terminal (terminal function). The called party number is displayed on system terminals.

10.25.2.1.2 Call Forward Unconditional (CFU)

Differences to the previous FWD with HiPatn 4000

- Execution at station B. For the calling party, B has not activated FWD and is seized.

10.25.2.1.3 Call Forward Busy (CFB)

Differences to the previous FWDBSY with HiPatn 4000

- Execution at station B (initiated by message from the terminal). For the CP, the station is idle (presently as well, if MULTRA is set), and must be seized.
- Up to five forwardings must be possible.

10.25.2.1.4 Call Forward No Reply (CFNR)

Differences to the previous FNAN with HiPatn 4000.

- Up to five forwardings must be possible.
- CFNR cannot be used as FNAN in a hunting group. Terminals supporting CFNR according to DSS1 protocol can therefore not be used in hunting groups.

10.25.2.2 Call on Hold

- A station can put a call on hold, without initiating consultation call, with the following consequences:
- after placing a call on hold, the station can pick-up an incoming call instead of initiating a consultation call.
- Consultation call of a DSS 1 terminal is evaluated as a normal basic call (CPS station prefix)
- A consultation call on a DSS1 terminal cannot be picked up, only transferred using ECT.
- The demand that the held party can also hold a connection results in the following:
  - transfer by release is no longer possible.
  - Station transfer security is not longer possible (automatic recall on no answer using ECT is still supported).

10.25.2.3 Call Transfer (ECT)

- The information about the call transfer type is no longer connection-related but station-related (status of the new partner) which could result in differing messages at the stations (TRANSFER_TALKING and TRANSFER_RINGING).
- Information on whether call transfer is carried out in talk or ringing state is station-related (information about the partner transaction can be derived from the "CONNECT sent to DH").
- Call transfer is always initiated on the held transaction.

10.25.2.4 Three-Party Conference

- The three-party conference is not initiated from a normal consultation hold. The required memory concatenation is therefore not available.

10.25.2.5 Call Waiting (CW)

- Several calls can be signaled using CW.
- The B party needs an individual COS in order to be able to use this feature.
- CFB is performed with NDUB without signaling the call using CW.
- CFB is performed with UDUB if all stations acknowledged the CW call negatively (the reason for release is stored in the DH. USER_BUSY overwrites all other release reasons but is not overwritten).

10.25.2.6 Callback (CCBS) WP3

- Only Callback on busy is supported. Callback on no answer is not possible.
- The system waits for a certain period of time after the destination station goes on-hook before activating the callback.
- During this time, or while the idle state is being signaled to the requesting party, the station cannot be seized by incoming calls(NDUB).
- The station can query the status of the callbacks (or a callback to a certain station).
- If callback cannot be initiated the A station must be informed.
- Callback request of stations which then became busy become inactive. As soon as the requesting party becomes idle the callback request becomes active. This information is entered in the callback queue.
- CCBS is only available for all services for DSS1 connections. For the Telephony service CCBS is always available (also for mixed connections e.g. DSS1 with system terminal).

10.25.2.7 Called Party Display Suppression (COLR)

- If a system terminal calls just such a DSS1 station
  - the station number and the name of the called party is displayed before an ALERT is transmitted. The COLR service is therefore not possible on system terminals.
  - first the ringing tone is injected followed by the busy tone if the DSS1 terminal is busy or does not answer the call. This fact was discovered with cordless stations and declared unacceptable. This behavior cannot, however, be avoided when DSS1 is implemented.
  - callback on busy is no longer available for system terminals (there is no busy station). This is also applicable, if there are no available B channels (Feature Call Waiting CW).
- A DSS1 station can call itself (under it's own station number).
- Any DSS1 station in a hunting group is always the terminating station, as it is always idle (for the system). It can, however, report busy. The call is then not transferred to an idle station in the hunting group. Concatenation of hunting group and CFx is therefore performed.
- If this restriction is not desired for certain stations (e.g. cordless), then the MULTRA parameter must not be assigned.

10.25.2.8 Advice of Charge

If CDR is activated, the option table can be used to define whether AOC-D and AOC-E or only AOC-E is enabled.

If bit 4 in byte 3 of the option table is activated, AOC-D is blocked.

10.25.2.9 Malicious Call Identification

10.25.2.9.1 Feature Description

MCID includes the following variants:

- automatic recording of the calling party's data
- recording of nuisance callers: those are users who release the line before the connection is established. If a new incoming call is signalled at the called party and the call is released, the calling party is registered in the destination PBX.
- manual activation of MCID: in active call state and immediately after the release of the connection the called party can instigate registration in the destination PBX by either pressing the appropriate key or by dialling the corresponding code.

10.25.2.9.2 Feature Characteristics

In addition to the station numbers of the calling parties, the station numbers of forwarded parties are also registered.

10.25.2.9.3 AMO Batch for Stations

Malicious Call Identification is administrated for all stations using COSSU AMO. The following configuration variants are possible:

- automatic registration of all incoming calls

```
CHA-COSSU: TYPE=COS,COS=6, AVCE=MCIDM&TRACE;
```

- manual registration of calls in call state and after the release of the connection by the calling party

```
CHA-COSSU: TYPE=COS,COS=6, AVCE=MCIDM;
```

- registration of nuisance callers:

```
CHA-COSSU: TYPE=COS,COS=6, AVCE=MCIDA;
```

The MCIDA and MCIDM authorizations can be combined. This allows the registration of both nuisance and individual calls.

Attention: MCIDM, TRACE and MCIDA should not be combined as automatic registration also records nuisance calls.

10.25.2.9.4 AMO Batch for Networks

If a connection which uses a DSS1 gateway is to be registered throughout a network the COP parameter MICC must be set at the DSS1 gateway (user side). This allows network-wide registration after the connection release.

```
CHA-COT:COTNO=4, COTTYPE=COTADD, PAR=MICC;
```

If network-wide registration is activated, setting the COT parameter MIIH will instigate registration in a node. If the parameter is set, the registration request is not transferred to the origination node.

```
CHA-COT:COTNO=4, COTTYPE=COTADD, PAR=MIIH;
```

10.25.2.10 Terminal Portability

Terminal Portability allows short-time parking of a call. By entering a two digit identification number the call is parked in the node. As long as the call is not resumed, the terminal can be exchanged or disconnected. It is also possible to resume the call from a different terminal linked to the bus by entering the identification number.

A call can only be parked for a maximum of two minutes.

- configuration: In COS, the parameter TP must be activated for the voice service and bit 6 in byte 3 of the assigned option table must be set.
- restriction: if the station is member of a call pick-up group, the call cannot be parked in the PU. It is, however, possible to transfer a parked call from the PU.

10.25.3 Service Information

- DSS 1 terminals should always be configured for the VOICE&FAX & DATA services.
- If a busy DSS1 terminal is called by a system terminal, the ringing tone is injected first, followed by the busy tone.
- The COS of the terminals must include the MULTRA parameter. Otherwise, the new services cannot be used.
- Calls on hold are released when the holding party goes on-hook. There is no recall.
- A separate buffer for FWD must be generated in DIMSU AMO. Dimension the buffer as follows: number of DSS1 terminals x 3.
- In ZAND AMO, the OPTLOAD table must be adjusted (development).
- The maximum number of callbacks is set in SBCSU AMO.
- New COS are implemented in AMO COSSU.
- If the MULTRA parameter is set, a DSS1 terminal can no longer be used in a hunting group.
- The secretary function is not implemented.
- Changes to the AMO surface.
- COSSU parameters for CCBS and Call Waiting.
- New branch for FWDDSS1 (AMO ZIEL).
- Transfer by release is not possible (separate function).
- Callback from a system terminal is possible with restrictions.
- COLR to a system terminal is not possible.
- DSS1 terminal can call itself: no
- If on a Profiset50 a 4-digit number is displayed without a name, the first digit disappears after a brief period of time.
- The feature groupcall in AUN-Group is not possible for DSS1 terminals.
- DSS1 terminals cannot dial the code for PSE (paging equipment)

10.25.4 Generation (Example)

- Configure COS for the DSS1 terminal

```
ADD-COSSU:NEWCOS=22,AVCE=TA&TNOTCR&DATA&MSN&
MULTRA&CCBS&COLR&CW,AFAX=TA&TNOTCR&BASIC&MSN&MULTRA,

ADTE=TA&TNOTCR&BASIC& MSN&MULTRA,.....;
```

- Bus configuration of the MAINO 7185 with MSN 7186 on S0 bus (SLMS)

```
ADD-SBCSU:STNO=7185,OPT=FBUS,CONN=DIR,PEN=1-2-37-5,
DVCFIG=SET600&DTE&FAX&TTX&VTX,COS1=22,COS2=5,LCOSV1=1,
LCOSV2=1,LCOSD1=1,LCOSD2=1,SPROT="SBDSS1",TPROT="SBDSS1",VPRO
T="SBDSS1",FPROT="SBDSS1",DPROT="SBDSS1",PERMACT=Y,INS=Y,ALAR
MNO=0,SOPTIDX=10,TOPTIDX=10,VOPTIDX=10,FOPTIDX=10,DOPTIDX=10,
EXTBUS=Y,CBKBMAX=5;
```

- ADD-SBCSU:

```
ADD-SBCSU:STNO=7186,OPT=MSN,MAINO=7185, COS1=22,COS2=5,
LCOSV1=1, LCOSV2=1,LCOSD1=1,LCOSD2=1, INS=Y;
```

- Point-to-point configuration on SLMS/STMD with MAINO 7184 Unlike with bus configuration, all possible services are configured identically.

```
ADD-SBCSU:STNO=7184,OPT=FPP,CONN=DIR,DVCFIG=S0PP,
COS1=22,COS2=5,LCOSV1=1,LCOSV2=1,LCOSD1=1,LCOSD2=1,
DPLN=0,PROT="SBDSS1",INS=Y,OPTIDX=10,CBKBMAX=5;
```

- Configuration of the MAINO 7183 via PNT on SLMU

```
ADD-SBCSU:STNO=7183,OPT=FBUS,CONN=PNT,DVCFIG=SET600&
DTE&FAX&TTX&VTX,COS1=24,COS2=5,LCOSV1=1,LCOSV2=1,LCOSD1=1,LCO
SD2=1,DPLN=0,SPROT="SBDSS1",TPROT="SBDSS1",BPROT="SBDSS1",FPR
OT= "SBDSS1",DPROT="SBDSS1",INS=Y,
SOPTIDX=10,TOPTIDX=10,VOPTIDX=10,
FOPTIDX=10, DOPT=10,CBKBMAX=5;
```

Option table

The option table consists of a series of hexadecimal numbers which partly have switch functions and are partly used for the configuration of feature parameters such as CCBS and UUS.

All other fields of the option table must not be changed since this would endanger protocol conform functioning.

The following table contains the option table assigned to the corresponding station:

Station	Protocol variant	Option table
EURO-ISDN station of the KRONE company	SBQ9311	2
Integrated terminal adapter	SBQ9311	2
CMI/NW-CHESE	SBQ9311	6
UNIX in ADS	SBQ9312	3

Station	Protocol variant	Option table
DKZ-N1 station	SBDKZN1	1
DSS1 station	SBDSS1	10
Terminal adapter ELMEG 1TR6	SB1TR61	1
S0 Cards (No output of layer 3 fault messages)	SBQ9311	4

- Assigning an option index to a station

  Assign a certain option index (1-10, see table) per configured service to the functional stations on the bus using the SBCSU AMO. The option index then refers to the corresponding option in the database:

  ```
  ADD-SBCSU:STNO=4711,OPT=<FBUS/MBUS/OPTI/OPTIEXP>,...
  ,SOPTIDX=<opt-voice>,TOPTIDX=<opt-ttx>,
  VOPTIDX=<opt-vtx> ,FOPTIDX=<opt-fax>,
  DOPTIDX=<opt-dte>;
  ```

  or for point-to-point connections:

  ```
  ADD-SBCSU:STNO=4711,OPT=<FPP/MSN>,OPT=<opt>;
  ```

  IMPORTANT: If no OPT or xOPT-(X=S/T/B/F/D) value is set during terminal configuration, the AMO automatically enters xOPT=1 or OPT=1.

- Later option modification

  If problems occur with EURO-ISDN features although the option table was loaded (DIS-ZAND:TYPE=OPTTBL), the adjustment of an option in the database could be required. Every option consists of 100 bytes. It is possible to modify an option in the database byte-by-byte using AMO ZAND: address the option via the table index (1-10) and the number of the byte to be modified (1-100). Enter the new value to be assigned to the byte in hexadecimal form. Every option also has a name that can be modified:

  ```
  CHA-ZAND:TYPE=OPTTBL,IDX=number,BYTE=number,
  VALUEOPT=FF[,NAME="..."];
  ```

  IMPORTANT: Due to the meaning of the individual bytes only known CP internally, options should only be modified by specialists and should only be performed (with the exception of name modification) after consultation with ICN WN ES D. Every new HD option table (e.g. APS modification) must be loaded into the database using AMO ZAND. The AMO, however, only allows loading of entire tables (selective reloading of individual options is not possible). All options in the database are therefore overwritten and any previous individual adjustments are lost.

10.25.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
COSSU	UUS1IM	d	User-User Service 1 Implicit
	UUS1IM	e	User-User Service 1 Implicit
	UUS3	d	User-User Service 3
	UUS3	e	User-User Service 3
	MCIDM	d	manual MCID allowed
	MCDIM	e	manual MCID allowed
	MCIDA	d	MCID for ring-disturber
	MCDIA	e	MCID for ring-disturber
	TP	d	Terminal Portability
	TP	e	Terminal Portability
COT	MICC	d	MCID Auslösekontrolle notwendig
	MICC	e	MCID release control necessary
	MIIH	d	Lokales Audrucken von MCID durchführen
	MIIH	e	execute lokal printout of MCID

10.25.6 Glossary

NDUB network-determined user busy

UDUB user-determined user busy

10.26 E911 Emergency Call

10.26.1 Feature Description

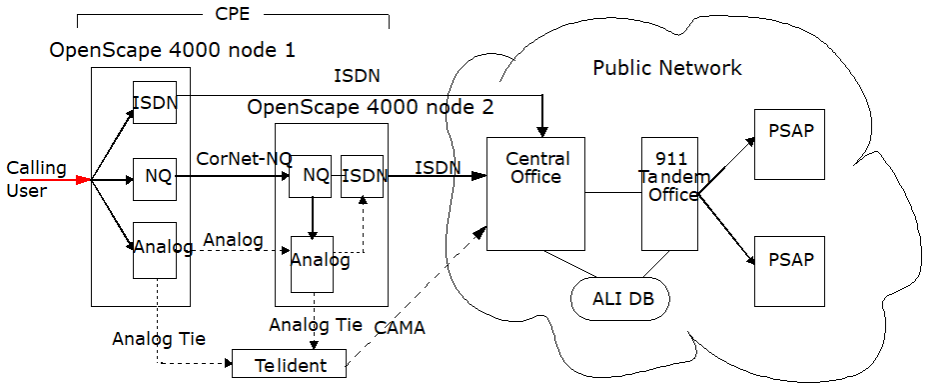


Figure 102: E911 Network Configurations

An E911 emergency number is dialled out from a user who chooses the E911number e.g. "9 "" 1 "" 1" to get a connection to the PUBLIC Safty Answering Point (PSAP). The E911 phone number can also have another numeric string which is provided by administration.

The emergency call number E911 is connected with high priority via ISDN direct to the Central Office. The emergency number has also injected into the setup data about the geographical location of the physical apparatus from where the call was made. This is acheived by means of a code (LIN) with the Calling party's number . This transmitted data are identified by a data base (Ali) (PSAP) and further information given to an operator such as floor or room location.

E911 connection can also be made via a Transit systems (also OpenScape 4000) with CorNet-NQ, CorNet-N and Analog connections All information cannot be transmitted by CorNet N or analog connection. The missing information of CPN, LIN is completed in the next OpenScape 4000 system with the data of its own. The LIN is read from the Circuit and the CPN comes from the system.

In Network connections from the subscriber to the PSAP including transit connections ,EMCYRTT=Y must be set on all E911 Routes. Also on circuits used for E911 a LIN must be administered and in every system a System wide emergency callback number in AMO ZAND configured, this is required to transmit the information about CPN and LIN for E911 calls to the relevant correctly registered PSAP.

10.26.2 Central Office (CO) Requirements

As a prerequisite for using ISDN PRI trunks for E911 calls, the serving CO must support this function. Specifically, the CO must be capable of receiving and processing LIN information that is in a Codeset 5 Generic IE contained in a SETUP message.

10.26.3 User Interface

10.26.3.1 Subscriber

Dialling an E911 telephone number is seen and is carried out by the subscriber in the same way as a normal telephone number.

10.26.3.2 Administrator

10.26.3.2.1 Central System configuration

The administrator must assign memory with AMO DIMSU to be able to manage the LIN data. This is about 10% to 20% of the maximum available system ports.

A system-wide phone number must be registered in the AMO ZAND, This phone number is used in the case of a missing subscriber number. This is to enable the PSAP operator to call back in the case of a disconnection.

10.26.3.2.2 Port and Subscriber Data

Every Port in the system must have a LIN configured, This is configured with AMO LIN. Several ports can have the same LIN configured provided they are located in the same office, factory section, laboratory or room.

NOTICE: The LIN used in this document is for example only!

Every subcscriber must be assigned a second phone number with the AMO SDAT which is obtainable from the external CO. This second phone number is used together with the E911 emergency call and is transmitted with the call.

10.26.3.2.3 Call Handling and Networking

A E911 Emergency number must be configured in AMO WABE .

In LCR the routes over which an E911 emergency call are to be routed are specially marked as emergency routes. Special outdial rules for the E911 switching have to be configured to take into account both ISDN and Analog connections

In AMO BUEND it is possible to mark lines or B channels as reserved for the E911 connections.

Connections via Analog or Digital require COT Parameters to Filter or release Information which are transmited over the analog line or digital Protocoll.

Special care has to be taken when networking that both partners "understand" each other regarding the transmission of information. The parameters must be co-ordinated on both sides for outgoing and incoming connections (e.g. analog to analog)..

10.26.4 Service Information

This feature is based on The U.S protocol variants. A set of protocols is created for different U.S. phone network operators and can be copied and loaded into the DB and the Hard Disk by means of AMO Prode..

With `DISPLAY-PRODE:SRC=HD,KIND=PVCDSHRT;` the PVCDNR for the "UNITED STATES OF AMERICA" can be found.

For MOBHFA functionally to work correctly with E911, LIN must be configured directly in the GUI of the phone device. Further configuration hints are available under KM209494 (https://gsikm-productive.unify.com/rkm/viewdoc.jsp?doc=209494).

10.26.5 AMO Usage

10.26.5.1 Basic AMOs

10.26.5.1.1 PRODE

- Create the U.S.A protocol variants in the Database
  ```
  COPY-PRODE:PVCD,16;
   DIS-PRODE:DB,VARTAB;
  ```
  PVCD,16 selects the "UNITED STATES OF AMERICA" Protocol variant which is described in the table VARTAB.

10.26.5.1.2 DIMSU

Add the memory requirements for the number of entries in the LIN table

1) `ADD-DIMSU:TYP=USER,LIN=1000;`

10.26.5.1.3 ZAND

Configure central system data to support the E911 feature requirements

1) `CHA-ZAND:TYPE=ALLDATA2,OOSTONE=YES,ECN=004114953111;`

OOSTONE:- For the signed off subscriber no E911 dialling is possible with this parameter a tone can be configured so that the subscriber can notice that this Apparatus is not usable.

ECN-This is the System wide Callback Number for Emergency Calls. This number must be configured in the International Number format with Prefix digits. This Number works internally with the TON=unknown and NPI=ISDN. Care has to be taken when sending out this number over analog lines that a limit of the length is configured. See section " LODR"

10.26.5.1.4 SDAT

- Configure a public number for the subscriber

  ```
  CHA-SDAT:STNO=3560,TYPE=DATA1,PUBNUM=3863560,
  NPI=ISDN,TON=SUBSCR;
  ```

  PUBNUM Is the phone number which from an external source would lead to this subscriber.

10.26.5.1.5 BUEND

- Reserve B channels of a trunk group for E911
  ```
  ADD-BUEND:TGRP=91,NAME="E911 TO PSAP",NO=2,RSV=YES;
  ```
  RSV :-This B-Channel group is reserved for E911.

10.26.5.1.6 REFTA

```
ADD-
REFTA:TYPE=CIRCUIT,PEN=1-2-121-6,PRI=80,BLOCK=N,READYASY=Y;
```

READASY in the case of no synchronisation a connection setup is still possible.Otherwise it would be waiting on the complete synchronisation

10.26.5.1.7 WABE

- Add entries in the Dial Plan
  ```
  ADD-WABE:CD=911,DAR=CO;
  ```
  CD is the E911 Emergency number

  DAR Is for the connection to the Central office. Set up with the entry CO

10.26.5.1.8 RICHT

- Create a route to be used for E911
  ```
  ADD- RICHT:MODE= LRTENEW ,LRTE=91,
  ROUTOPT=N,REROUT=N,EMCYRTT=YES;
  ```
  EMCYRTT is the identification for the E911 emergency number route. The connection set-up is carried out with a high priority.

10.26.5.1.9 LIN

- Add Location identification numbers to a station and a PEN
  ```
  CHA-LIN:TYPE=STNO,STNO=3560,LIN1=9110003560;
   CHA-
  LIN:TYPE=PEN,LTG=1,LTU=2,SLOT=79,CCT=0,LIN1=191112790;
  ```
  STNO the LIN is assigned to the subscriber.

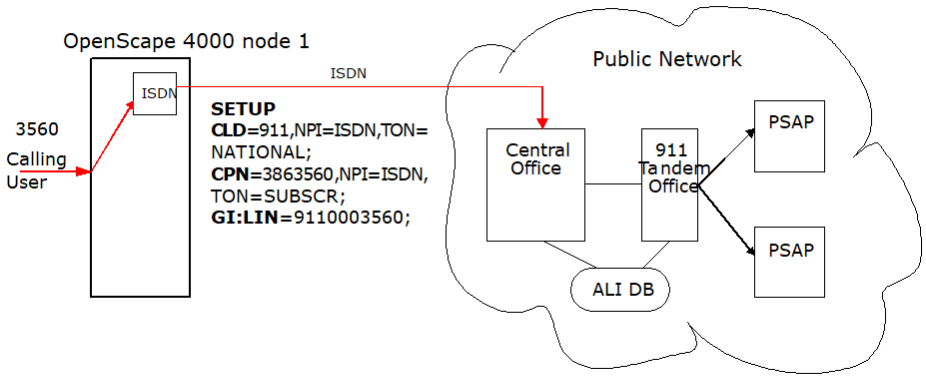
  PEN The LIN is assigned to a position e.g. a circuit.

10.26.5.1.10 COT

The following COT parameters need to be configured to support the E911 feature.

- SECO Causes the LIN to be sent in the Generic information for LIN code set 5 format
- RLIN informs the system that on this connection LIN data will be received. If the parameter is no set then the recieved LIN digits are interpreted as CPN.

10.26.5.2 ISDN Connection to the C.O.



10.26.5.2.1 TDCSU

```
ADD-TDCSU:OPT=NEW,PEN=1-2-121-6,COTNO=91,COPNO=91,
LCOSV=1,LCOSD=1,CCT="E911 ECS",DESTNO=91,PROTVAR=NI2,
SEGMENT=1,ISDNIP=00,ISDNNP=0,NNO=9-1-1,DEV=S0COD,TGRP=91,
BCNEG=Y;
```

All these parameters must be coordinated with the Central Office.

10.26.5.2.2 COT

```
CHA-
COT:COTNO=91,COTTYPE=COTADD,PAR=...IEVT&BLOC&NLCR&PRI&SECO;
```

Parameter Description:

- NLCR No LCR data will transfer over this line
- SECO activates the sending of the GI:LIN
- PRIO configures the connection with high prioriy.

10.26.5.2.3 LODR

```
ADD-LODR:ODR=31,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=31,CMD=SENDCOMP;

ADD-LODR:ODR=31,CMD=NPI,NPI=ISDN,TON=NATIONAL;
```

Parameter description:

- FIELD Causes that only the E911 phone number (911) is sent out.(FIELD =1)
- SENDCOMP configures that the dialling is complete.
- NATIONAL sets the E911 number in the National Format .

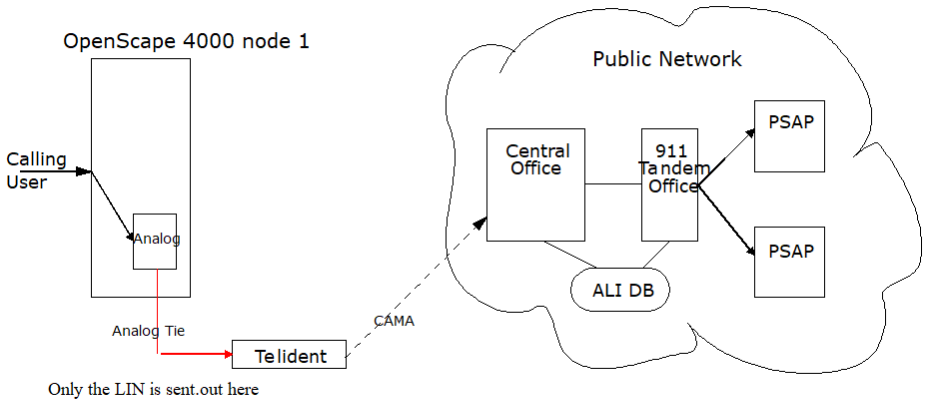
10.26.5.2.4 LDPLN

```
ADD-LDPLN:LDP=911,LROUTE=91,LAUTH=1,SPC=22,PINDP=N;
```

Parameter description:

- PINDP No pin is required to reach the C.O for this dial pattern.
- LDP Configures the E911 call number "9""1""1"

10.26.5.3 Analog Connection to the C.O.



10.26.5.3.1 LODR

```
ADD-LODR:ODR=32,CMD=SENDCOMP;

ADD-LODR:ODR=32,CMD=CPNLIN,DGTS=9;
```

Parameter description:

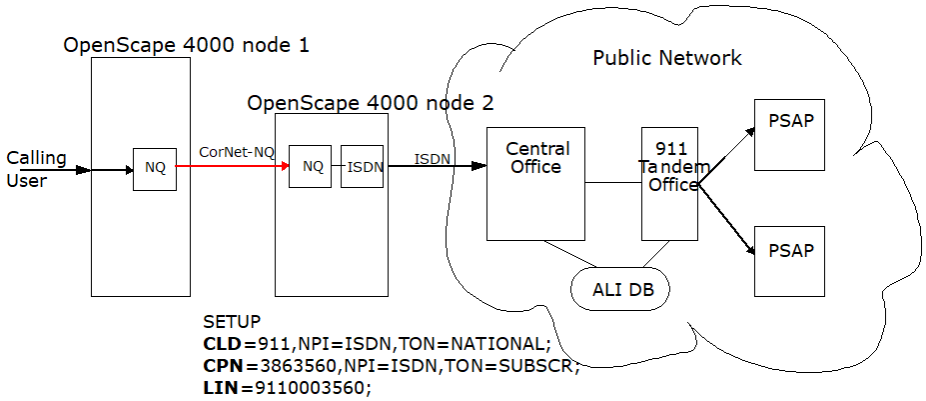
- SENDCOMP configures that the dialling is complete.

- CPNLIN Causes the LIN(9110003560 From AMO LIN)to be sent out
- DGTS Configures how many numbers are sent for the LIN. If the LIN is shorter than this value then 0's are added. If the LIN is longer than this setting then it is shortened to this value

10.26.5.3.2 LDPLN

```
ADD-LDPLN:LDP=911,LROUTE=91,LAUTH=1,SPC=22,PINDP=N;;
```

10.26.5.4 Digital Networking OpenScape 4000



The element LIN is a private element and when networking with private protocols such as CorNet-NQ and segment length =1 the private elements are not transferred. Segmentation should be set to 8.

In the OpenScape 4000 node 2 a LIN must be configured on the port which leads to OpenScape 4000 node 1. The OpenScape 4000 node 2 won't transmit any LIN data of the OpenScape 4000 node 1, uses the LIN of this port for the E911 connection. In all systems EMCYRTT=YES must be set.

10.26.5.4.1 TDCSU node 1

```
CHANGE-TDCSU:PEN=1-2-121-6,PROTVAR=PSS1V2,SEGMENT=8,
DEV=S0CONN;
```

10.26.5.4.2 TDCSU node 2

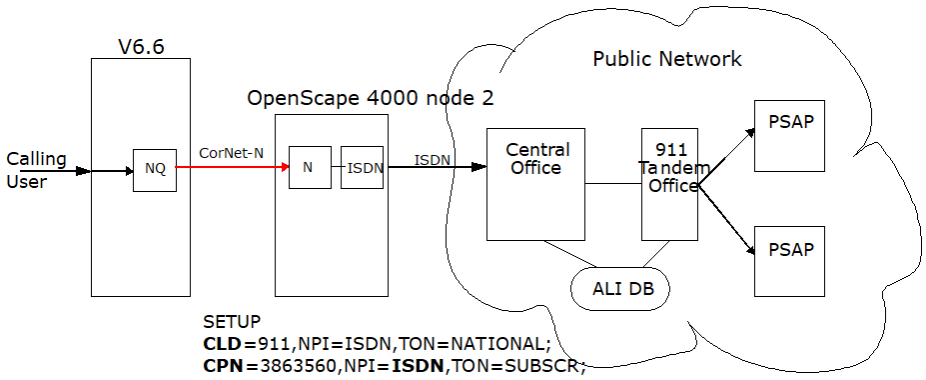
```
CHANGE-TDCSU:PEN=1-2-121-6,PROTVAR=PSS1V2,SEGMENT=8,
DEV=S0CONN;
```

10.26.5.4.3 LIN node 2

```
CHANGE-LIN:TYPE=PEN,LTG=1,LTU=1,SLOT=121,CCT=6,LIN1=....
```

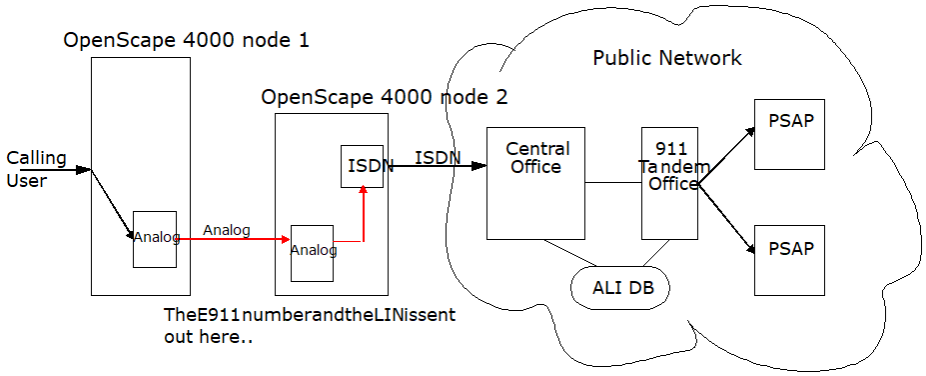
The Circuit is assigned the LIN1 on the CorNetNQ. circuit

10.26.5.5 Digital Networking V6.6



The CPN from a V6.6 system has to be NPI=ISDN, otherwise the CPN in the Setup will be replaced by the systemwide CPN of the OpenScape 4000 node 2.

10.26.5.6 Analog Networking



10.26.5.6.1 LODR node 1

```
ADD-LODR:ODR=31,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=31,CMD=SENDCOMP;

ADD-LODR:ODR=31,CMD=NPI,NPI=ISDN,TON=NATIONAL;

ADD-LODR:ODR=31,CMD=CPNLIN,DGTS=9;
```

10.26.5.6.2 LDPLN node 1

```
ADD-LDPLN:LDP="911",LROUTE=91,LAUTH=1,SPC=22,
PINDP=N;
```

10.26.5.6.3 COT node 2

```
CHANGE-COT:COTNO=221,COTTYPE=COTADD,PAR=RLIN;
```

- RLIN sets on this connection LIN data will be received. If the parameter is not set the reccieved LIN is interpreted as CPN.

10.26.5.6.4 LIN node 2

```
CHA-LIN:PEN=...,LIN1=....
```

10.26.5.6.5 TACSU node 2

```
CHA-TACSU:PEN=1-2-37-36,LIN=9;
```

- LIN Defines how many LIN digits are to be expected . When LIN numbers collected have reached this length the rest of the digits will be ignored.

10.26.5.7 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
DIMSU	LIN	d	Anzahl von standortinformationen fuer notruf
DIMSU	LIN	e	Number of location identifiers for emergency calls
PRODE	PVCD	d	Die US-PVCD Nummer ist 16
PRODE	PVCD	e	The U.S. PVCD number is 16
ZAND	AUSBETON	d	Auser betrieb ton fuer abgemeldet teilnehmer
	RRNONOTR	d	Rueckrufnummer fuer notruf
ZAND	OOSTONE	e	Out of servicre tone for signed off devices
	ECN	e	System wide emergency callback number
LIN	LIN1/LIN2	d	Standort Identifizierungs nummer 1/2
LIN	LIN1/LIN2	e	Location Identification number
RICHT	EMCYRTT	d	Notfallsroute
RICHT	EMCYRTT	e	Emergency route
COT	SECO	d	
	RLIN	d	
COT	SECO	e	Send emergency number in genric I.E.
	RLIN	e	Recieve LIN digits
LODR	CPNLIN	d	
LODR	CPNLIN	e	Send LIN or CPN (max 22 digits)
TACSU	LIN	d	Laenge der LIN fuer notruf
TACSU	LIN	e	Length of LIN for E911
REFTA	READYAS	d	READYAS = JA
REFTA	READYAS	e	READYAS =Y

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
BUEND	RESERV	d	RESERV=JA
BUEND	RESERV	e	RSV =Y trunk group reserved for E911

10.26.6 Notifications for emergency calls

Kari's Law compliance

Being compliant with Kari's Law involves telephone systems supporting specific notifications in case of an emergency call.

NOTICE: Kari's Law and Ray Baum Act are specific laws governing dialing, notifications and location information required when users dial emergency services – 911.

Requirements for Kari's Law:

- Any user can direct dial to 911 without requiring an access code.
- Provide a notification to a central point (e.g. E-mail, SMS) anytime the 911 emergency number has been dialed.

Ray Baum's Act requires an additional feature:

- The system must transmit critical data directly to 911 centers, including data about the location where the call has been initiated (Location Information for the 911 caller (LIN)).

The notification shall include the following information:

- The fact that a 911 call has been initiated
- A valid callback number
- Information about the caller's location (LIN)

The OpenScape 4000 system will send a F2757 HISTA message whenever an emergency call has been initiated, giving the possibility of taking actions based on it.

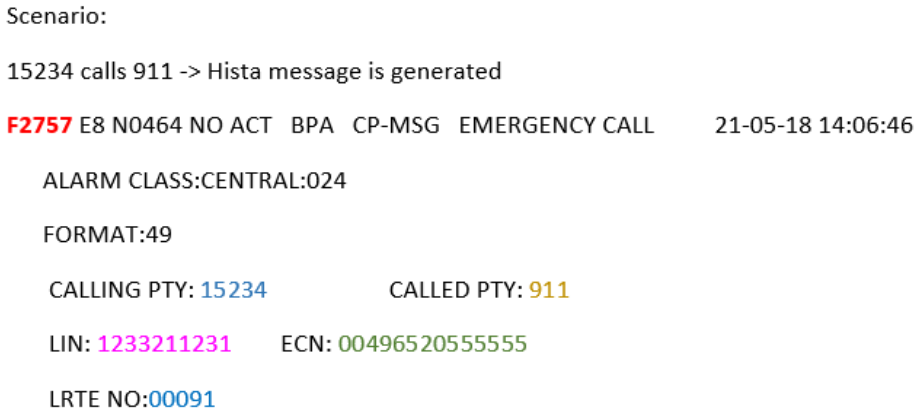


Figure 103: F2757 HISTA message

10.26.7 E-mail notification of system errors

Starting with the introduction of the new F2757 alarm which allows to send a notification every time an emergency call has been initiated, a new notification mechanism has been introduced.

This feature uses the SNMP service, which needs to be enabled in the Assistant. To enable the SNMP/SMTP service you need to navigate to Application Control.

By enabling the SNMP service, you can access SNMP/SMTP Configurator page, under Diagnostics/Fault Management/SNMP/SMTP Configurator. Here, in addition to the old configuration, a new SMTP entry has been added.

NOTICE: Before configuring the SMTP notification mechanism, please note that all the alarms are enabled by default. The system generates some of the alarms several times a minute, therefore a flood of messages may occur. This may result in restrictions on the email server/provider.

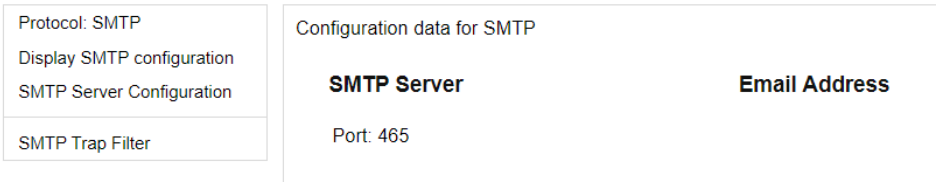


Figure 104: SMTP Server

If the SMTP protocol is selected, the menu box displays specific items, and the configurator allows to:

- Display the existing configuration (SMTP Server, Email Address);
- Specify all needed information for sending an e-mail when a specific alarm occurs;
- Test the email settings by sending a test email using the saved configuration;
- Configure a trap filter to enable/disable the alarms for which the e-mails are sent;
- Reset the configuration to the default values. This will result in no information for the SMTP Server and Email Address. Additionally, all available alarms are enabled.

To use the notification mechanism, an email server is needed which should be accessible for the Assistant.

For configuration select the SMTP protocol, then select in the left menu the SMTP Server Configuration.

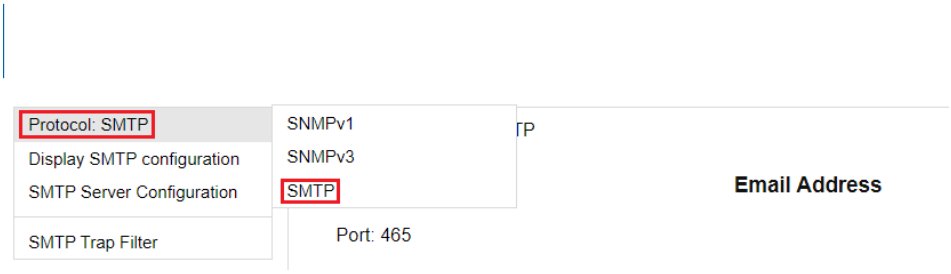


Figure 105: SNMP/SMTP Configurator

10.26.7.1 SMTP Server Configuration

Here the host name or the IP of your email server must be entered. Based on the email server configuration you can use an account to authenticate. The port must be changed if the default one is not used.

In addition to the server configuration, you need to insert the recipients of these notifications. Similar to any email client, there are three fields: To, Cc, and Bcc. These fields can be used as requested, and several recipients can be added using coma or semi colon.

The Subject field can be configured as well based on the requirements. The %alarm variable can be used in case the Subject needs to includes the F number that generated the alarm.

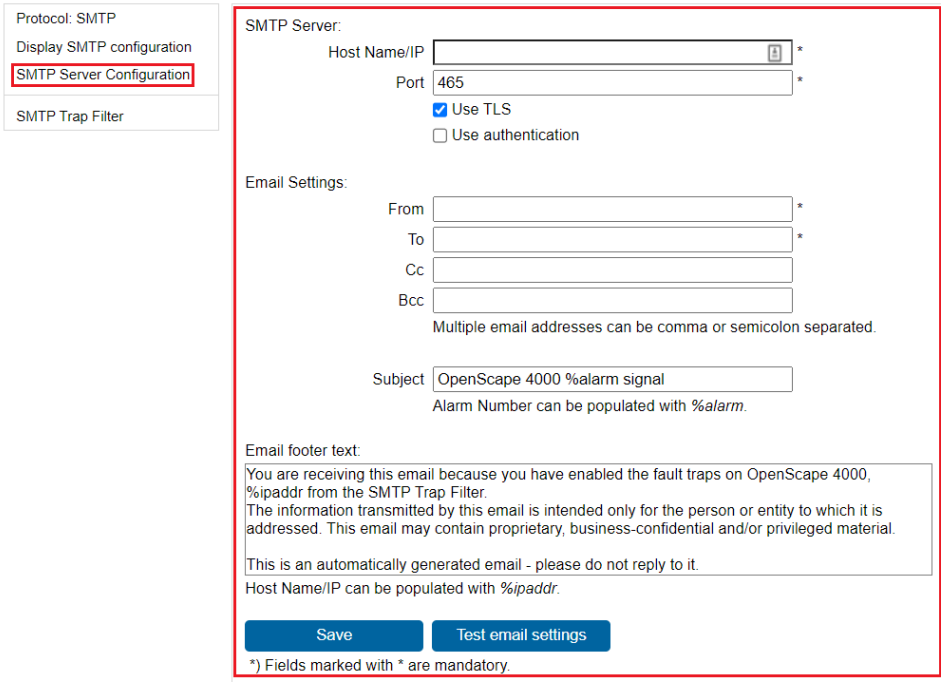


Figure 106: SNMP/SMTP Configurator

By pressing the Save button, the data is directly saved to the database. To check the configuration, use the Test Email Button that will send a test email to all the configured recipients.

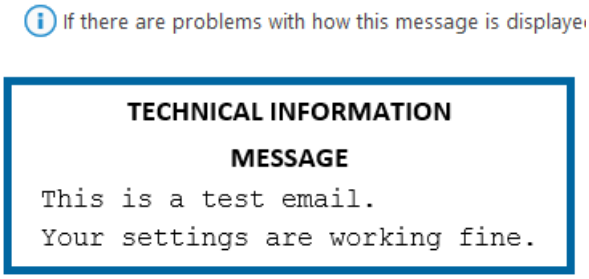


Figure 107: Test email

10.26.7.2 Trap Filter

As mentioned before, all the alarms are enabled by default. It is recommended to filter out the alarms and chose only specific alarms based on your needs. Some of the alarms can be generated by the system several times a minute so a flood of emails may occur.

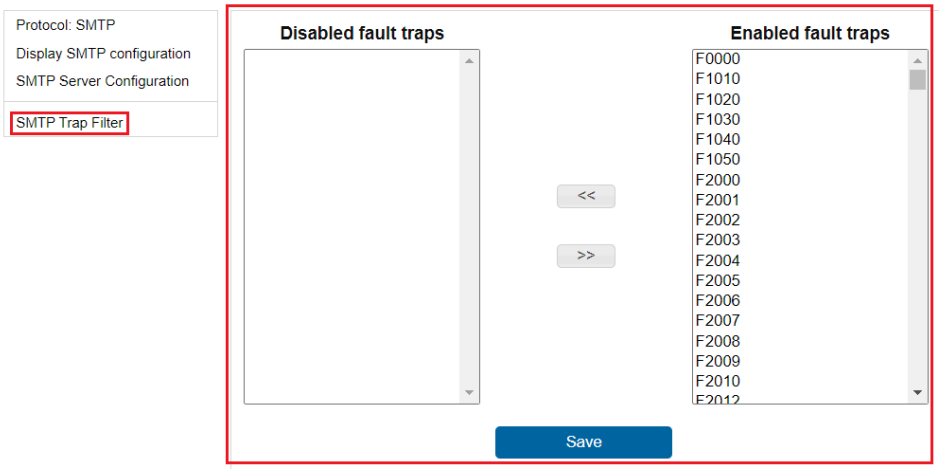


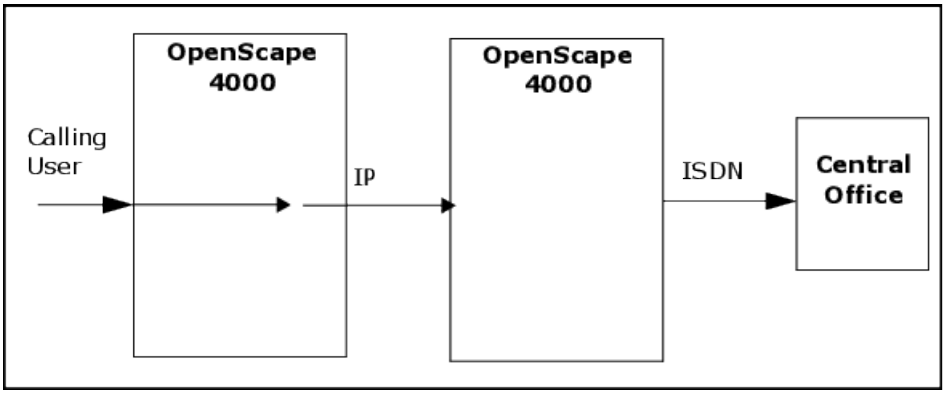
Figure 108: Trap filter

When the configuration is completed, emails like the following one should be generated on each entry that occurs in the HISTA system:

Figure 109: Example of an email notification

10.27 Emergency Call

10.27.1 Feature Description



The Richtlinie Notrufverbindungen (TR Notruf) of the Bundesnetzagentur requires to send address information within call signaling of an emergency call. This requirement is for OpenScape 4000 subscribers, DSS1 and SIP trunks in Germany.

The address information is added to the LIN table entries. Call Processing reads the address information in case of an emergency call, packs it into an ISDN User Info Element and sends it in the ISDN SETUP message to the Central Office. Trunks to a Central office which do not support TR Notruf are marked with a Class of trunk parameter (**NOEA**) and address information is not sent. The latter functionality is needed in multinational OpenScape 4000 deployments.

Normal treatment is given to User Info elements received from the Central Office, e.g the element is passed on to devices and/or applications.

10.27.2 Service Information

- For MOBHFA functionally to work correctly, LIN must be configured directly in the GUI of the phone device.
- It is not required to recognize and act upon received address information from the CO.

10.27.3 Generation (Example)

AMO LIN

```
CHANGE-LIN:TYPE=STNO,STNO=4711,ZIPCODE=81379,
STRNAME=Sesam Street,STRNUM=123;
```

It is possible to delete the fields with **OPT=ADDR** in DELETE branch:

```
DELETE-LIN:TYPE=STNO,STNO=4711,OPT=ADDR;
```

AMO ZANDE

Parameters for system-wide address

```
CHANGE-ZANDE:TYPE=ADDR,ZIPCODE=81379,
STRNAME=SESAM STREET,STRNUM=123;
```

IMPORTANT: The entry in AMO LIN has a higher priority than the entry in AMO ZANDE. This means that the entry in AMO ZANDE is only used, if the subscriber/trunk doesn't has an entry in AMO LIN.

AMO COT

Parameter **PAR=NOEA** (No Emergency Address)

10.27.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
LIN	ZIPCODE	d	Postleitzahl
	ZIPCODE	e	Zip Code
	STRNAME	d	Straßenname
	STRNAME	e	Street name
	STRNUM	d	Hausnummer
	STRNUM	e	Street number
	OPT=ADDR	d	Entfernen der Adressfelder (ZIPCODE, STRNAME, STRNUM)
	OPT=ADDR	e	Delete address fields (ZIPCODE, STRNAME, STRNUM)
ZANDE	ZIPCODE	d	Postleitzahl
	ZIPCODE	e	Zip Code
	STRNAME	d	Straßenname
	STRNAME	e	Street name
	STRNUM	d	Hausnummer
	STRNUM	e	Street number
COT	NOEA	d	Keine Notfalladresse
	NOEA	d	No emergency address

10.28 Emergency Override/Disconnect

10.28.1 Feature Description

Network-wide "emergency override/disconnect" is used primarily in special-purpose networks, e.g. power supply or police networks, for authorized users in emergency situations. "Destination-dependent disconnect" takes place on connection setup to a specific destination by means of code dialing.

The "emergency override/disconnect" feature enables the caller to intrude on or disconnect busy digital (S0/S2 B-channels) or analog lines (with/without DIUC, not TMOM circuits) within a private network configuration. In addition, "emergency override/disconnect" is also possible for analog or digital tie-trunks or CO (exchange) trunks within a private network (for breakout to other networks).

Emergency override can be activated by authorized users by means of suffix dialing as soon as the busy or ATB state occurs.

Disconnect can be activated by authorized users by means of prefix dialing as a precautionary measure prior to entering the destination number or alternatively by means of suffix dialing as soon as the busy or ATB state arises.

Users without special classmarks can initiate destination-dependent disconnect to specific internal or external emergency destinations by dialing a special code, e.g. an emergency call number. This code implicitly contains both the disconnect request and the destination address. The connection to this destination is then set up with a precautionary disconnect request. If the code for destination-dependent disconnect refers to an internal destination, translation to a station number with PEN takes place. The code is assigned to the station number by means of an AMO.

The emergency override/disconnect features can be activated by DIGITEs and Attendant Consoles.

The emergency disconnect feature can be activated from ANATEs.

10.28.2 Service Information

- Limitation: suffix paging cannot be activated from ANATE.
- "Emergency override/disconnect" can be performed on busy DIGITE and ANATE, as long as there is no emergency override/disconnection protection activated.
- The DAR must be added on a NAME key to allow the feature to work from a Digite.

10.28.3 Generation (Example)

Configuring the "emergency override/disconnect" features

The procedure for configuring the features is described in the following.

Assigning digit analysis results (DAR) in the digit analysis

- Assigning the DAR "emergency override"
  AD-WABE:CD=<number>,DAR=EOVR;
- Assigning the DAR "disconnect"
  AD-WABE:CD=<number>,DAR=RELEASE;
- Assigning the DAR "destination-dependent disconnect" to an internal station
  AD-WABE:CD=<number>,DAR=STNREL,DESTNO=0;
- Assigning the DAR "destination-dependent disconnect" to an external subscriber in the system with destination system number <number>
  AD-WABE:CD=<number>,DAR=STNREL,DESTNO=<number>

Translating "destination-dependent disconnect" code to an internal number

With this conversion function the "destination-dependent disconnect" code, e.g. the emergency call number, is assigned a real station. Translation must be performed in the system of the station to which connections are set up with "destination-dependent disconnect". The station number must have a PEN configured.
AD-RUFUM:TYPE=DID=<n>,DID1,DID2=<m>;

1) DID1 code for "destination-dependent disconnect"

DID2 call number of an internal station with PEN (applies to internal/external in the system to which the station belongs).

Enabling "emergency override" or "disconnect" feature

The two features can be released independently of each other. For the "destination-dependent disconnect" feature the "disconnect" feature must be released with AMO FEASU.
CHA-FEASU:TYPE=A,CM=EMOVR;

CHA-FEASU:TYPE=A,CM=EMRLS;

Assigning COS "emergency override/disconnect"

SDAT AMO is used to set the COS for "emergency override/disconnect" for ANATE/DIGITE and AMO ACSU to set this COS for the AC.
CHA-SDAT:STNO=number,TYPE=ATTRIB,AATTR=EOVR;

or
CHA-ACSU:ATNDNO=number,EOVR=Y;

Assigning the "emergency override/disconnect protection" class of service

The emergency override/disconnect protection authorization can be assigned to DIGITEs with the SBCSU AMO, to ATNDs with the ACSU AMO and to ANATEs with the SCSU AMO.
CHA-COSSU:TYPE=COS,COS=<number>,AVCE=REOVR;

Enabling "emergency override/disconnect" on inter-PBX trunks

"Emergency override/disconnect" is possible on analog and digital inter-PBX trunks. The parameter class can be assigned with the AMOs TACSU and TDCSU. The COT parameter must be assigned to the connection in all systems involved.
CHA-COT:COTNO=<number>,COTTYPE=COTADD,PAR=PROV;

Enabling "emergency override/disconnect" breakout

"Emergency override/disconnect" is possible for analog or digital tie-trunks or CO (exchange) trunks within a private network, for breakout to other networks (e.g. PSTN). The network breakout point is the last possible emergency override/disconnect point in the connection path, since the emergency override/disconnect criterion is not transmitted beyond this point. The CO trunks or tie-trunks in question must be enabled by setting the following COT parameter:
`CHA-COT:COTNO=<number>,COTTYPE=COTADD,PAR=EODL;`

Administering external tone source for disconnect tone

The disconnect tone is signalled to the destination station after disconnection has taken place. The standard tone in Germany is NU tone. An external acoustic source connected via a SLMA can also be used for the disconnect tone.

E.g.:
`ADD-SSC:PEN=<ltg-ltu-ebt-port>,TYPE=EXTANN,CPCALL=DISCTONE;`

10.28.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
ACSU	VFNU	d	RUFNUMMER DES VF
	ATNDNO	e	ATTENDANT CALLING NUMBER
	NATR	d	Notaufschalten/Trennen JA=aktivieren
	EOVR	e	EMERGENCY OVERRIDE/FORCED HOLD YES=activate
COSSU	TYP	d	Verzweigungsparameter COS=ZU BEARBEITENDE COS
	TYPE	e	Desired cossu option COS=CLASS OF SERVICE
	ESBER	d	Einfuegen Sprachberechtigungen NATRS=SCHUTZ VOR NOTAUFSCHALTEN/TRENNEN
	AVCE	e	Add voice authorization REOVR = REJECTION OF EMERGENCY OVERRIDE
COT	COTNU	d	Class of Trunk Nummer
	COTNO	e	Class of Trunk

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	COTPAR	d	Parameterwerte für eine Class of Trunk NATR=Notaufschalten/Trennen NATL=NOTAUFSCHALTEN BZW. TRENNEN NUR LOKAL
	PAR	e	Parameter values of a Class of Trunk PROV=EMERGENCY OVERRIDE EODL=EMERGENCY OVERRIDE/ DISCONNECT ONLY LOCAL
FEASU	TYP	d	Typ der Verarbeitung FREI=FREIGEBEN VON LEISTUNGSMERKMALEN
	TYPE	e	desired class mark facility options A=ACTIVATED FEATURES
	LM	d	Leistungsmerkmal NOTAUF=NETZWEITES NOTAUFSCHALTEN NOTTR=NETZWEITES TRENNEN IM NOTFALL
	CM	e	feature, class mark, facility EMOVR=NETWORK-WIDE EMERGENCY OVERRIDE EMRLS=NETWOK-WIDE EMERGENCY CONNECTION RELEASE
WABE	RNR	d	Verzweigungsparameter
	CD	e	access code / station number
	KZP	d	Kennzahlpunkt NOTAUF=NOTAUFSCHALTEN TRENNEN=TRENNEN EINES TEILNEHMERS
	DAR	e	Digit analysis result EOVR=EMERGENCY OVERRIDE RELEASE=EMERGENCY RELEASE OF A STATION
RUFUM	TYP	d	Verzweigungsparameter DUWA=Durchwahlrufnummern
	TYPE	e	DID=DIRECT IN DIAL
	DUWA1	d	externe Durchwahlrufnummer
	DID1	e	DIRECT DIGIT INDIAL NUMBER
	DUWA2	d	interne Rufnummer (fuer Durchwahl)
	DID2	e	INTERNAL DESTINATION NUMBER (FOR INDIAL)

10.29 Entrance Telephone with Door Opener

- Add the configuration of the TMOM module

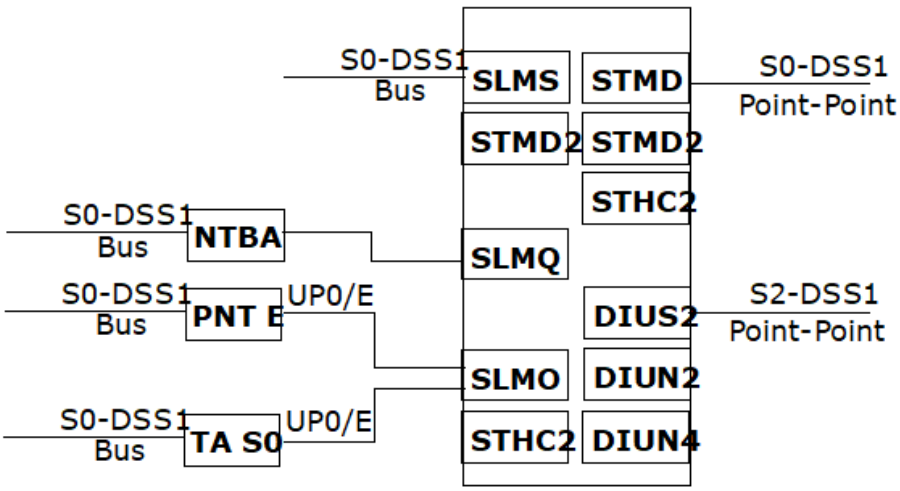
  ```
  AD-BCSU:MTYPE=PER,LTU=number,SLOT=number,
  PARTNO=string;
  ```
- Assign codes for the entrance telephone and door opener in the DPLN
  ```
  AD-WABE:CD=key-num,DAR=DOORCL&TORAUF;
  ```
- Assign a class of trunk
  ```
  AD-COT:PAR=NTON;
  ```
- Assign a class of parameter
  ```
  AD-COP:PAR=LSUP;
  ```
- Add trunk group
  ```
  AD-BUEND:NO=number;
  ```
- Add trunk circuit
  ```
  AD-TSCSU:COTNO=number,DEV=DOOR,COPNO=number;
  ```
- Assign a route to the entrance telephone for DOORCL and DOOROPEN

  ```
  AD-RICHT:TYPE=CD,CD=key-num,
  CPS=5&8&9&10&11&12,SVC=VCE,TGRP1=number;
  ```

10.30 EURO ISDN Terminals

10.30.1 Configuration

A functional terminal can be configured on the OpenScape 4000 via the interfaces shown in the diagram:



The terminal is configured with the following AMOs:

- AMO SBCSU: Configuration of terminal data for phone numbers and multiple subscriber numbers (MSN).
- AMO PRODE: Configuration of protocol tables that are assigned to a terminal.

- AMO ZAND: Modification of option tables which provide an important means of configuring a terminal.

Note that DSS1 terminals in the bus configuration always have to be configured for all services. The service protocols should generally be assigned to option table 10.

10.30.1.1 Configuration Examples

- Bus configuration of RNR 3270 with MSN 3271 on S0 bus (SLMS 1-1-25-2)

```
ADD-SBCSU:STNO=3270,OPT=FBUS,CONN=DIR,PEN=1-1-25-2,
DVCFIG=SET600&DEE&FAX,COS1=24,COS2=5,LCOSS1=1,
LCOSS2=1,LCOSD1=1,LCOSD2=1,SPROT="SBDSS1",
FPROT="SBDSS1",DPROT="SBDSS1",SOPTIDX=10,
FOPTIDX=10,DOPTIDX=10,EXTBUS=YES;

ADD-SBCSU:STNO=3271,OPT=MSN,MAINO=3270,
COS1=24,COS2=5,LCOSS1=1,LCOSS2=1,LCOSD1=1,
LCOSD2=1;
```

- Point-to-point configuration on SLMS/STMD with RNR 3177 In contrast to the bus configuration, all possible services are configured the same.

```
ADD-SBCSU:STNO=3177,OPT=FPP,CONN=DIR,PEN=1-2-31-0,
DVCFIG=S0PP,COS1=24,COS2=5,LCOSS1=1,LCOSS2=1,
LCOSD1=1,LCOSD2=1,COSX=0,PROT="SBDSS1",OPTIDX=10;
```

- Configuration of STNO via PNT E on SLMO

```
ADD-SBCSU:STNO=3100,OPT=OPTI,CONN=DIR,PEN=<number>,
DVCFIG=OPTISET,COS1=<number>,COS2=<number>,
LCOSS1=<number>,LCOSS2=<number>,
LCOSD1=<number>,LCOSD2=<number>;

ADD-SBCSU:STNO=3232,OPT=OPTIEXP,MAINO=3100,
DVCFIG=SET600&DEE&FAX,COS1=<number>,
COS2=<number>,LCOSS1=<number>,
LCOSS2=<number>,LCOSD1=<number>,
LCOSD2=<number>,SPROT="SBDSS1",FPROT="SBDSS1",
DPROT="SBDSS1",SOPTIDX=2,FOPTIDX=4,DOPTIDX=4;
```

10.30.1.2 Option Table

The option table comprises a sequence of hexadecimal numbers, which are used in part as a switch function and partly for configuring parameters for features such as CCBS and UUS.

Byte/ Bit	7	6	5	4	3	2	1	0	Comment
1	1	0	0	1	0	1	1	1	Must not be modified

Byte/ Bit	7	6	5	4	3	2	1	0	Comment
2	0	1	1	0	0	0	0	1	Must not be modified Bit 2: Use of UUS3 without explicit activation (CMI extension line only) Bit 5: Allow suffix dialing Bit 6: Allow override stimulus
3	0	1	1	0	0	0	0	0	Bit 4 set: Only AOC-E with activated call data recording Bit 5 set: CCBS is possible Bit 6 set: TP exclusively with basic rate access Bit 7 set: Network-wide signaling that the subscriber is using a functional terminal
4	0	0	0	0	0	0	0	0	Reserve
...									
7	$0A-$83								Maximum length of a UUS information element
42	$10-$FF								UUS burst parameter (default = $10)
43	$08-$FF								UUS incrementation parameter (default = $08)

All other fields in the option table must not be changed as otherwise functionality can no longer be guaranteed to be protocol compliant.

The next table contains the option table assigned accordingly to the respective terminals:

Terminal	Protocol variants	Option table
EURO-ISDN terminal from KRONE	SBDSS1	10
Integrated terminal adapter	SBDSS1	10
ISDN S0PP-PNT (PC cards with layer 2 structure - UDAT REQ)	SBDSS1	10
CMI	SBDSS1	10
NI - BRI terminals	SBNIBRI	7
DSS1 terminal (EURO-ISDN terminals)	SBDSS1	10
DSS1 terminal (functional voice terminals)	SBDSS1	10

- Assigning an option index to the terminal

  A specific option index (1-10) is assigned to the functional terminals on the bus for each service represented, using AMO SBCSU (see table); the index refers to the corresponding option in the database

  ```
  AD-SBCSU:STNO=4711,OPTIDX=<FBUS/MBUS,OPTI/OPTIEXP>,
  ... ,SOPTIDX=<opt-speech>,TOPTIDX=<opt-ttx>,
  VOPTIDX=<opt-vtx>,FOPTIDX=<opt-fax>,
  DOPTIDX=<opt-dte>;
  ```

  or in the case of point-to-point connections:

  ```
  AD-SBCSU:STNO=4711,OPT=<FPP/MSN>,OPTIDX=<opt>;
  ```

  IMPORTANT: If no xOPTIDX (x=S/T/V/F/D) or OPTIDX value is specified when a functional terminal is configured, the AMO enters xOPTIDX=1 or OPTIDX=1 automatically.

  Subsequent modification of an option

  If the option table is definitely loaded (CHA-ZAND:TYPE=OPTTBL) and there are still problems with EURO-ISDN features, it may be necessary to modify a particular option in the database.

  Each option consists of 100 bytes and can be modified in the database on a byte basis using AMO ZAND. For this purpose the option must be addressed by way of the table index 1-10 and the number of the byte to be modified (1-100). The new value assigned to the byte must be in hexadecimal form. Each option also has a name; this too can be modified:

  ```
  CHA-ZAND:TYPE=OPTTBL,IDX=number,BYTE=number,
  VALUEOPT=FF[,NAME="..."];
  ```

  IMPORTANT: Since the meanings of the individual bytes are known only to CP, modification of an option must be carried out by specialists (apart fom the change of name). It is therefore advisable to consult with CP Munich beforehand. If a new HD option table is incorporated (e.g. change of APS), it must be loaded into the database again by means of AMO ZAND. Since the AMO requires this to be done in its entirety (the selective reloading of specific options is not possible), all options are overwritten in the database and any previous modifications are lost.

  IMPORTANT: If the SBDSS1 protocol is required for FPP with layer 2 structure, option table 10 must be used with the following change (`CH-ZAND:TYPE=OPTTBL,IDX=10,BYTE=2,VALUEOPT=E1;`). It must be ensured however that only the S0PP connections (PNT) then use this option table.

10.30.1.3 Station class of service

The possible classes of service are shown in the next table:

COS	DSS1 LM	Default	Comment
CCBS	CCBS	set	The calling subscriber can activate a functional callback if the line is busy; n.b.: Bit 5 of byte 3 must be set in the option table
COLR	COLR	set	The called subscriber line can temporarily suppress the display of its own phone number to the calling party (controlled by terminal)
CW	CW	set	The called subscriber has call waiting class of service
FGAUT	MCID		This class of service must be set together with the MCIDM class of service so that all incoming calls can be registered automatically. Additional manual registration is not possible.
GEP, GESP, GEBINT	AOC		Call charge information is output on the terminal
MCIDA	MCID		Automatic registration of ringing malfunctions; the calling subscribers disconnect before the call is connected
MCIDM	MCID		Manually activated registration of call data during the call or following disconnection
MSN	MSN	set	Multiple Subscriber Number;only for functional terminals
MULTRA	-	set	Only for functional terminals
OVCAT	COLR		The phone number of the called subscriber is also output on the terminal for a secret number
SPECAR	CLIP/ COLP		Only activate if the phone number configured on the terminal is not to be checked
SUBCAL	SUB		Called subscriber is informed of the phone number of the calling subscriber by means of subaddressing
SUBDB	SUB		The called subscriber is notified of own phone number by means of subaddressing
SUBMSN	SUB		The called subscriber is notified of MSN number by means of subaddressing
TP	TP	set	The subscriber can park a call for the maximum duration of two minutes in an active call state

COS	DSS1 LM	Default	Comment
UUS1IM	UUS	set	Class of service for using the UUS1 service is implicit
UUS3	UUS		Class of service for using the UUS3 service

10.30.2 Additional Services

10.30.2.1 Multiple Subscriber Numbers (MSN) on the S0 Bus

With the Multiple Subscriber Numbers (MSN) feature a terminal interface can be assigned several (not necessarily consecutive) subscriber numbers. It is thus possible to select a specific terminal from several belonging to the same service and linked to the same S0 bus.

The bus terminology introduced with AMO SBCSU is used in the following:

- **Main Subscriber Number**

  The main subscriber number in a bus configuration is the number assigned to the physical LINE of the bus. The bus is configured with this subscriber number.
- **Secondary Subscriber Number**

  The secondary subscriber numbers in a bus configuration are additional numbers, under which CorNet terminals can be configured.

  The bus constellation, functional bus (FBUS) as well as an UP0/E connection with functional terminal can be extended such that an existing functional terminal on the main subscriber number or the secondary subscriber number can be reached via several phone numbers. In contrast to the number conversion with AMO TGER, the phone number dialed by the A station is displayed to the B station. Furthermore, additional functional terminals for a service already configured on this port can be connected and reached under a separate phone number. The previously used bus terminology has to be extended in this case by the term secondary MSN number and MSN phone number.
- **Secondary MSN Numbers**

  The effective range of an existing secondary subscriber number is extended to the existing functional non-voice terminal for the main subscriber number or secondary subscriber number. In other words, the NV-FUNCT terminals for the main/secondary subscriber number can now also be reached via the secondary MSN number if it is configured accordingly. Other FUNCT terminals for the same service that are connected to the bus can be reached selectively with the secondary MSN number. Secondary MSN numbers can occur at the UP0/E port. Secondary MSN numbers can occur at the UP0/E port. Since the first "MSN device" on a secondary MSN number occupies a TSI, the number of secondary MSN numbers on the bus is restricted.

IMPORTANT: In UP0/E- configurations, functional terminals can also be assigned to secondary subscriber numbers.

The main subscriber number can then be assigned MSN functionality, and thus becomes a "secondary MSN number".

- **MSN Numbers**

  These are further numbers for functional terminals. All the services for which a functional terminal is configured under the main subscriber number can be accessed under an MSN number. Accordingly, MSN numbers are used in MBUS, FBUS, and UP0/E- configurations. There are no restrictions regarding the number of MSN numbers on the bus.

10.30.2.1.1 Configuration

- MSN on UP0/E port

  Precondition: UP0/E port with secondary subscriber number and at least one functional terminal linked to the main subscriber number, e.g.

Main subscr. no. 4711:	CORNET-TS (Voice terminal),	FUNCT-FAX,	FUNCT-DEE
Secondary sub. no 4712:	CORNET-TS (Voice terminal),		

  Assigning secondary MSN number 4712:
  `AD-SBCSU:STNO=4712,OPTIDX=MSN,MAINO=4711;`

  Result:

	Main subscr. no. 4711:	CORNET-TS (Voice terminal),	FUNKT-FAX,	FUNKT-DEE
MSN	Secondary sub. no 4712:	CORNET-TS (Voice terminal),	MSN-FAX,	MSN-DEE

  The secondary MSN number 4712 occupies 1 TSI for the CorNet-TS terminal and one for all "MSN devices", regardless of how many services can actually be reached. Other secondary MSN numbers can no longer be configured. However, additional MSN subscriber numbers can be configured.

  IMPORTANT: Secondary MSN numbers are always READY and cannot be configured by dependability (DEP) or by AMO DSSU. The scope of MSN services is always the same as the services provided by the functional terminals linked to the main subcriber number (in this case fax and videotex) and cannot be limited to specific services (e.g. fax only). The scope of MSN services is expanded automatically (with each secondary MSN number on the bus) when new functional terminals are added to the main subscriber number (AD-SBCSU: OPTIDX=SVC,..;) ! The scope of MSN services is reduced automatically (with each secondary MSN number on the bus) when functional terminals are deleted at the main

subscriber number (DEL-SBCSU:SVC=<VTX/DTE/FAX/TTX, ...;) !

Assigning an MSN Number (MBUS)

Precondition: Free subscriber number (defined as DAR=STN in AMO WABE) and MBUS with at least one functional terminal linked to the main subscriber number, e.g.

	Main subscr. no. 4711	CORNET-TS (Voice terminal),	FUNCT-FAX,	FUNCT-DEE
MSN	Secondary sub. no. 4712	CORNET-TS (Voice terminal),	MSN-FAX,	MSN-DEE
	Secondary sub. no. 4713		MSN-FAX	MSN-DEE

Assigning MSN number 4999:
`AD-SBCSU:STNO=4999,OPTIDX=MSN,MAINO=4711;`

Result:

	Main subscr. no. 4711	CORNET-TS (Voice terminal),	FUNKT-FAX,	FUNKT-DEE
MSN	Secondary sub. no. 4712	CORNET-TS (Voice terminal),	MSN-FAX,	MSN-DEE
MSN	Secondary sub. no. 4713		MSN-FAX	MSN-DEE

IMPORTANT: MSN numbers are alway READY and cannot be configured by dependability (DEP) or by AMO DSSU. The scope of MSN services is always the same as the services provided by the terminals linked to the main subscriber number (in this case fax and videotex) and cannot be limited to specific services (e.g. fax only). The scope of services is expanded automatically (with each MSN number on the bus) when functional terminals are deleted at the main subscriber number (AD-SBCSU:OPTIDX=SVC, ...;) ! The scope of MSN services is reduced automatically (with each MSN number on the bus) when functional terminals are deleted at the main

subscriber number (DEL-SBCSU:SVC=<VTX/DTE/FAX/TTX>, ...;) !

Assigning an MSN Number (FBUS)

Precondition: Free subscriber number (defined as DAR=STN in AMO WABE) and FBUS with at least one functional terminal linked to the main subscriber number, e.g.

	Main subscr. no. 5711:	FUNCT-Voice,	FUNCT-FAX,	FUNCT-DEE

Assigning MSN number 5999:
`AD-SBCSU:STNO=5999,OPTIDX=MSN,MAINO=5711;`

Result:

	Main subscr. no. 5711:	FUNCT-Voice,	FUNCT-FAX,	FUNCT-DEE
MSN	MSN no. 5999:	MSN-Voice,	MSN-FAX,	MSN-DEE

IMPORTANT: The informamtion contained in the section "Assigning an MSN number (MBUS)" applies accordingly.

- Setting MSN Authorization

  The MSN authorization must be set in the associated COS for the main subscriber number on the bus, depending on the services involved.
  `CHA-COSSU:TYPE=COS,COS=<number>,AVCE=MSN,AFAX=MSN,AVTX=MSN,ADTE=MSN;`

  or in the MBUS examples
  `CHA-COSSU:TYPE=COS,COS=<number>,AFAX=MSN,AVTX=MSN;`

  This class of service has two major effects:

  1) A CP bit which has been set according to the service (this normally preven two funcional bus terminals of the same service being in the call state simultaneously) is disregarded, so that the main subscriber number and the MSN number can be accessed parallel to each other (even without the MSN number on the bus it is possible to ensure, by means of a set MSN class of service, that of two functional voice devices, both set to the main subscriber number, the second can be accessed with the main subscriber number if the first is busy).

  – On an incoming call, the (MSN) number is sent as "Called Party No" to the bus, where each functional terminal itself checks, on the basis of the programmed number(s), whether it has to answer (in the 1TR6 protocol this is the equivalent of the TSI).

  IMPORTANT: It is advisable to set the MSN authorization for all services and not just for those which are actually available - this saves repeated adaptation if the main subscriber number is subsequently expanded with the

addition of other (functional) services and has no negative effects (apart from those referred to above) if there is in fact no "MSN device" for a particular service.

Programming terminal to MSN number

Functional terminals already connected to the bus can also be programmed to the MSN number. In addition, further terminals belonging to the same service can be connected to the bus and programmed to the new MSN number.

IMPORTANT: In the case of terminals connected to the bus with the 1TR6 protocol only a single-digit terminal selection identifier (TSI) can be programmed, with the result that MSN numbers can only be differentiated on the basis of the final digit. It is therefore important for all MSN numbers used on the bus to have different final digits.

10.30.2.2 Deleting of an Configuration

- Secondary MSN number (FBUS, UP0/E port)

	Main subscr. no. 4711	CORNET-TS (Voice terminal),	FUNCT-FAX,	FUNCT-DEE
MSN	Secondary no. 4712	CORNET-TS (Voice terminal),	MSN-FAX,	MSN-DEE
MSN	MSN no. 4999:		MSN-FAX	MSN-DEE

Delection of secondary MSN number 4712:
`DEL-SBCSU:STNO=4712,SVC=MSN;`

Result:

	Main subscr. no. 4711	CORNET-TS (Voice terminal),	FUNCT-FAX,	FUNCT-DEE
	Secondary no. 4712	CORNET-TS (Voice terminal),		
MSN	MSN no. 4999:		MSN-FAX	MSN-DEE

IMPORTANT: Secondary MSN numbers are always "READY" and cannot be activated either by dependability (DEP) or the AMO DSSU so that the usual disconnect before deletion is obsolete. A secondary MSN number cannot be deleted if it is still contained in a hunt group for a service from the MSN services range (i.e. FAX or DEE in the example). All secondary MSN numbers on the bus are deleted automatically by the AMO if you delete the last functional terminal (DEL-SBCSU:SERVICE=<DEE/FAX>, ...;) ! If you cannot delete a secondary MSN number for whatever reason, you also cannot delete the last functional terminal!

- Deleting an MSN subscriber number (FBUS, UP0/E port)

	Main subscr. no. 4711:	CORNET-TS (Voice terminal),	FUNKT-FAX,	FUNKT-DEE
	Secondary subscr. no. 4712:	CORNET-TS (Voice terminal),		
MSN	MSN no. 4999:		MSN-FAX	

Deletion of MSN number 4999:

Result:
`DEL-SBCSU:STNO=4999,SVC=MSN;`

	Main subscr. no. 4711:	CORNET-TS (Voice terminal),	FUNKT-FAX,	FUNKT-DEE
	Secondary susbcr. no. 4712:	CORNET-TS (Voice terminal),		

10.30.2.2.1 Displaying an MSN Number of an S0 Bus

MSN numbers/secondary MSN numbers can only be interrogated in one of the following two ways:
`CHA-SBCSU:TYPE=BUS, ...;`

also displays "MSN" devices"
`CHA-SBCSU:TYPE=DEV,DEV=MSN, ...;`

displays all MSN numbers/secondary MSN numbers assigned by AMO SBCSU

10.30.3 Subaddressing (SUB)>

Subaddressing enables users to extend the addressing capacity beyond the ISDN number. The subaddress can be used, for example, for:

- the additional selection of terminals
- the activation of special processes in the called terminal.

The subaddress (if outdialed by the A subscriber) is transmitted transparently to the called party. The maximum length of a subaddress is 23 octets. This length can be changed to any value between 0 and 23 (default=23) on the terminal side by means of AMO ZAND (see below). At the NW interface this value is permanently assigned to a protocol variant.

Classes of service SUBCAL, SUBDB and SUBMSN

There are 3 alternative authorizations per service for EURO-ISDN terminals. By means of these authorizations, the provision of the ISDN subaddress is controlled for those cases in which the B subscriber definitely expects an ISDN subaddress but this address is not supplied by the A subscriber.

- SUBCAL: B is provided with the A number as the subaddress
- SUBMSN: B is provided with the MSN (Multiple Subscriber Number) as the subaddress (either the number dialed by A or a call forwarding number)

- SUBDB : B is provided with the default B number (main subscriber number) as the subaddress

One of these authorizations must be set in the COS assigned to the EURO-ISDN terminal on a service-specific basis:

```
CHA-COSSU:TYPE=COS,COS=<number>,AVCE=SUBCAL,
AFAX=SUBCAL,ATTX=SUBCAL,AVTX=SUBCAL,ADTE=SUBCAL;
```

IMPORTANT: Since the SUB authorizations are mutually exclusive, only one of these values may be set per COS and service. If several are specified, the first authorization set in the order indicated above is authomatically given precedence.

10.30.3.1 Malicious Call Identification

see Chapter 115, "Malicious Call Identification"

10.30.3.2 User-to-User Signalling (UUS)

see Chapter 150, "User-to-User Service"

10.30.3.3 Terminal Portability

The "Terminal Portability" feature allows a call to be parked temporarily. The call is parked in the node by specifying a two-position identification number. As long as the call is not unparked again, the subscriber can continue to replace or decouple terminals or resume the call from another terminal on the bus by specifying the identification number.

A call can only be parked for a duration of two minutes.

- Configuration

  The TP parameter for the voice service has to be activated in the COS and bit 6 in byte 3 of the assigned option table must be set.
- Restriction

  If the subscriber is a member of a call pickup group, the call can no longer be parked in the pickup group. However, a parked call can be transferred from the pickup group.

10.30.3.4 Call Waiting

If the called subscriber is busy or if all B channels are busy, the subscriber can be informed of the new call if the CW class of service is defined.

10.30.3.5 Call Completion Busy Subscriber

A calling subscriber can activate a functional callback if the line is busy. The CCBS class of service must be set in the COS for this purpose. Bit 5 of byte 3 must be set additionally in the option table.

10.30.3.6 COLR

If the COS class of service COLR of the called subscriber is defined, the call number suppression set in the terminal is evaluated and forwarded to the calling station.

10.30.3.7 Advice of Charge

If call charge recording is activated, the option table can be used to define whether AOC-D and AOC-E or only AOC-E is activated.

If bit 4 of byte 3 is active in the option table, AOC-D is blocked.

10.31 Executive Features

The key function is enhanced by several new trading executive functions. This means that the network-wide teams can now be set up with the same functions as for local teams. Features that are familiar from the CHESE can now be used over the entire network.

10.31.1 Features

10.31.1.1 DSS lines

- The number of DSS destinations that can be programmed is increased to 65 in the ZAND.
- The new function is available network-wide and should be set up with a separate name.
- Calls using DSS keys can always be signaled, even when the called station is busy.

10.31.1.2 Mailboxes per line

- Up to 29 mailbox lines can be configured for each station.
- Each mailbox line has a trunk key assigned to it in the ZIELN.

10.31.1.3 Entry without tone

- The BUZZ key can be pressed to invite a person listening to the call to join in.
- A special authorization (SDAT) prevents the conference tone from being played.

10.31.1.4 Ring transfer

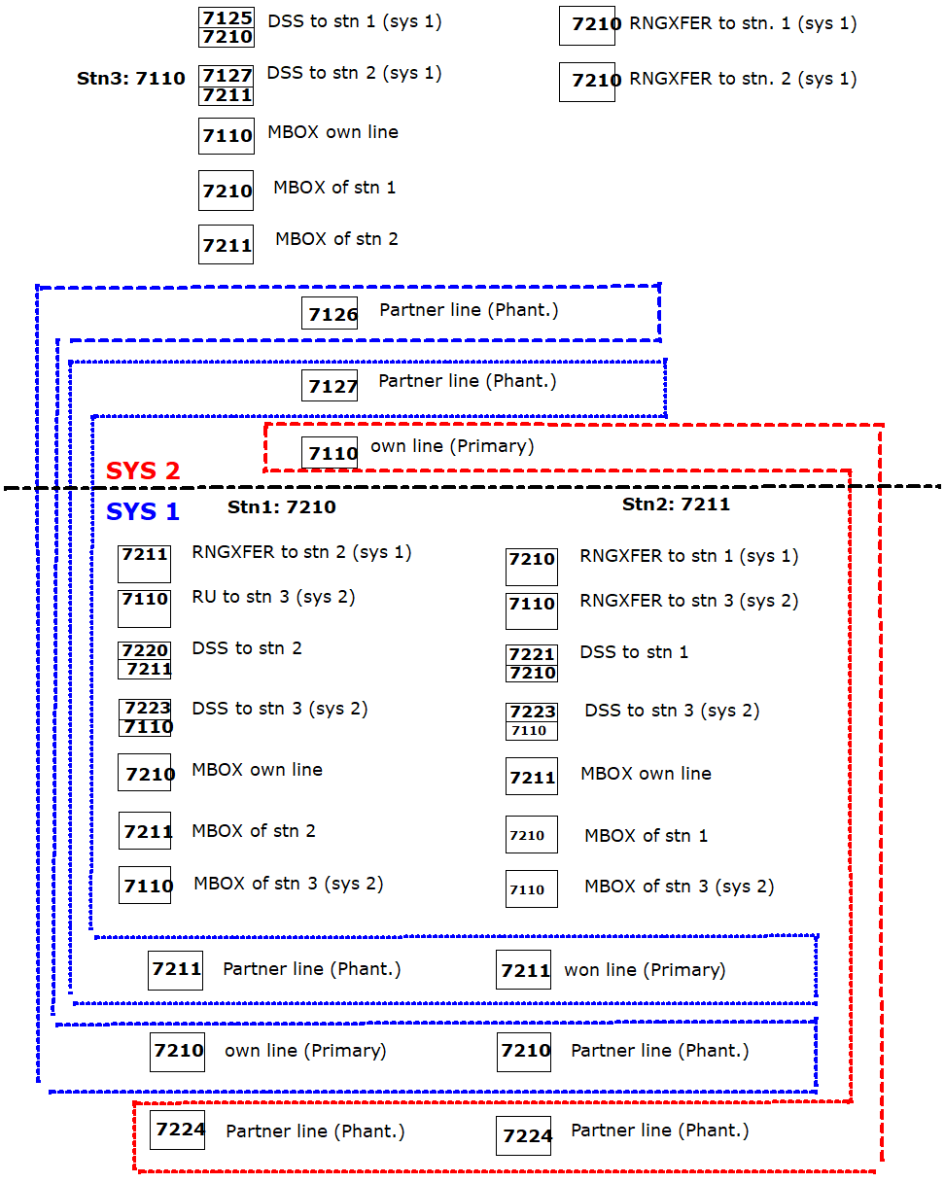
- Call ringing can now be transferred while still displaying the visual signal on the telephone (function as in CHESE).
- Up to 16 ring transfer keys can be configured on each telephone.

10.31.1.5 Redial destinations for trunks used

- The redial key can now store a destination for each trunk key. The station is given a special authorization in AMO SDAT.

10.31.2 Example: Configuration over two Nodes

- Stations 7210 and 7211 are configured in node 30-200
- Station 7110 is configured in node 30-100.
- These three stations form a team.



- Node 200

  Configure KYPROG

  ```
  CHANGE-TAPRO:STD=127,DIGTYP=OPTIT19,KY01=MENU,KY02=SNR,
  KY03=CALLOG,KY04=SPKR,KY05=RNGXFERL,KY06=MBLINE,KY07=LINE,
  KY08=BUZZ,KY09=RNGXFERL,KY10=MBLINE,KY11=LINE,KY12=LINE,
  KY13=RNGXFERL,KY14=MBLINE,KY15=LINE,KY16=LINE,KY17=RCUTOFF,
  KY18=MONSNLTL,KY19=RLS,INFO="KEY - EXECUTIVE TI";
  ```

  Station

  ```
  ADD-SBCSU:STNO=7210,OPT=OPTI,CONN=DIR,PEN=1-2-31-6,
  DVCFIG=OPTIP500,COS1=13,COS2=1,LCOSV1=5,LCOSV2=1,
  LCOSD1=5,LCOSD2=1,DPLN=0,ITR=0,REP=0,STD=127,
  TEXTSEL=GERMAN,CALLOG=ALL;

  ADD-SBCSU:STNO=7211,OPT=OPTI,CONN=DIR,PEN=1-2-31-7,
  DVCFIG=OPTIP500,COS1=13,COS2=1,LCOSV1=5,LCOSV2=1,
  ```

```
LCOSD1=5,LCOSD2=1,DPLN=0,ITR=0,REP=0,STD=127,
TEXTSEL=GERMAN,CALLOG=ALL;
```

Phantom station

```
ADD-SBCSU:STNO=7220&&7224,OPT=OPTI,CONN=DIR,
DVCFIG=OPTIP500,COS1=13,COS2=1,LCOSV1=5,LCOSV2=1,
LCOSD1=5,LCOSD2=1,STD=127, INS=SIGNOFF;
```

Configure KEY

– primary

```
ADD-KCSU:STNO=7210,TYPE=PRIM,PRIMKEY=5,RIOP=YES,
ORLNPF=PRIME,TMLNPF=ALER,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;

ADD-KCSU:STNO=7211,TYPE=PRIM,PRIMKEY=5,RIOP=YES,
ORLNPF=PRIME,TMLNPF=ALER,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;

ADD-KCSU:STNO=7220,TYPE=PRIM,PRIMKEY=5,RIOP=YES,
ORLNPF=PRIME,TMLNPF=ALER,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;

ADD-KCSU:STNO=7221,TYPE=PRIM,PRIMKEY=5,RIOP=YES,
ORLNPF=PRIME,TMLNPF=ALER,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;

ADD-KCSU:STNO=7222,TYPE=PRIM,PRIMKEY=5,RIOP=YES,
ORLNPF=PRIME,TMLNPF=ALER,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;

ADD-KCSU:STNO=7223,TYPE=PRIM,PRIMKEY=5,RIOP=YES,
ORLNPF=PRIME,TMLNPF=ALER,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;

ADD-KCSU:STNO=7224,TYPE=PRIM,PRIMKEY=5,RIOP=YES,
ORLNPF=PRIME,TMLNPF=ALER,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;
```

– secondary

```
EINR-KCSU:TLNNU=7210,TYP=SEK,TASNU=11,TLNNUSEK=7211,
RUFOP=JA,AUTOANT=NEIN,DRLEITNG=XX;

EINR-KCSU:TLNNU=7210,TYP=SEK,TASNU=15,TLNNUSEK=7224,
RUFOP=JA,AUTOANT=NEIN,DRLEITNG=XX;

EINR-KCSU:TLNNU=7211,TYP=SEK,TASNU=11,TLNNUSEK=7210,
RUFOP=JA,AUTOANT=NEIN,DRLEITNG=XX;

EINR-KCSU:TLNNU=7211,TYP=SEK,TASNU=15,TLNNUSEK=7224,
RUFOP=JA,AUTOANT=NEIN,DRLEITNG=XX;

EINR-KCSU:TLNNU=7210,TYP=SEK,TASNU=08,TLNNUSEK=7220,
RUFOP=JA,AUTOANT=NEIN,DRLEITNG=XX;
```

```
EINR-KCSU:TLNNU=7210,TYP=SEK,TASNU=12,TLNNUSEK=7223,
RUFOP=JA,AUTOANT=NEIN,DRLEITNG=XX;

EINR-KCSU:TLNNU=7211,TYP=SEK,TASNU=08,TLNNUSEK=7221,
RUFOP=JA,AUTOANT=NEIN,DRLEITNG=XX;

EINR-KCSU:TLNNU=7211,TYP=SEK,TASNU=12,TLNNUSEK=7223,
RUFOP=JA,AUTOANT=NEIN,DRLEITNG=XX;
```

Release hotline

```
CHANGE-FEASU:TYPE=A,CM=HOTRCL;
```

Set up HOT destination

```
ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=1,DEST=7210;

ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=2,DEST=7211;

ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=3,DEST=7110;
```

Set up HOT authorization

```
CHANGE-COSSU:TYPE=COS,COS=1&13,AVCE=HOT;
```

Set up hot index on station

```
CHANGE-SDAT:STNO=7220,TYPE=DATA1,HOTIDX=2;

CHANGE-SDAT:STNO=7221,TYPE=DATA1,HOTIDX=1;

CHANGE-SDAT:STNO=7223,TYPE=DATA1,HOTIDX=3;
```

Set up mailbox for trunk

```
EINR-ZIELN:TLNNU=7210,TYP=BKLEITNG,TASNU=06,RNRBK=7210;

EINR-ZIELN:TLNNU=7210,TYP=BKLEITNG,TASNU=10,RNRBK=7220;

EINR-ZIELN:TLNNU=7210,TYP=BKLEITNG,TASNU=14,RNRBK=7110;

EINR-ZIELN:TLNNU=7211,TYP=BKLEITNG,TASNU=06,RNRBK=7211;

EINR-ZIELN:TLNNU=7211,TYP=BKLEITNG,TASNU=10,RNRBK=7210;

EINR-ZIELN:TLNNU=7211,TYP=BKLEITNG,TASNU=14,RNRBK=7110;
```

Assign additional rights (RNGXFER, DSS, SNR and monitoring)

```
CHANGE-SDAT:STNO=7210,TYPE=ATTRIBUT,
AATTR=SNRLINE&DSSLINE&RNGXFERL&MONSNLTL;

CHANGE-SDAT:STNO=7211,TYPE=ATTRIBUT,
AATTR=SNRLINE&DSSLINE&RNGXFERL&MONSNLTL;

CHANGE-SDAT:STNO=7220,TYPE=ATTRIBUT,
AATTR=DSSLINE&RNGXFERL&MONSNLTL;

CHANGE-SDAT:STNO=7221,TYPE=ATTRIBUT,
AATTR=DSSLINE&RNGXFERL&MITHOERL;
```

```
CHANGE-SDAT:STNO=7222,TYPE=ATTRIBUT,
AATTR=DSSLINE&RNGXFERL&MONSNLTL;

CHANGE-SDAT:STNO=7223,TYPE=ATTRIBUT,
AATTR=DSSLINE&RNGXFERL&MONSNLTL;

CHANGE-SDAT:STNO=7224,TYPE=ATTRIBUT,
AATTR=SNRLINE&DSSLINE&RNGXFERL&MONSNLTL;
```

Set up RNGXFER on station

```
EINR-ZIELN:TLNNU=7210,TYP=RULEITNG,TASNU=5,
RNRRU=7210,RUFUNKT=XXX;

EINR-ZIELN:TLNNU=7210,TYP=RULEITNG,TASNU=9,
RNRRU=7210,RUFUNKT=XXX;

EINR-ZIELN:TLNNU=7211,TYP=RULEITNG,TASNU=5,
RNRRU=7211,RUFUNKT=XXX;

EINR-ZIELN:TLNNU=7211,TYP=RULEITNG,TASNU=9,
RNRRU=7211,RUFUNKT=XXX;
```

- **Node 100**

  Configure KYPROG

  ```
  CHANGE-TAPRO:STD=127,DIGTYP=OPTIT19,KY01=MENU,KY02=SNR,
  KY03=CALLOG,KY04=SPKR,KY05=RNGXFERL,KY06=MBLINE,KY07=LINE,
  KY08=BUZZ,KY09=RNGXFERL,KY10=MBLINE,KY11=LINE,KY12=LINE,
  KY13=RNGXFERL,KY14=MBLINE,KY15=LINE,KY16=LINE,KY17=RCUTOFF,
  KY18=MONSLNTL,KY19=RLS,INFO="KEY - EXECUTIVE TI";
  ```

  Configure station

  ```
  ADD-SBCSU:STNO=7110,OPT=OPTI,CONN=DIR,PEN=1-1-49-6,
  DVCFIG=OPTIP500,COS1=13,COS2=1,LCOSV1=5,LCOSV2=1,LCOSD1=5,
  LCOSD2=1,DPLN=0,ITR=0,REP=0,STD=127,TEXTSEL=GERMAN,CALLOG=ALL;
  ```

  Phantom station

  ```
  ADD-
  SBCSU:STNO=7125&&7288,OPT=OPTI,CONN=DIR,DVCFIG=OPTIP500,
  COS1=13,COS2=1,LCOSV1=5,LCOSV2=1,LCOSD1=5,LCOSD2=1,STD=127,
  INS=SIGNOFF;
  ```

  Configure KEY

  – primary

  ```
  ADD-KCSU:STNO=7110,TYPE=PRIM,PRIMKEY=7,RIOP=YES,
  ORLNPF=PRIME,TMLNPF=ALER,BUSYRING=ALERT,APRIVAT=NO,
  AICS=NO;

  ADD-KCSU:STNO=7125,TYPE=PRIM,PRIMKEY=7,RIOP=YES,
  ORLNPF=PRIME,TMLNPF=ALER,BUSYRING=ALERT,APRIVAT=NO,
  AICS=NO;

  ADD-KCSU:STNO=7126,TYPE=PRIM,PRIMKEY=7,RIOP=YES,
  ORLNPF=PRIME,TMLNPF=ALER,BUSYRING=ALERT,APRIVAT=NO,
  AICS=NO;
  ```

```
ADD-KCSU:STNO=7127,TYPE=PRIM,PRIMKEY=7,RIOP=YES,
ORLNPF=PRIME,TMLNPF=ALER,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;

ADD-KCSU:STNO=7128,TYPE=PRIM,PRIMKEY=7,RIOP=YES,
ORLNPF=PRIME,TMLNPF=ALER,BUSYRING=ALERT,APRIVAT=NO,
AICS=NO;
```

– secondary

```
EINR-KCSU:TLNNU=7110,TYP=SEK,TASNU=12,TLNNUSEK=7125,
RUFOP=JA,AUTOANT=NEIN,DRLEITNG=XX;

EINR-KCSU:TLNNU=7110,TYP=SEK,TASNU=11,TLNNUSEK=7126,
RUFOP=JA,AUTOANT=NEIN,DRLEITNG=XX;

EINR-KCSU:TLNNU=7110,TYP=SEK,TASNU=16,TLNNUSEK=7127,
RUFOP=JA,AUTOANT=NEIN,DRLEITNG=XX;

EINR-KCSU:TLNNU=7110,TYP=SEK,TASNU=15,TLNNUSEK=7128,
RUFOP=JA,AUTOANT=NEIN,DRLEITNG=XX;
```

Release hotline

```
CHANGE-FEASU:TYPE=A,CM=HOTRCL;
```

Set up HOT destination

```
ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=1,DEST=7210;

ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=2,DEST=7211;
```

Set up HOT authorization

```
CHANGE-COSSU:TYPE=COS,COS=1&13,AVCE=HOT;
```

Set up hot index on station

```
CHANGE-SDAT:STNO=7125,TYPE=DATA1,HOTIDX=1;

CHANGE-SDAT:STNO=7127,TYPE=DATA1,HOTIDX=2;
```

Set up mailbox for trunk

```
EINR-ZIELN:TLNNU=7110,TYP=BKLEITNG,TASNU=06,
RNRBK=7110;
```

Assign additional rights (RNGXFER, DSS, SNR and monitoring)

```
CHANGE-SDAT:STNO=7110,TYPE=ATTRIBUT,
AATTR=SNRLINE&DSSLINE&RNGXFERL&MONSLNTL;

CHANGE-SDAT:STNO=7125,TYPE=ATTRIBUT,
AATTR=DSSLINE&RNGXFERL&MONSLNTL;

CHANGE-SDAT:STNO=7126,TYPE=ATTRIBUT,
AATTR=SNRLINE&DSSLINE&RNGXFERL&MONSLNTL;

CHANGE-SDAT:STNO=7127,TYPE=ATTRIBUT,
AATTR=SNRLINE&DSSLINE&RNGXFERL&MONSLNTL;
```

```
CHANGE-SDAT:STNO=7128,TYPE=ATTRIBUT,
AATTR=DSSLINE&RNGXFERL&MONSLNTL;
```

Set up RNGXFER on station

```
EINR-ZIELN:TLNNU=7110,TYP=RULEITNG,TASNU=5,
RNRRU=7210,RUFUNKT=XXX;

EINR-ZIELN:TLNNU=7226,TYP=RULEITNG,TASNU=9,
RNRRU=7210,RUFUNKT=XXX;

EINR-ZIELN:TLNNU=7227,TYP=RULEITNG,TASNU=5,
RNRRU=7211,RUFUNKT=XXX;
```

10.31.3 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
KCSU	DRLEITNG	d	Direktrufleitung mit Taste beim Direktrufleitungspartner
	DSSLINE	e	dss line with key on dss line partner
SDAT	DRLEITUNG	d	Direkrufleitung
	DSSLINE	e	dss line
	RULEITUNG	d	Rufumschaltung der Leitung erwünscht
	RNGXFERL	e	ring transfer for line desired
	WWLEITUNG	d	WW-Ziel der benutzten Leitung benutzen
	SNRLINE	e	use redail number of used line
	MITHOERL	d	Mithören/Eintreten ohne Ton in Leitung
	MONSLNTL	e	silent monitoring/bridge of line
TAPRO	BKLEITNG	d	Briefkasten für Leitung
	MBLINE	e	mailbox key for line
	RULEITNG	d	Rufabschaltung der Leitungstasten
	RNGXFERL	e	ring transfer (for executive/ secretary) key
	MITHOERL	d	Mithören/eintreten ohne Ton in die Leitung
	MONSLNTL	e	silent monitoring / bridge of line
ZIELN	BKLEITNG	d	Briefkasten für Leitung
	MBLINE	e	mailbox key for line

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	RULEITNG	d	Rufabschaltung der Leitungstasten
	RNGXFERL	e	ring transfer (for executive/ secretary) key
ZAND	DRLEITNG	d	LED Statusanzeige bei Direktrufleitung
	DSSLINE	e	deactivate LED status display at DSS lines

10.32 Flexible optiPoint Display

10.32.1 Feature Description

optiPoint terminals have a one- or two-row display, with 24 characters per row.

With the "flexible Digite display" feature it is possible to change the structure of the station display and also the system's response to an "over-long" station display.

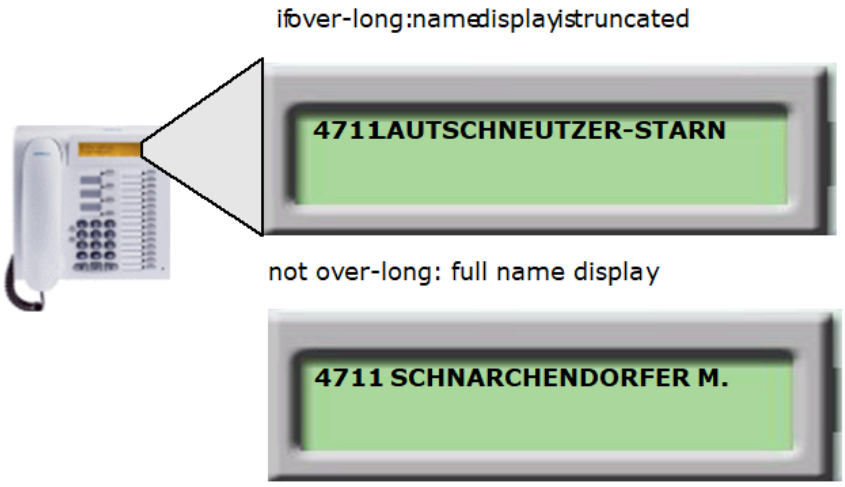
The space between the extension and the name has been reduced from two positions to one and there is no longer a space between the name and the call forwarding signal.

10.32.2 Service Information

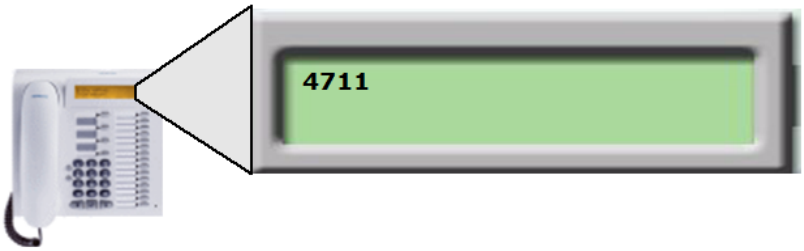
- The * is used to indicate the length of the last name.
- The NAME="LAUTSCHNEUZER-STARNBERGER*SABIN" (max. 31 characters) is stored without the asterisk (*).
- This feature has no effect when the display is idle.

10.32.3 User Interface/Display Formats

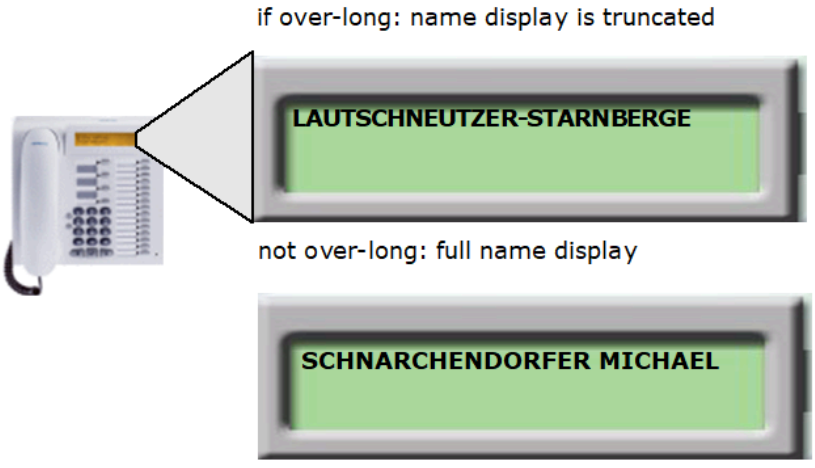
- **MODE1**: Display extension and name
  `CHANGE-ZAND:TYPE=ALLDATA,DISPMODE=MODE1;`



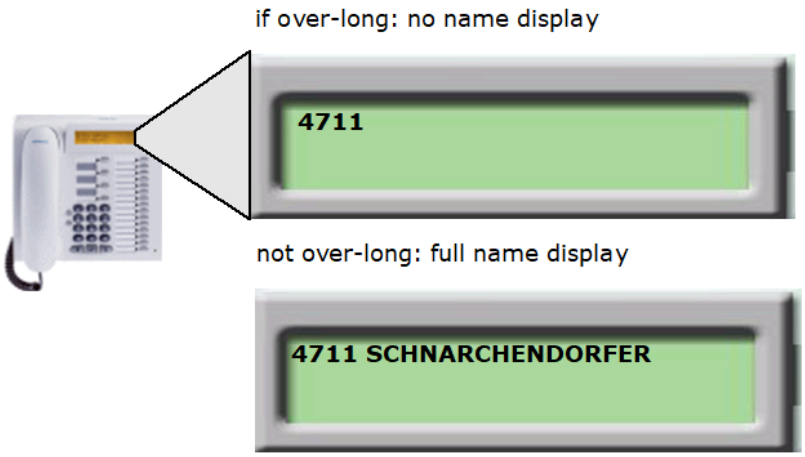
- **MODE2**: Display extension only - no name display (excessive length not possible)
  `CHANGE-ZAND:TYPE=ALLDATA,DISPMODE=MODE2;`



- **MODE3**: No extension display - display name only
  `CHANGE-ZAND:TYPE=ALLDATA,DISPMODE=MODE3;`

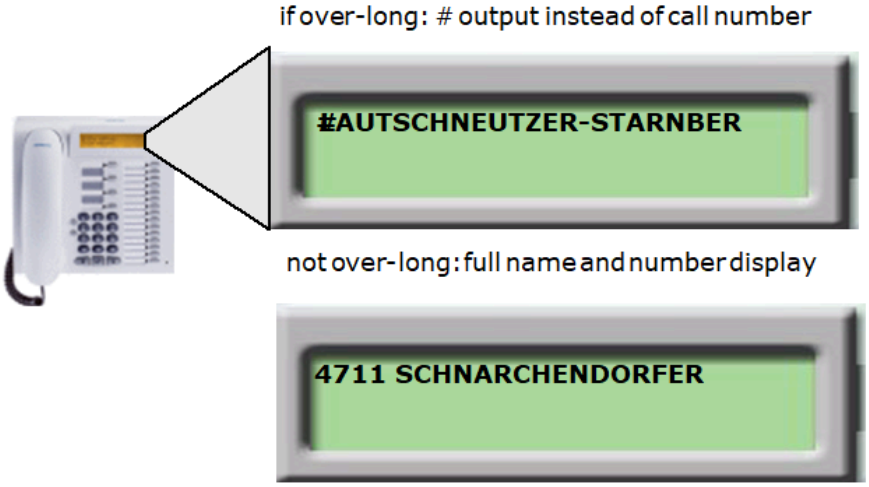


- **MODE4**: Display extension and second name
  CHANGE-ZAND:TYPE=ALLDATA,DISPMODE=MODE4;



- **MODE5**: Display extension and second name

  If over-long: the call number is replaced by the "#" (pound) sign; a shortened name display is also possible
  CHANGE-ZAND:TYPE=ALLDATA,DISPMODE=MODE5;



10.32.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
ZAND	TYP	d	AUSWAHL DES DATENTYPS TYPE=DATENALL
	TYPE	e	DESIRED SYSTEM OPTION TYPE=ALLDATA

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	DISPMODE	d	DISPLAYMODE FUER FLEXIBLE DISPLAYANZEIGE **MODE1**=AUSGABE RUFNUMMER UND NAME, FALLS DISPLAYTEXT ZU LANG: NA... **MODE2**=AUSGABE NUR RUFNUMMER **MODE3**=AUSGABE NUR NAME **MODE4**=AUSGABE RUFNUMMER UND NAME, FALLS DISPLAYTEXT ZU LANG: NU... **MODE5**=AUSGABE RUFNUMMER UND NAME, FALLS DISPLAYTEXT ZU LANG: ST...
	DISPMODE	e	DIGITE DISPLAY MODE **MODE1**=DISPLAY EXTENSION AND NAME **MODE2**=DISPLAY EXTENSION ONLY **MODE3**=DISPLAY NAME ONLY **MODE4**=DISPLAY EXTENSION AND OPTIMIZED NAME **MODE5**=DISPLAY OPTIMIZED EXTENSION AND NAME

10.33 Hotline/Off-Hook Recall

The hotline feature automatically sets up VOICE and DTE connections immediately via initial seizure to a preset destination assigned in the HOTLN AMO.

- Assign memory
  `ADD-DIMSU:TYPE=USER,HOTDEST=<number>;`
- Assign a hotline destination
  `ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=<number>, DEST=<number>;`
- Activate the feature:
  `CHA-FEASU:TYPE=A,CM=HOTRCL;`
- Assign the hotline destination to a station
  `CHA-SDAT:STNO=<number>,TYPE=DATA1, HOTIDX=<number>;`
- Assign the attribute HOT for service voice to a station by either assigning it switchable to a COS of the station (toggling between a COS with attribute HOT and one without HOT is possible - COS1/COS2 of the station):
  `CHA-COSSU:TYPE=COS,COS=<number>, AVCE=HOT; (for VOICE)`

  or assigning it fixed (COS with AVCE=HOT is not necessary in that case):
  `CHA-SDAT:STNO=<number>,TYPE=ATTRIBUT,AATTR=HOT;`
- Assign the attribute HOT for service DTE to a COS of the station (toggling between a COS with attribute OFHKRC and one without OFHKRC):
  `CHA-COSSU:TYPE=COS,COS=<number>,ADTE=HOT;`

  The off-hook recall feature automatically sets up a connection to a preset destination assigned in the HOTLN AMO if either no digits are dialled, or only an incomplete digit sequence is dialled within a preset time. For AnaTe stations, the connection is also set up after time-out of busy tone from A-B

disconnection of one party or after time-out of busy tone after dialing an Out of Service destination. This feature is provided for the VOICE service only.

- Assign memory
  `ADD-DIMSU:TYPE=USER,HOTDEST=<number>;`
- Assign an off-hook recall destination
  `ADD-HOTLN:TYPE=OFRCDEST,HTLNIDX=<number>, DEST=<number>;`
- Activate the feature:
  `CHA-FEASU:TYPE=A,CM=HOTRCL;`
- Change the time for automatic connection setup in AMO DTIM2:

  Digital phones:

  `CHA-DTIM2:TYPEDH=GEN,ANATN1=10;` 10 seconds is default value.

  Analog phones:

  `CHA-DTIM2:TYPEDH=GEN,DTNT1=10;` 10 seconds is default value

  IMPORTANT: The parameter ANATN1 or DTNT1 is also used to configure the dial supervision time (i.e. the maximum time allowed between lifting the handset and dialing a number). If the maximum time allowed is exceeded, "Timeout" appears on the display.

- Assign the off-hook recall destination to a station
  `CHA-SDAT:STNO=<number>,TYPE=DATA1, HOTIDX=<number>;`
- Assign the attribute OFHKRC to a station by either assigning it switchable to a COS of the station (toggling between a COS with attribute OFHKRC and one without OFHKRC is possible - COS1/COS2 of the station):
  `CHA-COSSU:TYPE=COS,COS=<number>, AVCE=OFHKRC;`

  or assigning it fixed (COS with AVCE=OFHKRC is not necessary in that case):
  `CHA-SDAT:STNO=<number>,TYPE=ATTRIBUT, AATTR=OFHKRC;`

10.33.1 Relevante AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
DIMSU	HOTZIEL	d	Speicher für Hotline-, Röchelziel
	HOTZIEL	e	Memory for hotline/offhook destinations
HOTLN	TYP	d	ROEZIEL, HOTZIEL, DATZIEL
	TYPE	e	OFRCDEST, HOTDEST, HOTDEST,
	HTLNIDX	d	gewuenschter hotline index fuer hotline/ offhook ziele

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	HTLNIDX	e	desired hotline index for hotline/offhook destinations
	ZIEL	d	roechelziel
	DEST	e	offhook intercept destination
SDAT	TYP	d	DATEN1
	TYPE	e	DATA1
	HOTIDX	d	hotline index
	HOTIDX	e	hotline index
COSSU	HOT	d	(ESBER/EDBER) hotline
	HOT	e	(AVCE/ADTE) hotline
	ROE	d	(ESBER)
	OFHKRC	e	(AVCE) code blue

10.34 Ignore Call Forwarding

Even subscriber B has activated a call forwarding subscriber A is able to call him.

10.34.1 Feature Description

Subscriber B has activated a call forwarding to subscriber C. If subscriber A dials the access code **FWDIGNOR** and the extension of subscriber B the call forwarding of subscriber B will be ignored. If subsriber B is idle he will be called from subscriber A.

10.34.2 Service Information

This feature is available for subscribers and the attendant console.

This feature is available for a straight outgoing call as well as for a consultation call.

10.34.3 Generation (Example)

AMO WABE, Parameter **FWDIGNOR**

The following steps have to be performed to activate the feature.

1) DEL-WABE for accesscode **FWDIGNOR**

2) CREATE-WABE for accesscode **FWDIGNOR**
3) `EX-UPDAT:BP,ALL;` to save accesscode on harddisc

Now the feature "Ignore Call Forwarding" is activated.

10.34.4 Relevant AMOs

AMO	Parameter	Language	Description
WABE	AULIGNOR	d	Anrufumleitung ignorieren
	FWDIGNOR	e	Ifnore call forwarding

10.35 Malicious Call Identification/Tracing

10.35.1 Feature Description

The "Malicious Call Identification" feature can be used to trace or identify the A-station's call number in a OpenScape 4000/HiPath 4000 network, even if the number is marked as private.

If tracing is performed, the A-station's call number is output as a system message at the operating terminal, for example, and not on the B-station's display.

You can also use this function to identify external callers if MCID evaluation is activated by the carrier and protocol element transfer is guaranteed for MCID.

10.35.2 Service Information

When tracing calls on MFC-R2 trunks, a report is printed out and the line is cleared down once the caller has been traced.

Restrictions

- When both COT parameter **AMFC** and **TRACE=YES** is set in AMO SBCSU, the user must activate there TRACE or DTMF features via the corresponding code WABE.
- MCID call clearing control (MCID after disconnect) is only possible until the station goes on hook. Once the device has entered in idle status, it is no linger possible to invoke MCID.
- Attendant does not support MCID call clearing control (MCID after disconnect)

10.35.3 User Interface

Initiating a trace:

Tracing is started from the standard attendant console by pressing the unmarked key above the night switch key (moon symbol). The COS of the AC must include the **MTRACE** or **ATRACE** parameters.

If you want to trace the A-station from the enhanced attendant console, click the "TOOLS" menu item while a call is in progress and then click "MCID".

You must select the tracing code to activate the MCID feature in a Digite.

Anates differ from Digites in that you must initiate a consultation call in the Anate before you can select the tracing code.

10.35.4 Generation (Example)

General parameters for malicious call identification:

- You must apply to the carrier for the MCID feature before you can trace the A-station in the public network.
- To add a code:
  `ADD-WABE:CD=<code for trace>,DAR=TRACE;`
- Proceed as follows to enable the feature:
  `CHA-FEASU:TYPE=A,CM=TRACE&TRACCO;`
- To configure a trace code as follows:
  `CHA-ZAND:TYPE=ALLDATA,TRCD=<code for trace>;`
- Timer for tracing jobs (multiple timer, default value 50 seconds)
  `CHA-DTIM1:TYPEDH=CO,TRACCO=number;`

  Parameters for the trunk (also required for tie trucks):
- Create a class of parameter for lines to be traced as follows:
  `ADD-COT:PAR=TRAI;`
- Create a class of parameter for lines with initial tracing as follows: (Finland NO2 signaling):
  `ADD-COP:PAR=TRAC;`
- Define the maximum number of simultaneous tracing jobs per trunk group: The TRACENO parameter must be >0.
  `CHA-BUEND:TGRP=<number>,TRACENO=<number>;`

  Parameters for stations:
- Assign trace authorization to the station as follows:
  `CHA-SCSU:STNO=number,COTRACE=YES;`

  or
  `CHA-SBCSU:STNO=number,TRACE=Yes;`

  Parameters for the station or attendant console, for example:
  `CHANGE-COSSU:TYPE=COS,COS=<COS of attendant console>, AVCE=MTRACE;`
  or
  `CHANGE-COSSU:TYPE=COS,COS=<COS of attendant console>, AVCE=MCIDM;`

  or
  `CHANGE-COSSU:TYPE=COS,COS=<COS of attendant console>, AVCE=MCIDA;`
- For MCID call clearing control (MCID after disconnect):

`ADD-COT:PAR=MICC;`

Enhanced attendant console settings

- Deactivate the enhanced attendant console and start the configuration tool.
- Set MCIDEnabled to 1, that is, activate it (or enter in the registry database: "MCIDEnabled"=DWORD:00000001).
- Save and exit the configuration tool, then restart the enhanced attendant console

or see the relevant manual.

10.35.5 Relevant AMOs

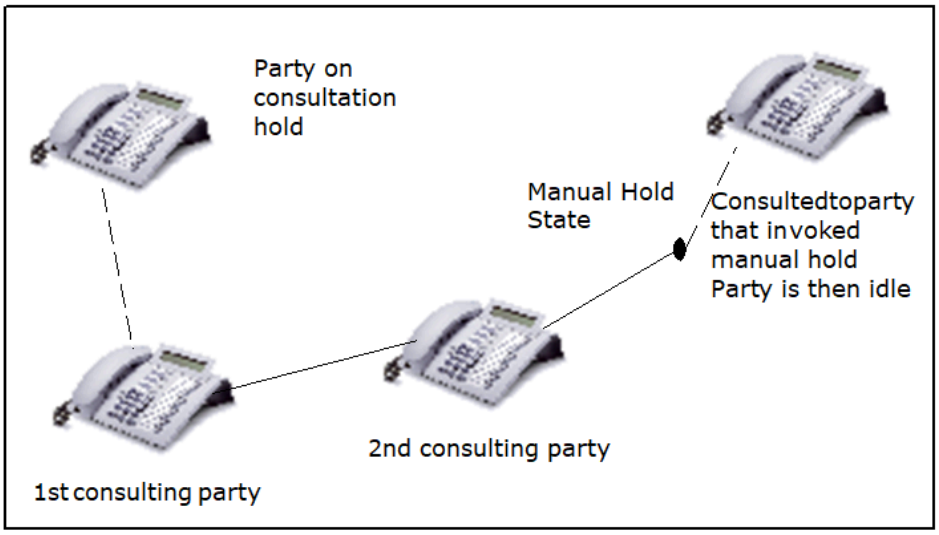
AMO	Parameter	Sprache/ Language	Beschreibung/Description
BUEND	BUNUM	d	Bündelnummer
	TGRP	e	Trunk group number
	ANZFANG	d	Anzahl der Leitungen für Fangen im Bündel (>1)
	TRACENO	e	NUMBER OF LINES IN A TRUNK GROUP USED BY TRAPS (>1)
COSSU	TYP	d	Verzweigungsparameter
	TYPE	e	Desired cossu option
	COS	d	Class-of-Service Nummer fuer Sprache
	COS	e	Class of service number for voice
	ESBER	d	Einfügen Sprachberechtigung MRNRID oder ARNRID
	AVCE	e	Add voice authorization MTRACE or ATRACE
COT	COTNU	d	Class of Trunk (Nummer)
	COTNO	e	Class of Trunk
	COTPAR	d	Parameterwerte für eine Class of Trunk LTGF (Leitung mit Fangen)
	PAR	e	Parameter values of a Class of Trunk TRAI (Malicious call trace)
FEASU	TYP	d	Typ der Verarbeitung
	TYPE	e	desired class mark facility options
	LM	d	Leistungsmerkmal LM=FANGEN bzw. AMTFANG

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	CM	e	feature, class mark, facility CM=TRACE or TRACCO
SBCSU SCSU	TLNNU	d	Teilnehmer-Rufnummer
	STNO	e	Station number
	AMTFANG	d	Fangen eines Amtsgespräches erlaubt (JA)
	TRACE	e	Malicious call trace allowed (YES)
WABE	RNR	d	Rufnummer
	CD	e	Access code
	KZP	d	Kennzahlpunkt (FANGEN)
	DAR	e	Digit analysis result
ZAND	TYP	d	Auswahl des Datentyps
	TYPE	e	Desired system option
	FANGKZ	d	Fangen Kennzahl
	TRCD	e	Call Trace Code

10.36 Manual Hold of Consultation

10.36.1 Overview

This feature will allow a consulted to party to place a call on manual hold. The feature works for both first and second consultation provided the consulted to party does not have a background call at the same time.



10.36.2 User Interface

The consulted to party my invoke manual hold via

- Cons Key
- Dialog Menu

The first Consulting party may

- Toggle
- Transfer
- Release the connection to the party on manual hold
- Release the connection to the party on Consultation hold
- If a second consultation has taken place the first consulting party can release the call to the second consulting party

The second Consulting party may also

- Release the call to the first consulting party

The held party in the first consultation may

- Release the call to the first consulting party

10.36.3 Service Information

The feature "Manual Hold of Consultation" is a pure software feature.

10.37 Multilingual User Interface

10.37.1 Feature Description

Different languages can be configured for display texts per switch.

One of these languages can be defined as priority language for every subscriber.

Additionally, a language selection key can be configured which allows the user to select one of the available language in the switch. By pressing this key the next language configured in the switch is selected. After the language change the selected language is displayed in the new language (e.g. "Sprache: Deutsch", "Language: English").

There are two modes (COS) for the duration of the language change:

- Temporary (dynamic) selection:

  The language selection is valid until the end of the next call.

  Applications: stations frequented by many different users, e.g. , conference rooms, hotel lobbies.
- Static selection:

  The language selection remains valid until changed by the user or the administrator.

  Application: stations used by different users for a longer period of time, e.g. hotel rooms, working places for guests or consultants

10.37.2 Service Information

Note the following relations to other features:

- Team/Chese network wide:

  The available languages must be configured identically in both switches.
- Announcements:

  The user receives the standard announcements independent from the language selected for the displays.
- Autoset Relocate

  If an Up0E moves to a non-multilingual board, the default language becomes the priority language.
- Programming the key layout:

  The user cannot define the language selection key.
- PIN:

  Whether station data of the various PIN types is transferred or not, is defined in the Class of PIN (COPIN). This parameter also defines the transfer of the priority language. If the PIN type is PIN network wide, the priority language is only transmitted between nodes connected via CorNet-NQ.
- Cordless 300E (CMI):

  On cordless stations the default language of the switch is always the priority language. On these stations the language cannot be changed.
- Trading / SKY:

  The default language of the switch is always the priority language for stations configured with Trading and SKY. On these stations the language cannot be changed.

10.37.3 Generation (Example)

This is a default feature and need not be released using CODEW, FEASU AMO.

- Install the list of languages available in the switch (the first language in the list is the default language, in the example German. All stations where no other language was explicitly defined as priority language will use German):

```
CHA-ZAND:TYPE=ALLDATA2,TEXTSEL=GERMAN&ENGLISH&
PORTUG&FINNISCH;
```

- Enter a list of languages for the control of the phone inherent special character tables and for the phone inherent telephone book menu. Make sure that the languages on positions 1 to 5 in both lists match (**LANGID** parameter and **TEXTSEL**). For the above example enter the following:

```
CHA-ZAND:TYPE=OPTISET,LANGID=GERMAN&ENGLISH&
PORTUG&FINNISCH;
```

- To activate the new list containing the available languages save the new data and restart the system:

```
EXEC-UPDAT:UNIT=BP,SUSY=ALL;

EXEC-REST:TYPE=SYSTEM,RSLEVEL=RELOAD;
```

- Change the priority language of a terminal:

```
CHA-SBCSU:STNO=3258,OPT=OPTI,TEXTSEL=GERMAN;
```

- Switch off all other stations before changing the priority language. Change the priority language of a Set 400:

```
DEA-DSSU:OFFTYPE=DI,TYPE=STNO,STNO=3212;
/* Deactivate station

CHA-SCSU:STNO=3212,TEXTSEL=GERMAN;
/* Change priority language

AC-DSSU:ONTYPE=AUL,TYPE=STNO,STNO=3212;
/* Activate station
```

- Define the language selection key for a terminal (key 12 in the following example):

```
CHA-TAPRO:STNO=3256,DIGTYP=OPTISET,KY12=TEXTSEL;
```

- Configure the COS for static or dynamic language selection for the user:

```
CHA-SDAT:STNO=3256,TYPE=ATTRIB,AATTR=TEXTDYN;
/* dynamic selection
```

or

```
CHA-SDAT:STNO=3256,TYPE=ATTRIB,AATTR=TEXTSTAT;   /*
 static
selection
```

10.37.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
SBCSU	TEXTSEL	D	Textselektion (Sprache für die Displayanzeige)
	TEXTSEL	E	Testselection of display language
SDAT	SPRDYN	D	Dynamische Auswahl der Sprache
	LNGDYN	E	Dynamic language select
	SPRSTAT	D	Statische Auswahl der Sprache
	LNGSTAT	E	Static language select
TAPRO	SPRWA	D	Sprachauswahltaste für Displaytexte
	LANSEL	E	Languageselection for Display texts
ZAND	TEXTSEL	D	Textselektoren im System
	TEXTSEL	E	General settings for individual language setting of display texts
ZAND	SPRACHID	D	Nationale Zeichensätze für das Display
	LANGID	E	National character set for display

10.38 Name and Organization to a Number (ORG Assigning)

Each station number can be assigned several names. A name consists of the surname and possibly the first name, which is separated from the surname by a (*). The name which appears on the display is always the first name assigned to the STNO. The organization unit (department) must always be entered together with a name.

- Enter the name and the organization unit:

  ```
  AD-PERSI:TYPE=STN,STNO=number,NAME=string,ORG=string;
  ```
- Change the display name:

  ```
  CHA-PERSI:TYPE=NAME,STNO=number,NEWNAME=string;
  ```
- Change the name:

  ```
  CHA-PERSI:TYPE=NAME,STNO=number,[OLDNAME=string],
  NEWNAME=string;
  ```
- Change the ORGNAME as follows:

  ```
  CHA-PERSI:TYPE=ORGNAME,STNO=number,NAME=string,
  NEWORG=string;
  ```

Call number display for calling parties

- Change the type of call number display for calling parties:

  ```
  CHA-ZAND,TYPE=ALLDATA,DISPMODE=<MODE1 .. MODE5>,
  ```
- Example: Enter a name with a first name (* divides the two names):

  ```
  ADD-PERSI:TYPE=STN,STNO=32857, NAME="DR. V.
   RITTER*MARTIN";
  ```

  Depending on the mode installed, the following is displayed on the device display:

MODE1:->	32857 DR. V. RITTER M.
MODE2:->	32857
MODE3:->	DR. V. RITTER MARTIN
MODE4:->	32857 DR. V. RITTER
MODE5:->	# DR. V. RITTER

10.39 Number Identification

Identification (S0/S2 central office)

For manual and automatic identifications of numbers to CO two COS-parametervalues (only for speech) are used:

- Manual number identification
  `ADD-COSSU:AVCE=MCIDM;`
- Automatic number identification
  `ADD-COSSU:AVCE=MCIDA;`

Identification (MFC-R2)

During identification the number of partner will be displayed. Since that feature is based on "Identification CO" the AMO-FEASU is applied.
`CHA-FEASU:TYPE=A,CM=TRACCO;`

- Class of trunk with identification for calls to the attendant
  `ADD-COT:COTPAR=ATDI;`
- Class of trunk with identification for calls over TIE trunks
  `ADD-COT:COTPAR=TIEI;`
- Class of service with identification for calls to normal subscriber
  `ADD-COSSU:AVCE=TSUID;`

10.40 On Hook Transfer per User or a Group of Users

The feature "On hook transfer" should be able to be activated per user or a group of users.

10.40.1 Feature Description

With the parameter **ONHKTRNS** in AMO FEASU it is possible to activate the function that a call transfer is allowed before the consulted party has answered the call in the whole system. This systemwide parameter is valid for every consulting party.

The parameter **NOONHKTR** (no on hook transfer) in AMO SDAT deactivates the on hook on transfer function per user or a group of users. This disables or enables for this station a call transfer to a ringing or busy destination.

When a call transfer to a ringing or busy destination is done it is determined if this call transfer is allowed considering the AMO FEASU and AMO SDAT parameters. If this is allowed the call is transferred. Otherwise the consulting party gets an immediate recall from the held party.

10.40.2 Service Information

The feature "on hook transfer per user or a group of users" will only be allowed if in AMO FEASU the parameter **ONHKTRNS and** in AMO SDAT paramter **NOONHKTRNS** are set. If the AMO FEASU parameter **ONHKTRNS** is not set then on hook transfer will not be allowed for any station.

It is also possible to use a range of station numbers with the AMO-SDAT in order to assign the **NOONHKTR** parameter for a group of stations.

For customers who want to keep the previous situation where every station is allowed to do on hook transfer only in AMO FEASU parameter **ONHKTRNS** must be set.

10.40.3 Generation (Example)

```
CHANGE-FEAUS:TYPE=A,CM=ONHKTRNS;
```

With the AMO SDAT the following command disables on hook transfer for station 2901:

```
CHANGE-SDAT: STNO=2901,TYPE=ATTRIBUTE,AATTR=NOONHKTR;
```

The following command enables on hook transfer for station 2901:

```
CHANGE-SDAT: STNO=2901,TYPE=ATTRIBUTE,DATTR=NOONHKTR;
```

10.40.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
FEASU	UML	d	Übergabe vor Melden
	ONHKTRNS	e	On hook transfer (transfer before answer)
SDAT	NUEBVMEL		Uebergeben vor Melden fuer Uebergebenden erlaubt.

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
	NOONHKTRNS	S	On hook transfer (transfer before answer) for consulting party not allowed

10.41 OpenStage TDM

10.41.1 Boards

OpenStage devices can be connected to the following boards:

- SLMO24 (Q2158-X)
- SLMOP (Q2169-X100)

IMPORTANT: It is not possible to connect an OpenStage terminal to a SLMQ board!

10.41.2 OpenStage terminal types

The following OpenStage TDM terminals are supported:

- OpenStage 10 T
- OpenStage 15 T
- OpenStage 20 T
- OpenStage 30 T
- OpenStage 40 T
- OpenStage 60 T
- OpenStage 80 T

10.41.3 Transmission Range

Table 59: Transmission range OpenStage T (0,6 mm cable)

Phone	Transmission range [dB]	Feeding range for 0,6 mm cable				
		Pmax [W]	U (OpenScape 4000) = 42V		U (OpenScape 4000) = 48V	
			Rcab [Ohm]	range [m]	Rcab [Ohm]	range [m]
OpenStage 10 T	16	1,5	234	1800	312	2400
OpenStage 20 T	16	1,5	234	1800	312	2400

Phone	Transmission range [dB]	Feeding range for 0,6 mm cable				
		Pmax [W]	U (OpenScape 4000) = 42V		U (OpenScape 4000) = 48V	
			Rcab [Ohm]	range [m]	Rcab [Ohm]	range [m]
OpenStage 40 T	16	2,3	130	1000	195	1500
OpenStage 60/80 T	16	2,2	143	1100	221	1700

Table 60: Transmission range OpenStage T (0,8 mmm cable)

Phone	Transmission range [dB]	Feeding range for 0,8 mm cable				
		Pmax [W]	U (OpenScape 4000) = 42V		U (OpenScape 4000) = 48V	
			Rcab [Ohm]	range [m]	Rcab [Ohm]	range [m]
OpenStage 10 T	16	1,5	234	3100	312	4200
OpenStage 20 T	16	1,5	234	3100	312	4200
OpenStage 40 T	16	2,3	130	1700	195	2600
OpenStage 60/80 T	16	2,2	143	1900	221	3000

Notes:

1) The actual range depends on the characteristics of the used cable (loss, diameter).

2) The maximum range is the minimum value of transmission range and feeding range.

3) If a local power supply is used, the feeding range is not relevant.

4) For transmisson ranges of different cable types please refer to Table 63, "Transmission range - cable types and their characteristics" (column 16dB).

Table 61: Transmission range - cable types and their characteristics

Cable type	Cable values			maximum range [m]		
	Delay	Loss	RLoop	Delay	Loss	
	[µs/km]	[dB/ km]	[Ohm/ km]	20,8 µs	16 dB	14,5 dB
J-2Y(ST)Y4x2x0,51 LG ICCS Data5	6,3	9,1	185	3300	1700	1500

Cable type	Cable values			maximum range [m]		
	Delay	Loss	RLoop	Delay	Loss	
	[µs/km]	[dB/ km]	[Ohm/ km]	20,8 µs	16 dB	14,5 dB
J-2YY ...x2x0,6/1,4 VIMF FR ICCS	6,3	9,1	130	3300	1700	1500
J-02YSCY4x2x0,5 PIMF ICCS300S	5,5	9,4	190	3800	1700	1500
J-02YS(ST)CY4x2x0,5 PIMF ICCS Data6	5,5	8,8	164	3800	1800	1600
J-2Y(ST)Y < 10x2x0,6 STIIIBD	6,3	10,8	130	3300	1400	1300
J-2Y(ST)Y > = 10x2x0,6 STIIIBD	6,3	8,8	130	3300	2100	1900
J-2Y(ST)Y < 10x2x0,8 STIIIBD	6,3	n.v.[18]	73,2	3300	[18]	[18]
J-2Y(ST)Y >= 10x2x0,8 STIIIBD	6,3	[18]	73,2	3300	[18]	[18]
Installation cable < 10x2x0,6 [19]	8	15,6	130	2600	1000	900
Installation cable >= 10x2x0,6 [19]	8	11	130	2600	1400	1300
Installation cable < 10x2x0,8 [19]	8	14	73,2	2600	1100	1000
Installation cable >= 10x2x0,8 [19]	8	8	73,2	2600	2000	1800
Outdoor cable < 10x2x0,6 STIIIBD [19]	6,3	9,6	130	3300	1600	1400
Outdoor cable >= 10x2x0,6 STIIIBD [19]	6,3	7,4	130	3300	2100	1900
Outdoor cable < 10x2x0,8 STIIIBD [19]	6,3	[18]	73,2	3300	[18]	[18]

[18] n.v. = no values available

[19] see examples below

Cable type	Cable values			maximum range [m]		
	Delay	Loss	RLoop	Delay	Loss	
	[µs/km]	[dB/ km]	[Ohm/ km]	20,8 µs	16 dB	14,5 dB
Outdoor cable >= 10x2x0,8 STIIIBD [19]	6,3	6,1	73,2	3300	[18]	[18]
Outdoor cable ...x2x0,4 [20]	6,3	10,5	300	3300	1500	1300
A-PM ...x2x0,6 STIIILG or BD [20]	5,5	6	130	3800	2600	2400
A-PM ...x2x0,8 STIIILG [20]	5,5	4,5	73,2	3800	3500	3200

Examples for installation cables:

- J-Y(ST)Y Nx2x0,6/0,8 LG
- J-YY Nx2x0,6/0,8 BD
- J-H(ST) H Nx2x0,6/0,8 BD FR NC
- JE-H(ST) H Nx2x0,8 BD FRNCX

Examples for outdoor cables:

- A-2Y(L) 2Y Nx2x0,4/0,6/0,8 ST III BD 1PPERF
- A-2YF(L) 2Y Nx2x0,4/0,6/0,8 ST III BD
- A-2Y0F(L)2Y Nx2x0,6/0,8 ST III BD
- A-02YS0F(L)2Y Nx2x0,6/0,8 ST III BD

10.41.4 Accessories

IMPORTANT: Both key modules, the application modules, the display modules, the busy lamp field and the adapters in the **optiPoint series** of telephones **cannot** be deployed or operated together with OpenStage. The only exception is the external power supply (L30250-F600-A190-A191-A192) for the telephones.

[20] do not use for new installations

Device type	Function
OpenStage key module 40, 60, 80	Key module with 12 programmable function keys. The user can program one of these keys as a SHIFT key to switch between two levels. For OpenStage 40 T, 60 T, 80 T. Up to 2 units can be connected.
OpenStage15 key module	Key module with 18 programmable function keys (no 2nd level available and therefore no programmable Shift key). For OpenStage 15 T, 30 T, 40 T. Only 1 unit can be connected.
OpenStage BLF (Busy Lamp Field)	90 additional freely programmable keys with LEDs; function, speed dial or line keys. External power supply necessary. For OpenStage 30 T, 40 T. Only 1 unit can be connected.
OpenStage Phone Adapter	Optional connection: Second OpenStage/optiPoint phone with UP0/E or, an analog device (phone or fax).

10.41.5 Configuration

10.41.5.1 Terminal Configuration

IMPORTANT: OpenStage 60/80 related settings, like volume or ring type, are not controlled by the system. So values set via AMO ACTDA/AMO KCSU are not used.

OpenStage terminals are configured in the same way as optiset terminals:

```
ADD-SBCSU:STNO=3100,OPT=OPTI,CONN=DIR,
PEN=number,DVCFIG=OPTISET,COS1=number,
COS2=number,LCOSV1=number,LCOSV2=number,
LCOSD1=number,LCOSD2=number,HEADESET=WITHIND;
```

IMPORTANT: **HEADSET=WITHIND** must be configured to get the correct display message in case the headset key is pressed and no headset is connected.

10.41.5.2 Key assignment

OpenStage telephones have fixed keys. For this reason, the correct standard key layouts must be assigned. The keys 1-8 must correspond to the illustrated examples. The variable keys start from key 9 onwards. Therefore, the appropriate key layout for every OpenStage terminal is available in AMO TAPRO (parameter **DIGTYP**).

SHIFT key

A SHIFT key can also be configured on OpenStage terminals (previously this was only possible on key modules). This is achieved with the AMO TAPRO or via the Service menu on the terminal.

```
CHANGE-TAPRO:STNO=<station number>,
KYxx=SHIFT;
```

IMPORTANT: xx must be greater than 08 since the first 8 keys are fixed. Only key 9 and onwards can be freely assigned.

When the SHIFT key is pressed on an optiPoint key module, the same action is performed on all other key modules. In other words, the SHIFT level is also activated on the second and fourth key modules.

This is not the case on OpenStage telephones and key modules. In this case, the SHIFT level is only activated on the telephone/key module on which the SHIFT key was pressed.

10.41.5.3 Master/Slave Configuration Downstream from Up0 Extender (Phone Adapter)

Figure 110: Phone adapter (Up0 extender)

Possible use

The following terminals can be connected to the phone adapter:

- Up0 system telephone:
  - OpenStage 20 T
  - OpenStage 40 T
  - OpenStage 60 T and 80 T (require their own power supply unit)
  - optiPoint 500 (must be connected to Up0 Slave output socket)

- Analog device:
  - Phone with MFV tone dialing (e. g. Euroset 5020 or a cordless phone such as Gigaset A160),
  - a Group 3 fax or
  - a modem.

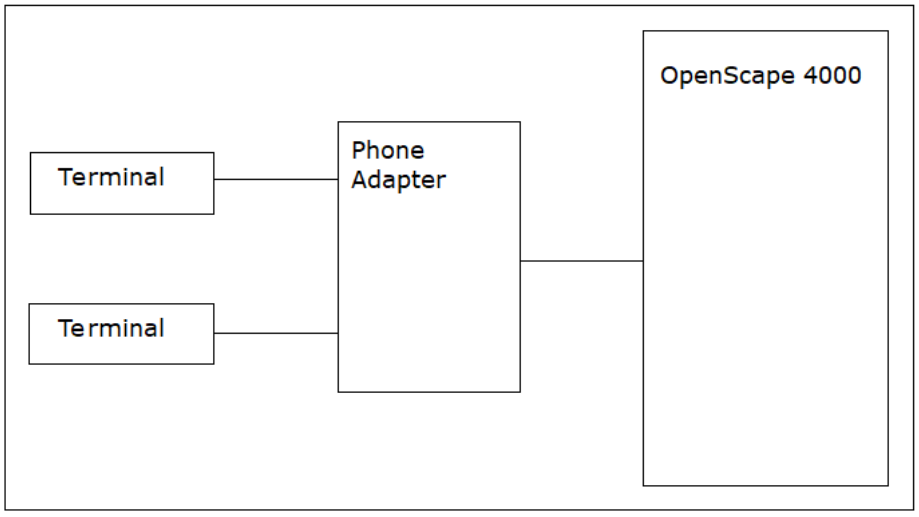
> **IMPORTANT:** Analog telephones at the phone adapter act as DSS1 phones. Therefore the same call processing features available to S0/S2 terminals with the E-DSS1 protocol are also available to the analog terminals at the telephone adapter. This means that some of the normally available ANATE features are **not** supported. For example: PIN-specific features, such as class-of-service changeover, follow me/FWD transfer, Autoset relocate, Night station

The Phone Adapter can be used in the following configurations only:

- One Up0 system telephone (Up0 Master)
- Two Up0 system telephones (Up0 Master, Up0 Slave)
- One Up0 system telephone and one analog terminal (Up0 Master, a/b)

> **IMPORTANT:** It is not possible to operate two Up0 system telephones and one analog device.

Installation



Ports on the Phone adapter

There are five sockets (from right to left):

- Power
- Up0-IN (from the OpenScape 4000)
- Up0-Out1 (to the master phone) = Up0 Master output socket
- Up0-Out2 (to the slave phone) = Up0 slave output socket
- a/b = analog output socket

A small slide switch is located between the Up0-Out2 and the a/b. When the slide switch is moved, the output closest to it is enabled:

- if the switch is moved to the left towards the a/b socket -> the a/b (analog) output is enabled, you can connect an analog device
- If the switch is moved to the right: the Up0 slave is enabled, you can connect a further Up0 phone

The switch is read during power-up, and then enables the appropriate output. Reconfiguration during live operation is therefore not possible.

You must connect an OpenStage phone to the "Up0 Master output socket" in order to be able to operate devices on the "Up0 Slave" and "Analog" output sockets..

Example

Up0 master:

```
ADD-SBCSU:STNO=3100,OPT=OPTI,CONN=DIR,PEN=number,
DVCFIG=OPTISET&VIRTDTE,COS1=number,
COS2=number,LCOSV1=number,LCOSV2=number,LCOSD1=number,
LCOSD2=number,DPROT=SBDSS1,DOPTIDX=1;
```

Up0 slave:

```
ADD-SBCSU:STNO=3101,OPT=OPTIEXP,MAINO=3100,
DVCFIG=OPTISET&VIRTDTE,DPROT=SBDSS1,
DOPTIDX=1;
```

The terminal must now still be activated:
`RESTART-DSSU:TYPE=STNO,STNO=3100&3101;`

or

Analog device:

The analog device can be configured with the same call number as ANAFAX:

```
ADD-SBCSU:STNO=3100,OPT=OPTI,CONN=DIR,PEN=number,
DVCFIG=OPTISET&VIRTDEE&ANAFAX,COS1=number,
COS2=number,LCOSV1=number,LCOSV2=number,LCOSD1=number,
LCOSD2=number,DPROT=SBDSS1,DOPTIDX=1;
```

or as an analog device with another call number:

Up0 master:

```
ADD-SBCSU:STNO=3100,OPT=OPTI,CONN=DIR,PEN=number,
DVCFIG=OPTISET&VIRTDEE,COS1=number,COS2=number,
LCOSV1=number,LCOSV2=number,LCOSD1=number,
LCOSD2=number,DPROT=SBDSS1,DOPTIDX=1;
```

Up0 slave:

```
ADD-SBCSU:STNO=3101,OPT=OPTIEXP,MAINO=3100,
DVCFIG=ANADEV;
```

For further details on the Phone adapter please refer to the installation guide.

10.41.5.4 OpenStage Busy Lamp Field

In AMO TAPRO the appropriate key layout for the terminal must be chosen.

The OpenStage busy lamp field is also supported for optiPoint 500.

Hint:

Adding each BLF module uses 5 counts of DIMSU parameter OPTEXP.

OpenStage BLF for OpenStage

```
CHANGE-SBCSU:STNO=3100,OPT=OPTI,REP=0,BLF=Y;
 CHANGE-TAPRO:STD=55,DIGTYP=OST40BLF;
```

OpenStage BLF for optiPoint 500

The key configuration is similar as for an OpenStage device with busy lamp field. Not 90 keys are configured on one add-on device but 5 add-on devices each with 18 keys. So each column with 18 keys on the busy lamp field can be thought as one add-on device.

For OpenStage BLF for optiPoint 500 the **DIGTYP** value **OPTIBLF** has been introduced for the busy lamp field in AMO TAPRO. A layout with this type has to be used for the key layout configuration of an optiPoint device with BLF.

A number for the key layout (**STD=127**) for the **DIGTYP=OPTIBLF** must be configured.

Example:

```
CHANGE-SBCSU:STNO=3110,OPT=OPTI,REP=0,BLF=Y;

CHANGE-TAPRO:STD=127,DIGTYP=OPTBLF,KY01=CH;

REGEN-TAPRO:TYPE=STD,STD=127;

CHANGE-TAPRO:,127,OPTIBLF ,CH ,FREE ,FREE ,FREE ,FREE ,
                           FREE ,FREE ,FREE ,FREE ,FREE ,
                           FREE ,FREE ,FREE ,FREE ,FREE ,
                           FREE ,FREE ,FREE ,FREE ,
                           " ";

CHANGE-TAPRO:,127,OPTIB1 ,FREE ,FREE ,FREE ,FREE ,FREE ,
                          FREE ,FREE ,FREE ,FREE ,FREE ,
                          FREE ,FREE ,FREE ,FREE ,FREE ,
                          FREE ,FREE ,FREE ;

CHANGE-TAPRO:,127,OPTIB2 ,FREE ,FREE ,FREE ,FREE ,FREE ,
                          FREE ,FREE ,FREE ,FREE ,FREE ,
                          FREE ,FREE ,FREE ,FREE ,FREE ,
                          FREE ,FREE ,FREE ;

CHANGE-TAPRO:,127,OPTIB3 ,FREE ,FREE ,FREE ,FREE ,FREE ,
                          FREE ,FREE ,FREE ,FREE ,FREE ,
                          FREE ,FREE ,FREE ,FREE ,FREE ,
                          FREE ,FREE ,FREE ;

CHANGE-TAPRO:,127,OPTIB4 ,FREE ,FREE ,FREE ,FREE ,FREE ,
                          FREE ,FREE ,FREE ,FREE ,FREE ,
```

```
                                FREE ,FREE ,FREE ,FREE ,FREE ,
                                FREE ,FREE ,FREE ;

CHANGE-TAPRO:,127,OPTIB5 ,FREE ,FREE ,FREE ,FREE ,FREE ,
                                FREE ,FREE ,FREE ,FREE ,FREE ,
                                FREE ,FREE ,FREE ,FREE ,FREE ,
                                FREE ,FREE ,FREE ;

AMO-TAPRO-111 PROGRAMMABLE KEY DEFINITION FOR DIGITAL
TERMINALS REGENERATE COMPLETED;
```

10.41.5.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
SBCSU	BEIGER	d	Anzahl der vorhandenen Beistellgeräte
	REP	e	Number of add-on devices
	BLF	d	Belegtlampenfeld
	BLF	e	Busy Lamp Field
TAPRO	DIGTYP	d	Art des Sprachterminals (OPTIBLF, OST40BLF, ...)
	DIGTYP	e	Type of voice terminal (OPTIBLF, OST40BLF, ...)

10.41.6 TDM Software Download

10.41.6.1 Feature description

IMPORTANT: The **TDM Software Download is** only **supported** for OpenStage endpoints connected to a **SLMOP** (**issue 9 or higher**) or to a **SLMO24**. The **TDM Software Download is not supported** for OpenStage endpoints connected to a **STHC/SLMQ**.

New software for the TDM OpenStage telephones and the Phone adapter can be downloaded via the TDM software download. The download is started via the **TDM Software Deployment Manager** (**Software Management - TSDM**) in OpenScape 4000 Assistant. The application first transfers the telephone software to one OpenStage TDM telephone via the D channel. This terminal establishes a B channel connection to another OpenStage TDM telephone via the virtual S0 adapter (**AMO SBCSU**: parameter **VIRTDTEE** (for **VIRTDEE** no licenses are required)) and transfers the telephone software via the B channel. These two telephones establish B channel connections to other OpenStage

telephones, ensuring that the telephone software is transferred to all TDM OpenStage telephones during this "snowball" TDM download. So that the TDM software download can function correctly, the parameter **ADTE=GRUBE** must also be set in the **AMO COSSU**.

Refer to the online help for further information about "TDM Software Deployment Manager".

TDM download times:

- Via D channel to TDM OpenStage 20T/40T: Approximately 5 minutes
- Via B channel to TDM OpenStage 20T/40T: Approximately 1,5 minutes
- Via D channel to TDM OpenStage 60T/80T: Approximately 4,5 hours
- Via B channel to TDM OpenStage 60T/80T: Approximately 1,5 hours

10.41.6.2 Restriction

The "fast" (via B channel) TDM software download (snowball system) does not work if the OpenStage TDM is also configured for 1st Party CTI (**AMO SBCSU**, **DVCFIG=API**). This is because the terminal must be configured for B channel download in the AMO SBCSU using **DVCFIG=VIRTDTE**. However, for 1st Party CTI, **DVCFIG=API** must be configured in the AMO SBCSU. Both are not possible at the same time.

The only alternative for customers that use 1st party CTI on OpenStage TDM telephones is the "slow" software download via the D channel, which must be activated separately for each telephone in OpenScape 4000 Assistant.

10.41.6.3 Configuration

1) As described before, the telephones on which the software is to be loaded must be configured with the new value **VIRTDTE** instead of **DTE**.

```
ADD-SBCSU:STNO=3100,TYPE=OPTI,CONN=DIR,PEN=number,
DVCFIG=OPTISET&VIRTDTE,COS1=number,COS2=number,
LCOSV1=number,LCOSV2=number,LCOSD1=number,LCOSD2=number,
DPROT=SBDSS1,DOPTIDX=1;
```

2) In addition to **VIRTDEE**, the **BASIC** COS parameter must be set under **DTE** in the AMO SBCSU:

```
DIS-COSSU:TYPE=COS,COS=<cos_number>;
 H500:  AMO COSSU STARTED
    +------+----------------+--------------
+-----------------+

   | COS  |     SPEECH      |      FAX      |       DTE
      |

   +------+----------------+--------------
+-----------------+

   |   13 |>
      |
```

```
   |       |       TA        |       TA       |       TA
      |
   |       |       TNOTCR    |       TNOTCR   |
 TNOTCR    |
   |       |       CDRSTN    |       BASIC    |
  BASIC     |
   |       |       COSXCD    |                |
      |
   |       |       MB        |                |
      |
   |       |       CFNR      |                |
      |
   |       |       FWDNWK    |                |
      |
   |       |       TTT       |                |
      |
   |       |       FWDECA    |                |
      |
   +------+-----------------+---------------
+-----------------+


 AMO COSSU-111 - Classes of service

 ABFRAGEN DURCHGEFUEHRT;
```

If **BASIC** is not entered in the **DTE** column, this must be configured:

```
CHA-COSSU:TYPE=COS,COS=<cos number>,
ADTE=TA&TNOTCR&BASIC;;
```

3) The terminal must now still be activated:
`RESTART-DSSU:TYPE=STNO,STNO=3100;`

10.42 PIN (Personal Identification Number)

The personal identification number (PIN) is used for identification of a call number by the system. Each call number can be assigned any number of PINs. There are 15 different types of PINs, each of which (exception: PINC) can be activated by means of its own code (AMO WABE). A PIN application is initialized for each type of PIN. The predefined PIN applications can be altered or redefined by specifying additional PIN/PCODE attributes.

10.42.1 PIN Types

The following PIN types are defined in the system:

PIN1 (Mobile Users)

PIN1 is used for identification by manual dialing (mobile users).

Use:

Users can "identify" themselves to the system at a "foreign" station by dialing a secret PIN, which does not appear on the display when dialed. This enables them to use the class-of-service (COS1) and key functions of their "home" station. The PIN is active for a specific, configurable time. The PIN and the call number of the user's home station are entered in the call data recording records as the chargee for any calls made. Users can deactivate their PIN1 before the timer runs out via a corresponding delete procedure.

PIN2 (Business, Long-Term)

PIN2 is used for the identification of business calls, and remains active until deleted manually.

Use:

Following input, the PIN is permanently activated. The PIN can be deactivated via a delete procedure.

PIN3 (Business, Per-Call)

PIN3 is used for the identification of a single business call.

Use:

The PIN is only active for the duration of the call. At the end of this period the station reverts automatically to its operating state prior to input of the PIN3. If, for example, a PIN2 was active before the PIN3 was input, then the former becomes active again as soon as the PIN3 call has been terminated!

PIN4 (Private, Per-Call)

PIN4 is used for the identification of a single private call.

Use:

The PIN is only active for the duration of a call. At the end of this period the station reverts automatically to its operating state prior to input of the PIN4. This is an effective means of distinguishing business calls from private calls in the call data recording records.

PIN5 (PCODE)

PIN5 is used for the identification of a project-specific call (project code=PCODE).

Use:

The project code is a digit sequence which is assigned to a project, object, etc. It is used for allocating costs, e.g. telephone charges, to a specific project. Unlike the personal identification number (PIN), the project code (PCODE) is not assigned to a specific user. The classes of service (COS1) and features of the station at which the PCODE was entered are available to the caller. The PCODE can be checked for validity (see also Section 132.14.10, "Verifying the

PIN/PCODE"). It is not secret and concealed input is not necessary. Input errors are indicated on terminals with displays.

PIN6: PINC (PIN CARD)

PINC is used for identification by means of a magnetic card or chip card which is inserted in the identity card reader at the terminal.

Use:

Users identify themselves by inserting/removing a chip card. The identity card has priority over PIN1.

V2.0 and higher supports the application-based use of smart cards (see Chapter 138, "Smart Card Application").

PIN7: COSXCD (Class of Service Changeover Code)

COSXCD is used for identification purposes in connection with the activation of class of service changeover from the terminal.

Use:

Class of service changeover from COS 1 to COS 2 and vice versa can be performed with the aid of the PIN. It is possible to configure whether changeover to COS 2 is to take place with or without prior input of the PIN.

PIN8: Service Identification PIN (Service Identifier)

The service identifier (SI) is used by service personnel as a top-priority PIN for "registering" or canceling a user at a terminal (see also Section 132.11, "Service Identifier" on "Autoset Relocate" feature).

PIN9: CDRAC (Account Code)

The "Account Code" feature allows individual incoming and outgoing calls to be assigned an account number or, consecutively, with several account codes which are displayed in the call data recording records (see also the chapter on call data recording).

PIN10 (Forced-Authorization-Code)

A PIN code is demanded for certain voice numbers configured in the LCR Dialplan for calls to the public network or on tie line circuits dialed during an initial call, a consultation call or when performing call forwarding. A typical application case is, for example, on a campus, where users have to identify themselves via PIN on generally accessible phones for the purposes of call charging.

For further information, please refer the Feature Usage Example LCR (Least Cost Routing, Section 36.11, "LCR Autorization PIN (Forced Authorization Code)".

PIN11 to PIN15 (Mobile Users)

PIN11 to PIN15 are predefined as per PIN1 and can be configured and used like PIN1.

10.42.2 Functions / Restrictions when using a PIN

Feature	Internal PIN
Transfer authorizations	For outgoing calls only, not for incoming calls.
PIN for call detail recording	Yes
Follow me / FWD transfer. Caution: Note the restrictions for FWD and FNA	Yes
Speed dialing facility	Yes
Individual speed dialing	Yes
WABE	The WABE group of the originating station is valid.
IBM SMART, CF switch	Yes (for virtual and physical stations).
ITR group	The ITR group for the originating station is valid.
Repertory dialing keys	Repertory dialing keys are transferred provided they are configured on the device. Both devices should be the same type (although it is theoretically possible, modifying the layout is too complicated).
DSS keys	See repertory dialing keys.
Redial	Transferred.
Enter timed reminder	Yes. A timed reminder is entered on the originating station and is later diverted via the call forwarding (follow-me) function. This means it can also be used for virtual stations.
Mailbox	Yes. Standard access and scroll functions for mailbox. In the case of VMS, a connection to the server is established by pressing the start key. View, perform and delete callbacks.

10.42.3 PIN / PCODE Activation

The PIN / PCODE is activated prior to the call being placed. This can take place in idle state or in dialing state by using the appropriate code or via the service menu.

When you enter the PIN, you can choose to display '*' instead of the actual PIN.
`CHA-PERSI:TYPE=COPIN,COPIN=number,DISPPIN=NO;`

Internal PIN also allows the PIN to be entered in consultation state. A short PIN is only valid for the consultation call and is automatically deleted at the end of

the call. A long PIN entered in consultation state is valid for the consultation call and the following calls, as long as the PIN is activated.

A PIN cannot be activated in consultation state with "network-wide PIN".

In the case of activated COS2 at terminals in use, PIN entry can be prevented with:
`CHA-PERSI:TYPE=COPIN,COPIN=number,PINLCOS2=YES;`

10.42.4 Length of PIN

The length of the particular type of PIN is defined centrally; it is possible to define the same length for all PIN types, or different lengths for different PIN types. Each PIN number (except for COSXCODE) must be unique in the system.

For the network-wide PIN feature, the same PIN numbers may be assigned in different nodes. The length of a particular PIN type may also vary from node to node.

The manually entered PIN/PCODE consists of a maximum of 12 characters, either digits or the character *. The PIN for a card also comprises 12 characters (digits, letters, special characters) from the ASCII character set. The hash character '#' is no longer permissible as a PIN/PCODE/SI character, since this character is used as an end-of-string character for the network-wide PIN feature.

Before the length of a PIN number can be changed, all PINs of this type must be deleted.

Change length of PINC (ID-card PIN):
`CHA-PERSI:TYPE=SYS,PINCLEN=number;`

10.42.5 Manual PIN Types (PIN1 to PIN4 and PIN10-15)

- Assign digit analysis results for PIN1 to PIN4 and PIN10 to PIN15 activation code:

```
ADD-WABE:CD=key-num,DAR=APIN1;

ADD-WABE:CD=key-num,DAR=APIN2;

ADD-WABE:CD=key-num,DAR=APIN3;

ADD-WABE:CD=key-num,DAR=APIN4;

ADD-WABE:CD=key-num,DAR=APIN10;

ADD-WABE:CD=key-num,DAR=APIN11;

ADD-WABE:CD=key-num,DAR=APIN12;

ADD-WABE:CD=key-num,DAR=APIN13;

ADD-WABE:CD=key-num,DAR=APIN14;
```

```
ADD-WABE:CD=key-num,DAR=APIN15;
```

- Assign digit analysis results for PIN1 to PIN4 and PIN10 to PIN15 deactivation code:
  `ADD-WABE:CD=key-num,DAR=DPIN;`

  IMPORTANT: Please note that there is only one digit analysis result for PIN deactivation. It applies to PIN types PIN1 to PIN4 and PIN10 to PIN15

- Assign length of PIN number

  ```
  ADD-PERSI:TYPE=SYS,PIN1LEN=number,PIN2LEN=number,
  PIN3LEN=number,PIN4LEN=number,PIN10LEN=number,
  PIN11LEN=number,PIN12LEN=number, PIN13LEN=number,
  PIN14LEN=number, PIN15LEN=number;
  ```

- Assign PIN to a station number

  ```
  ADD-PERSI:TYPE=STN,STNO=number,PIN1=string,PIN2=string,
  PIN3=string, PIN4=string,PIN10=string,PIN11=string,
  PIN12=string, PIN13=string, PIN14=string,PIN15=string;
  ```

- Changing PIN (OLDPIN and NEWPIN must be of equal length)
  `CHA-PERSI:TYPE=PIN,OLDPIN=string,NEWPIN=string;`

10.42.6 PIN Card (Chip Card)

- Assigning length and pointer of chip card PIN
  `ADD-PERSI:TYPE=SYS,PINCLEN=number,PINPOINT=number;`
- Assigning personal identification number to a station number
  `ADD-PERSI:TYPE=STN,STNO=number,PINC=string;`
- Changing pointer of chip card PIN
  `CHA-PERSI:TYPE=PINPOINT,PINPOINT=number;`
- Changing PINC number (OLDPIN and NEWPIN must be of equal length):
  `CHA-PERSI:TYPE=PIN,OLDPIN=string,NEWPIN=string;`

10.42.7 Class of Service Changeover Code (COSXCD)

- Assigning codes for class of service changeover

  `ADD-WABE:CD=key-num,DAR=ACOSX;` (activate)

  `ADD-WABE:CD=key-num,DAR=DCOSX;` (deactivate)
- Assigning length of class of service changeover code
  `ADD-PERSI:TYPE=SYS,COSLEN=number;`
- Assigning COS changeover code as personal identification number
  `ADD-PERSI:TYPE=STN,STNO=number,COSXCD=string;`
- Change class-of-service switchover code (OLDPIN and NEWPIN must be of equal length):
  `CHA-PERSI:TYPE=PIN,OLDPIN=string,NEWPIN=string;`

10.42.8 Class of Service Changeover to COS2 without COSXCD

It is also possible to switch over to COS2 without entering the COSXCD, by dialing the DCOSX code instead.
`ADD-PERSI:TYPE=SYS,COSXCOS2=N;`

10.42.9 PIN Display on DIGITE Display

Setting PIN display for PIN types
`ADD-PERSI:TYPE=SYS,PINDISP=number;`

10.42.10 Project Code

- Assign digit analysis results
  `ADD-WABE:CD=number,DAR=APIN5;`

  `ADD-WABE:CD=number,DAR=DPIN;`

  IMPORTANT: Please note that there is only **one** digit analysis result for PIN deactivation. It applies to PIN types PIN1 to PIN5 and PIN11 to PIN15.
- Assign length of PCODE
  `ADD-PERSI:TYPE=SYS,PIN5LEN=number;`
- Assign project code
  `ADD-PERSI:TYPE=PCODE,PCODE=string,PINTYPE=5;`

10.42.11 Service Identifier

- Assign DAR pair for service indicator for feature "Autoset Relocate" (SIGNON/SIGNOFF)
  `ADD-WABE:CD=key-num,DAR=SIGNON,CD2=key-num;`

  IMPORTANT: **CD** = code for **signing on**, **CD2** = code for **signing off**.
- Assign length of service identifier
  `ADD-PERSI:TYPE=SYS,SILEN=number;`
- Assign service identifier
  `ADD-PERSI:TYPE=SI,SI=string;`

10.42.12 Account Code

- Assign DAR pair for service indicator for feature "Account Code"(SIGNON/SIGNOFF):
  `ADD-WABE:CD=key-num,DAR=CDRACC;`

  IMPORTANT: CD = code for signing on. Signing off is performed automatically at the end of the call.

- Assign length of Account Code:
  `ADD-PERSI:TYPE=SYS,CDRACLEN=number;`
- Assign Account Code (only numerical entries permitted):
  `ADD-PERSI:TYPE=CDRAC,CDRAC=number;`

10.42.13 Forced Authorization Code

- Assign length of Forced Authorization Code:
  `ADD-PERSI:TYPE=SYS,PIN10LEN=number;`
- Assigning Forced Authorization Code to a station number:
  `ADD-PERSI:TYPE=STN, STNO=number,PIN10=string;`

10.42.14 PIN Attributes

All 15 PIN types can be used in a system concurrently. Each PIN type can be assigned with similar and/or different attributes. These attributes are contained in PIN classes called COPIN (class of PIN). The COPINs 1 - 7 and 9 - 15 can be changed with the AMO PERSI; COPIN 8 is an SI PIN type, the initialized values of which may not be changed.

The following PIN attributes can be defined in a COPIN:

10.42.14.1 PIN Type

COPINs 1 to 5 and 10 to 15 can be assigned to any of the following PIN types:

- mobile user (MOBILE)
- Project code (PCODE)
- Business calls, long-term activation (BUSLONG)
- Business calls, activation per call (BUSSHRT)
- Private calls, activation per call (PRIVSHRT)

This is not possible for the following COPINs, as these are of a fixed defined type:

- COPIN 6: PIN CARD
- COPIN 7: COSXCD
- COPIN 8: SI
- COPIN 9: CDRAC

You can also assign a PINTEXT or description of the COPIN in order to identify it more easily.

Change PIN type (e.g. in PCODE)

```
CHA-PERSI:TYPE=COPIN,COPIN=<number>,
COTYPE=PCODE,PINTEXT="PCODE 2";
```

10.42.14.2 Duration of PIN Activation

The PIN can be activated for 1 call only, permanently or for a pre-defined time. The timer required for the latter option is administered with the CTIME AMO.

- Duration of PIN activation

  Set PIN duration for 1 call only
  ```
  CHA-PERSI:TYPE=COPIN,COPIN=number,PINDUR=ONE;
  ```

  Set PIN duration to 'permanent'
  ```
  CHA-PERSI:TYPE=COPIN,COPIN=number,PINDUR=PERM;
  ```

  Set PIN duration to 'timed'
  ```
  CHA-PERSI:TYPE=COPIN,COPIN=number,PINDUR=TIME;
  ```
- Set timer for timed PIN for PIN types PIN1 - 5 and 10 to 15 for Voice and Non Voice
  ```
  CHA-CTIME:TYPESWU=CP1,PINV01=number,PINNV1=number;

  CHA-CTIME:TYPESWU=CP1,PINV02=number,PINNV2=number;

  CHA-CTIME:TYPESWU=CP1,PINV03=number,PINNV3=number;

  CHA-CTIME:TYPESWU=CP1,PINV04=number,PINNV4=number;

  CHA-CTIME:TYPESWU=CP1,PINV05=number,PINNV5=number;

  CHA-CTIME:TYPESWU=CP1,PINV010=number,PINNV10=number;

  CHA-CTIME:TYPESWU=CP2,PINV011=number,PINNV11=number;

  CHA-CTIME:TYPESWU=CP2,PINV012=number,PINNV12=number;

  CHA-CTIME:TYPESWU=CP2,PINV013=number,PINNV13=number;

  CHA-CTIME:TYPESWU=CP2,PINV014=number,PINNV14=number;

  CHA-CTIME:TYPESWU=CP2,PINV015=number,PINNV15=number;
  ```

Important note on the PIN timer:

For this timer, values between 1 second and 18 hours can be entered. Setting the timer value in minutes (default: 5 min.) is recommended, as the timer is restarted after end of call and the active time of the PIN is extended. Setting the timer value in hours and a high number of PIN activations could lead to lack of resources, i.e. timer elements which, in turn, leads to system restarts.

10.42.14.3 User Identification Display on Digite

When a PIN user activates his/her PIN at a foreign station, the telephone display shows 'IDENTIFICATION stno' as a positive acknowledgement. The 'stno' output is a variable, defined by the user's home station number. The length of this display can be set to 'permanent' or 'timed' (default value 5 seconds).

- Timed identification display
  `CHA-PERSI:TYPE=COPIN,COPIN=number,DISPID=TIMEDISP;`
- Permanent identification display
  `CHA-PERSI:TYPE=COPIN,COPIN=number,DISPID=PERMDISP;`

10.42.14.4 PIN-Identification at Home Station Only

PIN codes can be further restricted for use at the user's home station only.

- PIN-identification at home station only:
  `CHA-PERSI:TYPE=COPIN,COPIN=number,IDHOME=Y;`

10.42.14.5 Transferring classes of service

You can 'transfer' the COS1 classes of service from the home station to the foreign station and operate them from the foreign station.
`CHA-PERSI:TYPE=COPIN,COPIN=number,TRANSFER=ALL;`

To use the home station's current COS for identification at the foreign station:
`CHA-PERSI:TYPE=COPIN,COPIN=number,COSHOME=YES;`

10.42.14.6 COS and Key Function Transfer from Home Station (internal PIN only)

With the internal PIN feature, certain key functions and LED functions can be transferred from the user's home station, and used at the foreign station for the duration of the PIN activation. This function is not possible with the network-wide PIN feature.

The following key functions and LED functions can be transferred from the user's home station:

Repertory keys (REP) and Direct Station Select (DSS) keys are transferred to the same position on the foreign station

- Mailbox LED (MB)
- Call forwarding key (FWD)
- Saved number redial key (SNR)
- Timed reminder (REMIND) keys. The keys can be programmed at a foreign station (timed reminder call follows call forwarding).
- Enable function transfer for key functions and COS (incl. ITR and DPLN groups) (internal PIN feature only):
  `CHA-PERSI:TYPE=COPIN,COPIN=number,TRANSFER=ALL;`

- No function transfer
  `CHA-PERSI:TYPE=COPIN,COPIN=number,TRANSFER=NO;`

  IMPORTANT: The function transfer is only possible for the internal PIN feature, i.e. not possible for the network-wide PIN feature.

10.42.14.7 PIN-Entry in Repertory Keys and Speed Dialing List (internal PIN only)

- Allow PIN entry in repertory keys and individual speed dialing list.
  `CHA-PERSI:TYPE=COPIN,COPIN=number,PINKEY=Y;`

10.42.14.8 Automatic Exchange Seizure

Automatic exchange line seizure after PIN/PCODE entry. The PIN user can immediately begin dialing the public network subscriber's number. The Digite display shows the exchange line access code.

- Add exchange code
  `ADD-WABE:CD=key-num,DAR=CO;`
- Define code for automatic exchange line seizure with universal exchange access code
  `CHA-PERSI:TYPE=COPIN,COPIN=number,TRKCD=key-num,TRKCDTYPE=UNICD;`

  In a different variant of this feature, you can disable the universal exchange access code for the user, i.e. the user cannot seize an exchange line without dialing the PIN. Assign with WABE AMO (CPS=4 for ATND) and AMO RICHT.
- Assign exchange access code
  `ADD-WABE:CD=key-num,CPS=4,DAR=AMT;`
- Define code for automatic exchange line seizure via PIN only.
  `CHA-PERSI:TYPE=COPIN,COPIN=number,TRKCD=key-num,TRKCDTYPE=PINCD;`
- It is also possible to prevent automatic exchange seizure.
  `CHA-PERSI:TYPE=COPIN,COPIN=number,TRKCDTYPE=NO;`

  After the automatic exchange seizure, the PIN text "Identification CD" appears on the Digite display. The exchange access code is shown on the display instead with the following setting:
  `CHA-PERSI:TYPE=COPIN,COPIN=number,ANZAMTKZ=YES;`

10.42.14.9 Additional Text for Call Data Recording (internal PIN only)

Users can choose between a PIN type by dialing a code. An additional text entry in the call data record allows users to discriminate between calls made with different PIN types and assign call charges accordingly. The additional text is an ASCII character string between 1 and 11 characters. The length of the PIN also defines the maximum length of the additional text. The PIN and CDRTEXT together must not exceed 12 characters.

- Assign additional text for CDR (internal PIN feature only)
  `CHA-PERSI:TYPE=COPIN,COPIN=number,CDRTEXTS=Y,CDRTEXT=text;`

  Note: Additional CDR texts with the AMO PERSI are not permitted for the network-wide PIN feature. Workaround: configure additional CDR texts with the CDR AMOs.

  IMPORTANT: The configuration of additional CDR texts via the AMO PERSI are only permitted for the internal PIN feature, i.e. not for the network-wide PIN feature.

10.42.14.10 Verifying the PIN/PCODE

The PIN/PCODE can undergo several tests, in order to prevent unauthorized use, as far as possible. The following test settings can be defined:

- The PIN/PCODE is not tested (for PIN9-CDRAC only)
  `CHA-PERSI:TYPE=COPIN,COPIN=number,PINTEST=NO;`
- Only the length of the PIN is checked
  `CHA-PERSI:TYPE=COPIN,COPIN=number,PINTEST=LENGTH;`
- The PIN/PCODE is checked against the PIN/PCODE table. This is only possible for the internal PIN feature:
  `CHA-PERSI:TYPE=COPIN,COPIN=number,PINTEST=TABLE;`
- The PIN/PCODE is checked algorithmically (modulo test). You can choose between 3 different test algorithms, **MODULO1**, **MODULO2** or **MODULO3**:

  `CHA-PERSI:TYPE=COPIN,COPIN=number,PINTEST=MODULO1` or `MODULO2` or `MODULO3`;

  IMPORTANT: PIN/PCODE table verification is not possible for the network-wide PIN feature.

10.42.14.10.1 Algorithmic "MODULO-N" Verification of PIN/PCODE

Test algorithm

Customers can set the verification algorithm required for the MODULO-N verification function. The expected PIN entry consists of the administered PIN code plus a verification code, i.e. PIN length = PIN+verification code. The verification code is 1-2 digits long and must be included in the PIN, as follows:

Formula for MODULO-N verification

PIN:	k	P1	k	P2	k	P3	k	P4	k	
		x		x		x		x		k alternative, possible positions for verification code
Weighting:		G1		G2		G3		G4		

Product:	pPG1+		pPG2+		pPG3 +		pPG4 = check sum			

	(or: qpPG1+qpPG2+qpPG3+qpPG4)		
Modulo-N:	Check sum + modules	=	x, remainder y

The verification code can either be defined as:

1) code = remainder y or code = modulus minus remainder y (complement)

Key to abbreviations in above equations:

P	=	PIN code digit
G	=	Weighting value
pPG	=	Product of (P x G)
qpPG	=	Sum of digits of products of (P x G)

The verification code is calculated as follows:

1) Each individual digit of the PIN code is multiplied with the appropriate weighting value. When assigning the weighting values (parameter VALENCE), a value must be specified for each entered digit of the PIN, i.e. PIN code plus verification code. This is especially important if the verification code position is not at the end of the actual PIN code.

2) The check sum is achieved by

a) adding each product of (PxG), see example

or

adding the sum of the digits of each product of (PxG)

3) The modulo-N operation is then performed, i.e. the check sum is divided by the modulus. The verification code can either be defined as

a) the remainder left over from this division (see example)

or

the difference between the remainder and the modulus (complement).

Note:

- Single-digit verification code

  If the verification code is defined as a single-digit code, and the calculated verification code is a two-digit number, the first digit is dropped and only the second digit is used (i.e. '19' becomes '9')
- Two-digit verification code:

  If the verification code is defined as a two-digit code, and the calculated verification code is a single-digit number, a zero is prefixed as the first digit (i.e. '9' becomes '09').

  PIN length = PIN code plus verification code (if assigned).

PERSI settings for the MODULO-N verification:

You can define up to 3 modulo-N algorithms with the AMO PERSI. These are assigned to PIN types via the class-of-PIN COPIN.

Algorithm settings:

- Weighting value (VALENCE). Single-digit value, from 1 - 9. Must be specified for all 12 possible digits of a PIN number. [Default: 2-1-2-1-2-1-2-1-2-1-2-1]
- Modulus (MODULUS). Up to two digits, from 2 - 99 [Default: 10]
- Length of verification code (CHKNLEN) Single-digit or two-digit code (1 or 2) [Default: 1] = single digit
- Calculation of verification code (TYPECHKN) - remainder of modulo-N operation (division) or - complement of remainder to modulus [Default: complement of remainder to modulus]
- Check sum type (TYPESUM) - sum of products of (PxG) or - sum of all digits of products of (PxG) [Default: sum of products]

PIN type-specific settings

- Position of the verification code within the PIN code (1st pos. - 12th pos.) The position of the verification code is entered in the COPIN, which is assigned per PIN type. The PIN length of the PIN type(s) using the COPIN must be observed. [Default: 1st position]

Example:

Set up modulo-N algorithmic verification for PIN type PIN2.

Relevant parameters:

• Length of PIN	5 digits
• Weighting value per digit	5 4 3 2
• Modulus	11
• Position of verif. code	5th position
• Length of verif. code	1 digit
• Calculation of verif. code	remainder of modulo-n division
• Check sum type	sum of products of (PxG)

The PIN to be checked is: 47119

					verification code
PIN:	4	7	1	1	9
	x	x	x	x	
Weighting:	5	4	3	2	1

Product:	20+	28+	3+	2	= 53
Modulo-N:	53 : 11 = 4 Rest 9				= 9
Verif. digit type = remainder = 9				PIN 47119 is valid	

(in the above example, if the modulo-N remainder were #≥10, i.e. 2 digits, the first digit would be dropped)

PERSI command examples

- Configure modulo-N algorithmic verification:
  ```
  CHANGE-
  PERSI:TYPE=MODULO,MODULO=1,VALENCE=5-4-3-2-1-1-1-1-1-
  1-1-1,TYPESUM=SUMPRO,MODULUS=11,CHKNLEN=1,TYPECHKN=RESTDIV;
  ```
- Assign modulo-N algorithm and verification code position to COPIN:
  ```
  CHANGE-
  PERSI:TYPE=COPIN,COPIN=5,PINTEST=MODULO1,POSCHKN=5;
  ```
- Set length of PIN type PIN2:
  ```
  CHANGE-PERSI:TYPE=SYS,PIN2LEN=5;
  ```

10.42.14.11 Station Number of Home/Foreign Station for CDR

You can define whether calls are to be charged to the home station number or the foreign station.

- Charge calls to foreign station number
  ```
  CHA-PERSI:TYPE=COPIN,COPIN=number,CDRRMSTN=Y;
  ```

  The chargee (station number of the home or remote node) is defined using the CDR AMOs. When the **CDRRMSTN** parameter is changed to **DISPRMSTN**, the display of the other party shows the station number of the remote station instead of the home node.

10.42.14.12 PIN/PCODE and Call Transfer (Extension)

A call set up via PIN or PCODE can be transferred to another user. There are two variants of this feature:

- PIN/PCODE of call initiator is replaced with PIN/PCODE of party to whom the call is transferred:
  ```
  CHA-PERSI:TYPE=COPIN,COPIN=number,PINEXT=N;
  ```
  - The party to whom the call is transferred does identify himself or herself via PIN. In this case, the call charges for the second stage of the call are assigned to this party.
  - The party to whom the call is transferred does not identify himself or herself via PIN. In this case, the initiator of the call is assigned the call charges for the outgoing exchange call. The PIN/PCODE of the initiator also appears in the call charge record for the second stage of the call, together with the station number of the party to whom the call was transferred.
- PIN/PCODE of call initiator is not replaced with PIN/PCODE of party to whom the call is transferred:
  ```
  CHA-PERSI:TYPE=COPIN,COPIN=number,PINEXT=Y;
  ```

  In this second case, e.g. for PCODEs, the call charges are always assigned to the call initiator, regardless of whether or not the party to whom the call is transferred has activated his/her PIN.

10.42.14.13 Detecting PIN/PCODE Hackers

In order to detect unauthorized users of PINs, the OpenScape 4000 system has a trace mechanism. The OpenScape 4000 system always assumes unauthorized use if a user attempts to enter a PIN several times over (hacking). The maximum number of permitted consecutive mistakes/retries applies to all PIN types. The station number of the hacker station at which the PIN was attempted is output on the OpenScape 4000 service terminal, together with the date and time. If a PIN is already active, the station number of the home station is output. In addition, the last unauthorized PIN is printed out. This allows you to cancel a PIN if you detect or suspect unauthorized use within your system or domain. The station at which the hacker attempted to 'break' the PIN is not blocked.

- Trace PIN hacker
  `CHA-PERSI:TYPE=COPIN,COPIN=number,TRACE=Y;`
- Define number of mistakes/retries
  `CHA-PERSI:TYPE=SYS,ATTEMPTS=number;`

10.42.14.14 Deactivation of PIN by pressing Release or Delete Key

A PIN can be configured to be active for one call only, with deactivation by pressing the release key or delete key.

- Enable deactivation of PIN via release or delete key
  `CHA-PERSI:TYPE=COPIN,COPIN=number,DEACKEY=Y;`

10.42.14.15 PIN Valid for Digit Pattern Test

If a user is identified by predialing a PIN, it is not necessary to redial the code for the digit pattern test.

- PIN type valid for digit pattern test
  `CHA-PERSI:TYPE=COPIN,COPIN=number,DPTEST=YES;`

10.42.15 Company Code\

In addition to the personal identification number (PINA), the magnetic or chip card can contain a company code of up to 4 digits. This must be entered in multi-tenant systems on a company-specific basis. The company code is specific to the ITR group but can be identical for several ITR groups. With AMO PERSI it is possible to individually assign each ITR group a company code and the pointer (position on the chip card).

- Assigning company code

  ```
  ADD-PERSI:TYPE=COCO,ITR=number,COCO=string,
  CPOINT=number;
  ```

  Remark: In V2.0 and higher, the company code is no longer necessary for smart cards and is ignored for this card type.

10.42.16 SMART Transfer Facility between Mailbox and Remote Station

Fixed call forwarding (FWD), e.g. to the voice mail service, can be configured for a mobile or "floating" (virtual) user (no advance hardware provisioning). Whenever floating users identify themselves at a "foreign" station (remote station), they can have incoming calls routed to the station by pressing the call forwarding (FWD) key. At the same time, any messages already stored in the user's mailbox are indicated by the mailbox LED. When the user deactivates the FWD, the foreign station reverts to its former operating state and the floating user's fixed call forwarding to the voice mail service is active again.

This function is possible for "floating" users and for "normal" users (COSSU value CFSWF must be assigned to user's COS).

10.42.17 PIN/PCODE for Voice and Non-Voice

The PIN/PCODE can only be entered on a voice device (Digite/Anate). It is also active for a non-voice terminal associated with the voice terminal.

10.42.18 PIN/PCODE in the Network

For call data recording purposes, the PIN is transported within the network from the station at which it was entered to the node containing the exchange/CO trunk circuit. For this purpose a buffer element must be available for each DIU B-channel (AMO DIMSU: CPDBUF).

10.42.18.1 Network-Wide PIN Usage

Users in local OpenScape 4000/HiPath 4000 networks (i.e. confined to one company building/location) are able to use the "network-wide PIN" feature (AMO FEASU) similarly to the previous system-wide PIN function, for manual PINs and chip cards. The following data and functions of a user's "home" station are available and usable at "foreign" stations in such a network:

- Individual classes-of-service for voice(COS1 / LCRCOS1)
- Internal traffic restrictions group no. (ITRGR)
- Dial plan group no. (DPLNGR)
- Mailbox LED display for voice/fax messages

The range of functions available for the network-wide PIN feature is somewhat restricted, compared to the standard, internal PIN feature. The following restrictions apply to PIN usage within the home node and in remote nodes of a network with network-wide PIN functionality:

- Follow-me function not available for all authorizations of a user's home station
- DPLN and ITR groups: the group numbers of the user's home station are used to access the appropriate lists in the remote node
- No follow-me function for repertory keys and DSS keys of a user's home station
- No follow-me function for SNR (redial) destination stored in user's home station

- No follow-me function for callback in user's home station
- No follow-me function for individual speed dialing list in user's home station
- No follow-me function for central speed dialing list in user's home station
- No follow-me function for programmed timed reminder calls
- PIN/PCODE verification against PIN/PCODE tables not possible

In cases where the follow-me function is not possible for home station data and home station memory, the data of the remote station will be used.

The "network-wide PIN" feature is intended for use in local networks (i.e. confined to one company building/location). In corporate networks distributed over different sites/locations, some limitations must be expected. The PIN types (COPIN settings) must be identically defined in all nodes of the network. In networks with open numbering schemes, users must use the node number of their home node when identifying themselves in foreign nodes. The ITR, DPLN, SPD2 and SPDC groups must be set up analogously in all nodes of the network. If the LCRCOS groups are not set up identically in all nodes of a network, outgoing connections may cause blocking of incoming calls to other nodes.

The network-wide PIN feature is intended to save having to set up separate PINs for the same users in the different nodes of a corporate network.

10.42.18.1.1 Mobile Users

In the case of mobile users (AMO-PERSI:PINTYPE=MOBILE), the home station (or virtual home station) stores the number of the foreign station at which the mobile user last logged in. This information is used to signal incoming calls or messages to the user's mailbox at the "foreign" station as well. This parameter also enables the follow-me functionality for call forwarding from the user's home station to the foreign station. If a mobile user logs in at a new foreign station without deactivating his PIN at the previous station, the first activation is deleted, i.e. it is only possible for a user's PIN to be active at one station at a time.

- Assign a PIN type for mobile users:
  `CHA-PERSI:TYPE=COPIN,COPIN=number,COTYPE=MOBILE;`

10.42.18.1.2 Configuration Commands for Network-Wide PIN

The following commands are necessary for the network-wide PIN feature.

- Enable feature
  `CHANGE-FEASU:TYPE=A,CM=PINNW;`
- Define number of buffer elements required for network-wide PIN: Formula: number of PINBUFs = max. no. users times 2
  `ADD-DIMSU:TYPE=USER,PINBUF=number;`
- Assign COT for network-wide PIN usage:
  `CHANGE-COT:COTNO=number,COTTYPE=COTADD,PAR=PINR;`
- When the user number (virtual station) should be sent as E164, then the COT parameter **NPIS** must be set:
  `CHA-COT:COTNO=number,COTTYPE=COTADD,PAR=`**`NPIS`**`;`

10.42.18.1.3 Configuration Commands for Follow-Me Function (with Netw-Wide PIN)

The follow-me function allows calls to be forwarded from the home station to the remote station at which they have logged on. The following commands are necessary

- Assign COT for network-wide call forwarding:
  `CHANGE-COT:COTNO=number,COTTYPE=COTADD,PAR=FWDN;`

10.42.18.2 PIN and Follow-Me in 1 Step

Activating PIN-lang may automatically activate the follow-me function. This function is automatically deactivated when you deactivate the PIN.

PIN and follow-me 1 step should be configured in the home station's COS.

1) `CHA-COSSU:TYPE=COS,COS=number,AVCE=CFSWF&PINAFM;`

Remark: PIN and follow-me 1 step only work in Digites and for network-wide PINs. Internal PINs and Anates are not supported.

10.42.19 Restart Security of PIN/PCODE

Identification by means of a PIN/PCODE is not affected by soft or hard restart or by a processor changeover (in duplex systems); this does not apply to reloading. This security function is only required for a PIN/PCODE if the PIN/PCODE is active for longer than the duration of a call, i.e. for the card as well.

Any class of service changeover between the two COS is also saved.

10.43 PNT E for Connecting Standardized S0 Telephones

10.43.1 Feature Description

To connect standardized S0 telephones to the UP0E interface of the SLMO, use the "UP0E to S0" adapter box PNT E. This allows you to operate S0 telephones on the UP0E interface of the SLMO.

The OpenScape 4000 Administration does not recognize the PNT E. Configure it like an optiset E telephone, making sure that there is enough DTISO DIMEN memory.

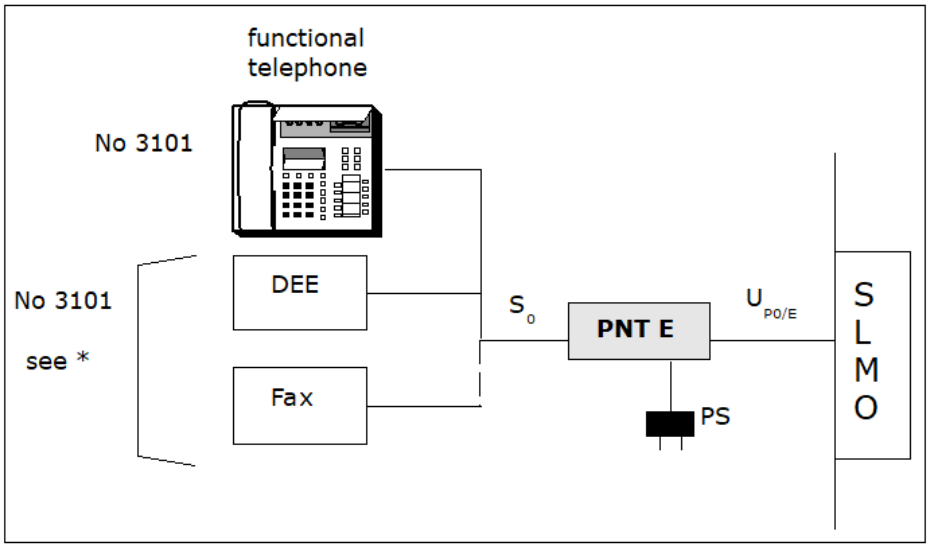
When you make an OPTIDAT request using AMO SBCSU, you will not find an PNT E; the PNT E reports as an "optiset E basic".

IMPORTANT: You can connect a maximum of two reporting sources (Telephones with S0 interfaces that conform to the ITU Recommendation I.430 or Q920/921).

IMPORTANT: In place of an optiset E telephone as representative for PNT E, you can also configure an optiPoint 500 (DVCFIG=OPTIP500), which the system then automatically changes into an optiset E.

IMPORTANT: To supply the S0 telephones without a separate power supply, you need an additional power supply unit.

10.43.2 PNT E for Connecting Functional Station Devices



* You can configure another NV service of your choice under the calling number 3101. To do this, you must specify the service (DTE, FAX) in the DVCFIG parameter, a type of protocol in the parameter F/DPROT, and an option index in the parameter F/DOPTIDX.

- Configure optiset E telephone as a representative for PNT E:

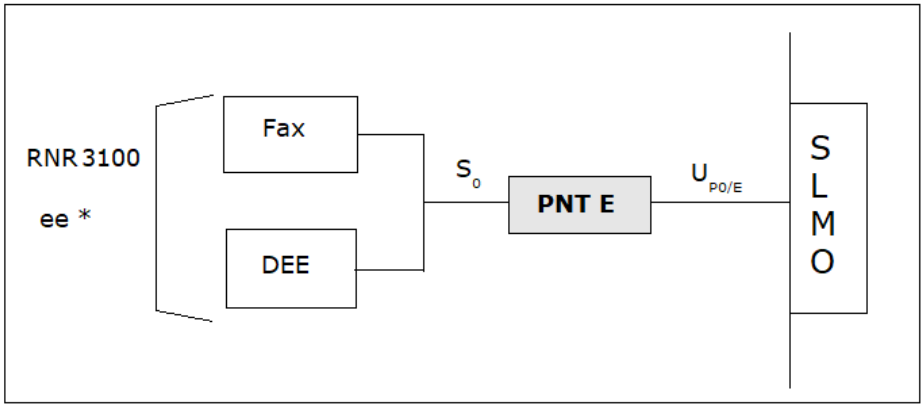
```
ADD-SBCSU:SSTNO=3100,OPT=OPTI,CONN=DIR,PEN=number,
DVCFIG=OPTISET,COS1=number,COS2=number,LCOSV1=number,
LCOSV2=number,LCOSD1=number,LCOSD2=number;
```

IMPORTANT: Physically, there is no system telephone with the number 3100.

- Configure functional station devices:

```
ADD-SBCSU:SSTNO=3101,OPT=OPTIEXP,MAINO=3100,
DVCFIG=SET600[&DTE/FAX],SPROT=param,
SOPTIDX=number[,FPROT=param][,FOPTIDX=number]
[,DPROT=param][,DOPTIDX=number];
```

10.43.3 PNT E for Connecting Functional NV Station Devices



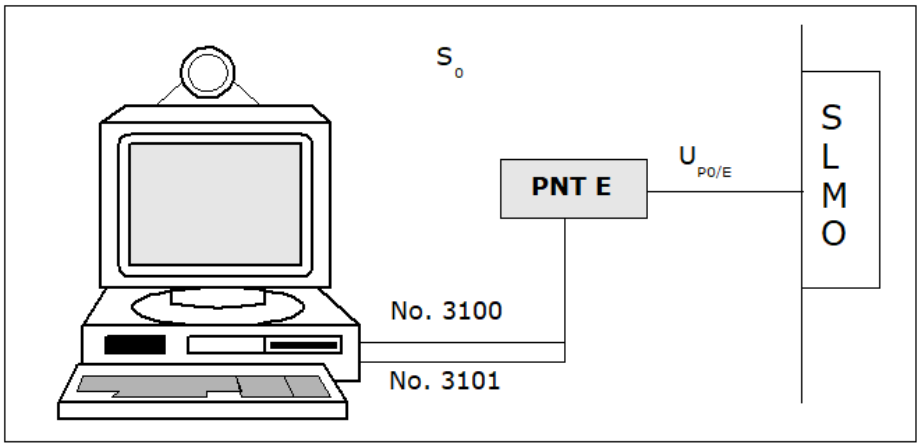
You can configure two functional NV station devices under the calling number 3100 with any service that you want. To do this, you must specify the service (DTE, FAX) in the DVCFIG parameter, a type of protocol in XPROT, and an option index with the parameter xOPTIDX (see parameter specifications in the optional brackets).

- Configure optiset E telephone (as representative for PNT E) and functional NV services:

```
ADD-SBCSU:SSTNO=3100,OPT=OPTI,CONN=DIR,PEN=number,
DVCFIG=OPTISET[&DTE]&[FAX],COS1=number,COS2=number,
LCOSV1=number,LCOSV2=number,LCOSD1=number,LCOSD2=number
[,DPROT=param][,FPROT=param][,DOPTIDX=number]
[,FOPTIDX=number];
```

IMPORTANT: You cannot configure a functional voice device on this port (not even with MSN).

10.43.4 PNT E for Connecting Video Conference Equipment With Two Calling Numbers



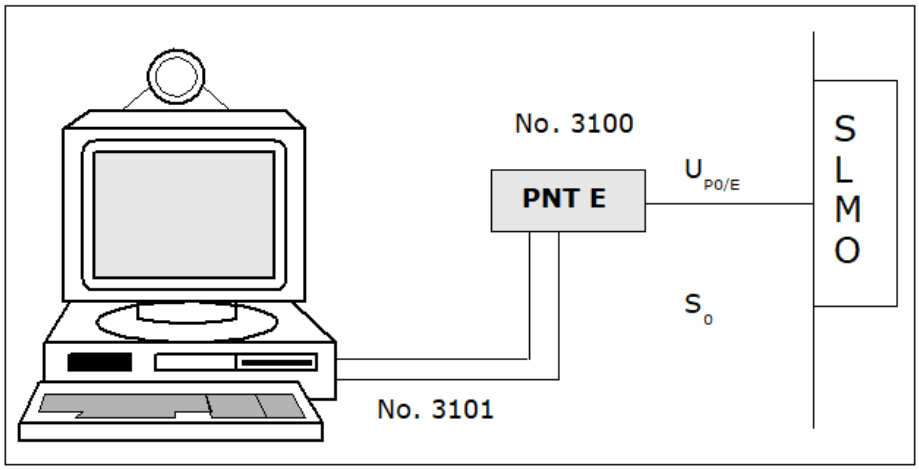
IMPORTANT: Configure the two B channels for the video conference equipment as functional DTEs under the calling numbers 3100 and 3101. You must configure the second calling number with MSN.

- Configure an optiset E telephone (as a representative for PNT E) with functional DTE as follows:

  ```
  ADD-SBCSU:SSTNO=3100,OPT=OPTI,CONN=DIR,PEN=number,
  DVCFIG=OPTISET&DTE,COS1=number,COS2=number,
  LCOSV1=number,LCOSV2=number,LCOSD1=number,
  LCOSD2=number,DPROT=param,DOPTIDX=number;
  ```

- Configure the second calling number for the video conference using MSN as follows:
  ```
  ADD-SBCSU:SSTNO=3101,OPT=MSN,MAINO=3100;
  ```

10.43.5 PNT E With Channel Bundling for NV Station Device



IMPORTANT: To avoid reserving a B channel for voice, you must configure the PNT E with OPTISET and another calling number with OPTIEXP (No. 3100 is thus a service number for PNT E configuration).

- Configure an optiset E telephone (as the representative for PNT E) as follows:

```
ADD-SBCSU:SSTNO=3100,OPT=OPTI,CONN=DIR,PEN=number,
DVCFIG=OPTISET,COS1=number,COS2=number,LCOSV1=number,
LCOSV2=number,LCOSD1=number,LCOSD2=number;
```

- Configure the calling number 3101 for channel bundling as follows (for example, for all services): (Set MULTRA in the COS to be able to use both B channels under one calling number)

```
ADD-SBCSU:SSTNO=3101,OPT=OPTIEXP,MAINO=3100,
DVCFIG=SET600&DTE&FAX,COS1=number,COS2=number,
LCOSV1=number,LCOSV2=number,LCOSD1=number,
LCOSD2=number,SPROT=SBDSS1,FPROT=SBDSS1,
DPROT=SBDSS1,RCBKB=NO,RCBKNA=NO,SOPTIDX=10,
FOPTIDX=10,DOPTIDX=10;
```

10.44 Public Address System

10.44.1 Feature Description

This feature (also called Voice Paging) allows the customer to have dialing access to a public address system. The customer provides the loudspeaker voice paging equipment, which can be connected to the OpenScape 4000 several ways:

- Analog circuits on a SLMA
- Analog circuits on a TMOM (not available for customers in the United States)

- Analog circuits on TIE or CO trunk

10.44.2 User interface

10.44.2.1 SLMA Access

The customer dials the access number for the voice paging circuit and is automatically connected.

The voice paging circuit can be dialed from basic call or consultation dial states.

However, depending on the method of configuration (refer to Section 134.4.1 on page 134-1371), most features may not be permitted when connected to voice paging equipment. For example, the following features may NOT be permitted. This is new for OpenScape 4000.

- conference
- transfer
- call forward to voice page destination
- toggle
- park
- any type of hold
- callback
- message waiting
- override
- camp-on

10.44.2.2 TMOM Access

- Interface for the connection of a public address system with amplifier with one or more loudspeakers.
- An announcement over the public address system can be activated using the standard procedure.
  - It can also be seized in consultation status.
  - The announcement over the public address system can be ended by releasing the connection to the calling station.
- A maximum of 100% of users can be authorized to make announcements over the public address system. Users are given the appropriate class-of-service with the aid of administration and maintenance.
- The voice paging system can be seized by
  - internal station users,
  - the attendant console if the public address system is not connected via TMOM
  - station users of the remote PABX via a station line.

10.44.2.3 TIE or CO trunk Access

It is possible to connect voice paging equipment to the OpenScape 4000 via TIE or CO trunk boards (e.g. TMC16 or TMEMUS). The trunks are configured in the normal way (independent of voice paging). However, the OpenScape 4000 in this case will be unaware that the trunks are connected to special equipment, and will therefore be unable to block the activation of features.

10.44.3 Service information

Voice Paging via the TMOM board is not possible for customers in the United States, since this board is not available in the United States.

10.44.4 Generation (Example)

10.44.4.1 SLMA Access

- Configure the SLMA2 board:

  ```
  ADD-BCSU:MTYPE=PER,LTG=ltg,LTU=ltu,SLOT=slot,
  PARTNO=partno;
  ```

If features are to be blocked (new for OpenScape 4000):

- Assign the voice paging device (only significant parameters for voice paging are shown - other parameters such as COS1, etc. must also be given a value):

  ```
  ADD-SCSU:STNO=number,DVCFIG=ANATE,
  SPEC=VCEPAGE&SUFDIAL,DIAL=DTMF;
  ```

If features are not to be blocked:

- Assign the voice paging device (only significant parameters for voice paging are shown - other parameters such as COS1, etc. must also be given a value):

  ```
  ADD-SCSU:STNO=number,DVCFIG=ANATE,
  SPEC=SSTN&SUFDIAL,DIAL=DTMF;
  ```

10.44.4.2 TMOM Access

One circuit is configured on the TMOM module per public address system.

- Assign TMOM module

  ```
  AD-BCSU:MTYPE=PER,LTU=number,SLOT=number,
  PARTNO=string;
  ```
- Assign code for public address system
  ```
  AD-WABE:CD=key-num,DAR=RA;
  ```

- Add class of trunk
  `AD-COT:PAR=NTON;`
- Assign the class of parameter
  `AD-COP:PAR=SACK&LSUP;`
- Add trunk group
  `AD-BUEND:NO=number;`
- Add trunk circuit

  `AD-TSCSU:COTNO=number,TGRP=number,DEV=SPKR,`
  `COPNO=number,SUPV=SUPV2,ACKT=SZACK2;`
- Assign a route to the public address system

  `AD-RICHT:TYPE=CD,CD=key-num,SVC=VCE,TGRP1=number;`

10.44.4.3 TIE or CO Trunk Access

No special configuration other than the usual trunk and routing assignments.

10.44.5 Relevant AMOs

The below AMO parameter is new for OpenScape 4000.

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
SCSU	SOND	d	The values LPSE and NAWA ARE needed for voice paging
SCSU	SPEC	e	The values VCEPAGE and SUFDIAL are needed for voice paging

10.45 Redial

10.45.1 Saved Number Recall

Each user (STN) as well as each attendant terminal (ATND) can store a dialled number of up to 22 digits for redialling at a later time. This function also includes a 'notebook function', i.e. a number can be entered and stored during a call. When the database is regenerated the stored redial number is saved. For analog stations a code digit must be defined for the '*' and '#' keys.

10.45.1.1 Generation

- Release feature
  `CHA-FEASU:TYPE=A,`**`CM=SNR;`**
- Assign the key for saved number redial to a subscriber:
  `CHANGE-TAPRO:STNO=number,KYxx=SNR`

- Assign the code for saved number redial
  `AD-WABE:CD=key-num,DAR=SNR;`

10.45.2 Last Number Redialing

Another kind of number redial is that of redialling the last dialled station number. This station number is automatically stored and cannot be changed by the user. To redial the last dialled number requires a special key or a code.

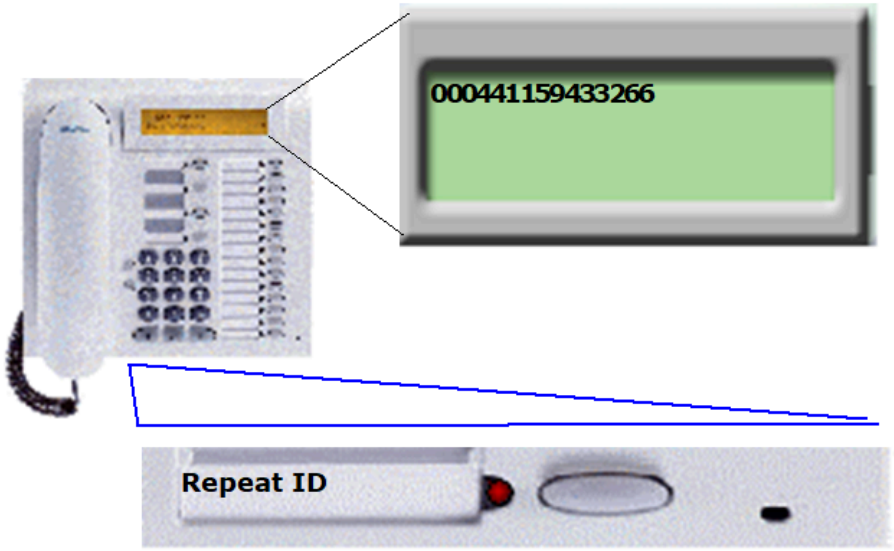
10.45.2.1 Generation

- Release feature for **Last number Redialing**:

  This feature is activated either by a **LAST-NUMBER-REDIAL** key on DIGITE or by dialling the **LNR** code with ANATE.
  `CHA-ZAND:TYPE=ALLDATA2,LNR=YES;`
- Assign the key for last number redial:
  `CHANGE-TAPRO:STNO=number,KYxx=LNR;`
- Configure the code for number redial of the last dialled number:
  `ADD-WABE:CD=key-num,DAR=LNR;`

10.46 Repeat ID Key

The repeat ID feature allows the user to see the calling/called party information presented again to the display after it has timed out.



10.46.1 Feature Description

The Repeat ID key is an optional feature key that can be assigned to any Keyset or Digite with a display. The station user can depress this key while in talk state to display calling and/or called party information.

10.46.2 User Interface

Activation Sequences

Repeat ID of a connection the user is active on

- If TALK or CONFERENCE -

  Press REPEAT ID Key:

  – In case of keyset on the first line of display the partner ID is shown (called/connected/calling party) and on the second line of display the used line ID is shown.
  – In case of non keyset, on the first line of display the partner ID is shown (called/connected/calling party) and on the second line the own number is shown.

Deactivation Sequences

- Time-out: There is a 8 second display timeout (administrable) for Repeat ID
- The display given upon initiation of Repeat ID may be overwritten by other user requested or features at the user's telephone.
- Upon initialization or re-initialization of the telephone.

10.46.3 Service Information

The Repeat ID feature is intended for the global marketplace.

10.46.4 Generation (Example)

- To add a Repeat I.D. Key to a station
  `CHANGE-TAPRO:STNO=7445,DIGTYP=OPTIT19,KY18=RPTID;`
- To vary the timer for the display of the I.D.
  `CHANGE-DTIM1:TYPEDH=DIGITE,CTPRESEL=20;`

  Note: This timer also has the function of determining the preselection time for manual line selection with Keysets

10.46.5 Relevant AMOs

AMO	Parameter	Language	Description
TAPRO	TDnn	d	
	KYnn	e	The new key (nn) is called RPTID
DTIM1	KDPRESEL	d	
	CTPRESEL	e	Parameter is used to set the RPTID display duration

10.47 S2 Station Configuration

10.47.1 Feature Description

Servers, routers, MCU and similar equipment can be connected to OpenScape 4000 as a tie line or station. From the point of view of the protocol it is better to install these stations with SBCSU because in this case OpenScape 4000 offers the network part of the protocol and the terminal provides the user part. With tie line signaling differences frequently occur in the protocol if the terminal has not actually implemented the protocol for it. If more than one extension number is needed for the connection these are provided with MSN.

10.47.2 Service Information

- There is no permanent allocation of extension numbers to B channels.
- The CRC4 test is activated and deactivated with the parameter QUAL (AMO LWPAR).
- In a configuration with another device, the OpenScape 4000 should be set as master for clocking and layer 2 (AMO LWPAR).
- This is a point-to-point connection, in other words there is only one terminal connected to the port.
- If you do not use MSNs but still want to be able to reach the connected device several times using the primary station number, set the parameter MULTRA in the associated COS for the relevant primary station number service.

10.47.3 Generation (Example)

To be able to configure an S2 station, a corresponding board must be configured and free in the system (with S2 port). In addition, the appropriate number of station numbers must be entered in the DPLN. Below is an example of a connection in the form of a station with 30 MSN numbers.

- Set up an S2 primary station number (3581):

```
ADD-SBCSU:STNO=3581,OPT=FPP,CONN=DIR,PEN=1-5-37-0,
DVCFIG=S2PP,COS1=23,COS2=23,LCOSV1=1,LCOSV2=1,
LCOSD1=1,LCOSD2=1,PROT=SBDSS1,PERMACT=Y,OPTIDX=10;
```

- Set an MSN as the primary station number (if multiple numbers are needed for S2):

```
ADD-SBCSU:STNO=3600&&3629,OPT=MSN,MAINO=3581,
COS1=23,COS2=23,LCOSV1=1,LCOSV2=1,LCOSD1=1,
LCOSD2=1;
```

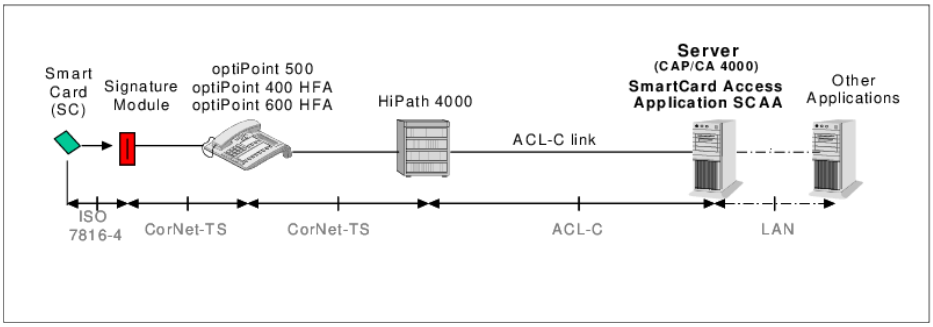
10.47.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
SBCSU	ART	d	ANGABE DES BUSTYPS ODER DER ZU ERWEITERNDEN EINHEIT (ART=FPP HAUPTRUFNUMMER DES S0-/S2-PUNKT-PUNKT-ANSCHLUSS ART=MSN MSN-RUFNUMMER)
	OPT	e	SPECIFICATION OF BUS TYPE OR UNIT TO BE EXPANDED (OPT=FPP FUNCTIONAL POINT-TO-POINT CONNECTION OPT=MSN MSN STATION NUMBER)
	ANSCHL	d	ANSCHLUSS-ART DER GERAETE (ANSCHL=DIR DIREKTER ANSCHLUSS)
	CONN	e	DEVICE CONNECTION TYPE (CONN=DIR DIRECT CONNECTION)
	GERKON	d	GERAETE-KONSTELLATION EINES TEILNEHMERS (GERKON=S2PP S2-PUNKT-PUNKT-ANSCHLUSS, 30 B-KANAELE)
	DVCFIG	e	DEVICE CONFIGURATION (DVCFIG=S2PP S2 POINT-TO-POINT)
	OPT	d	INDEX AUF OPTIONSTABELLE (OPT=9 Optionsindex S2 Endgeräte, für alle funktionalen Protokolle)
	OPTIDX	e	INDEX INTO OPTION TABLE (OPT=9 Optionindex S2 TE)
	PROT	d	PROTOKOLLVARIANTE
	PROT	e	PROTOCOL VARIANT
	TLNNU	d	TEILNEHMER-RUFNUMMER
	STNO	e	STATION NUMBER
	HAUPTNU	d	HAUPT-RUFNUMMER
	MAINO	e	PRIMARY STATION NUMBER

10.48 Smart Card Application

10.48.1 Feature Description

You can connect a signature module (Smart Card Reader) to an optiPoint 500/600 telephone (Up0E interface) as well as to an optiPoint 410/600 HFA IP phone.



A smart card can be inserted into a signature module and is authenticated by the SmartCard Access Application (SCAA) that runs on a server connected to the OpenScape 4000 over the CAP/CA4000. Once authenticated by the SmartCard Access Application (SCAA), you can access any applications that communicate with the SCAA application on the server.

The Smart Card Application:

- supports smart cards that comply with the standard ISO 7816, parts 1-4.
- supports the Local Security Check Procedure which requires users to enter an ID over the telephone's keypad and display to prove their identity as card owner.
- provides a connection over OpenScape 4000 between the signature module and the SmartCard Access Application (SCAA) on the server to record smart card insertion and removal, control the Local Security Check Procedure (LSCP), perform authentication and provide user guidance for using the smart card with the SmartCard Access Application (SCAA).
- supports the AMU - Mobile Station application for activating the OpenScape 4000 PIN.

10.48.2 User Interface

The smart card can be inserted or removed in any telephone state (free, busy, etc.).

You can manipulate the user interface to identify a user on the basis of a smart card (Local Security Check Procedure) and card ID with the help of the SmartCard Access Application (SCAA).

The SmartCard Access Application (SCAA) switches the telephone to non-voice state (the non-voice LED lights up) to let you manipulate the display.

The smart card ID digits entered are not shown on the display. The end-of-dialing criterion (end-of-dialing code, such as, "#" or number of ID digits) can be set in the SmartCard Access Application (SCAA).

Following successful authentication, the SmartCard Access Application (SCAA) starts up an application on the server that in turn activates the "mobile station" feature for the user that used the smart card for identification and

authentication. In contrast to Optiset E chip cards, you no longer need to enter a station number for smart cards.

Once a smart card is inserted and the "mobile station" feature is successfully activated, the privileges and properties (membership of DPLN groups, ITR groups, etc.) associated with the smart card user can be used for the next call or station activities. This also applies if you insert a smart card during a connection that was established with another smart card or "Manual PIN".

10.48.3 Service Information

Remark:

This feature description does not include a description of the Smart Card Access Application (SCAA).

10.48.4 Generation (Example)

Enabling the SmartCard Feature in the System

```
CHA-FEASU:TYPE=A,CM=SMARTCRD;
```

If the DP Application SCAA (here applno=61) Already Exists:

To add a SmartCard Access Application link, enter:

```
CHA-XAPPL:CTYPE=APPL,APPLNO=61,SECAPPL=111;
```

If the DP Application SCAA Does Not Yet Exist

To configure a DP application and SmartCard Access Application link, enter (in the case of dpappl, you must specify the application name used in the AMO CPTP - here, for example, "SCAA"):

```
ADD-XAPPL:APPLNO=61,DPAPPL="SCAA",
NAME="APPLICATION22",SECAPPL=111;
```

NOTICE: You can use the parameter secappl to configure up to 20 SmartCard Access Application links.

If the Station Already Exists:

- To configure the signature module (SmartCard Reader) afterwards at the station, enter:
  `CHA-SBCSU:STNO=3456,IDCR=Y;`
- To assign a SmartCard Access Application link to the station, enter:
  `CHA-SBCSU:STNO=3456,SECAPPL=111;`
- To set "Mobile User Activation over SCAA/AMU" at the station, enter:
  `CHA-SBCSU:STNO=3456,APMOBUSR=Y;`
- or to combine all steps:

  ```
  CHA-SBCSU:STNO=3456,IDCR=Y,APMOBUSR=Y,SECAPPL=111;
  ```

If a Station Does Not Yet Exist:

```
ADD-SBCSU:STNO=3456,OPT=OPTI,...,IDCR=Y,APMOBUSR=Y,
SECAPPL=111;
```

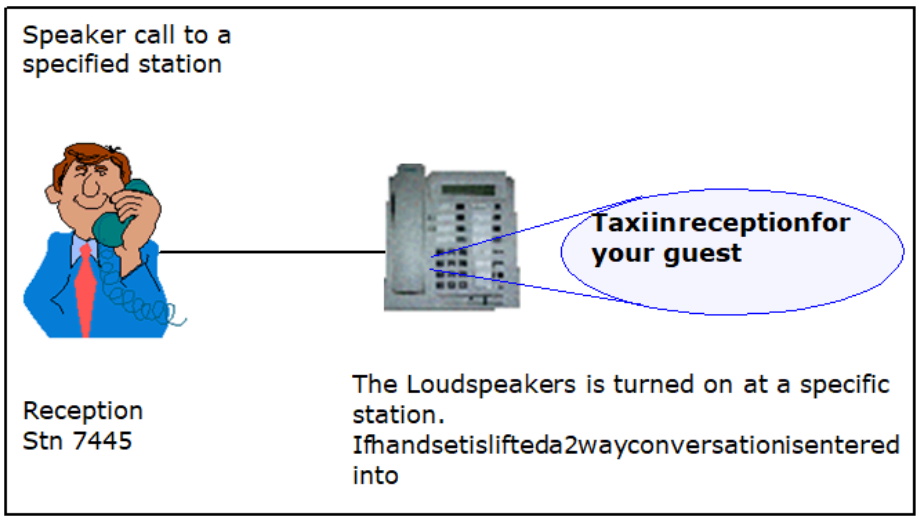
10.48.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
FEASU	smartcrd	d	Leistungsmerkmal SmartCard im System freischalten
FEASU	smartcrd	e	Activate SmartCard feature usage system wide
SBCSU	secappl	d	SmartCard Access Application Link zuweisen
SBCSU	secappl	e	Assign SmartCard Access Application Link
SBCSU	apmobusr	d	Aktivierung Mobile User über SCAA/AMU
SBCSU	apmobusr	e	Mobile User Activation via SCAA/AMU
XAPPL	secappl	d	SmartCard Access Application Link einrichten
XAPPL	secappl	e	Create SmartCard Access Application Link

10.49 Speaker Call - One-Way

10.49.1 Overview

The feature "Speaker Call - One Way" is the migration from the U.S. speaker function and the I.M. voice call function.



10.49.2 Feature Description

The feature "Speaker Call - One Way" provides the capability to allow an analog telephone, **d**igital **f**eature **t**elephone (DFT), or Keyset user to initiate a speaker call which provides a one-way connection to a single destination (prime line) of their choice.

Upon the destination lifting the handset, the call is converted to a normal two-way call.

10.49.3 User Interface

- The user may either depress a key (**SPKRCALL**) or dial an access code (SPKRCALL), followed by dialing a destination extension number, to initiate a "Speaker Call - One-Way" call. A one-way connection shall immediately be established between the user and the dialed destination, if the following criteria are met:
  - The destination is not busy, not off-hook, not in hands-free operation, and is not in program mode.
  - The destination is not marked for voice call protection.
  - The station is not restricted from terminating to that destination (e.g. ITR Internal Traffic Restriction).
- An external dial tone shall alert the originator that the one-way connection has been established, and that the one-way call can begin.
- The one-way connection shall be converted to a single two-way connection upon the destination's going off hook, via the handset only.
- A "Speaker Call - One way" call can be initiated by an analog or digital telephone.
- When the destination party presses the speaker key, the call will be disconnected.
- When the destination party presses a line key (either the one on which the call is pending, or any other line key), the call will be disconnected.

10.49.4 Service Information

The "Speaker Call - One Way" feature is intended for the global marketplace.

10.49.5 Generation (Example)

How to add the "Speaker Call - One Way" feature into the system:

- How to configure the originating station to have access to the feature:
  `CHA-SDAT:STNO=7445,TYPE=ATTRIBUT,AATTR=SPKRCALL;`
- Add the digits for dial access to the feature:
  `ADD-WABE:CD=*54,DAR=SPKRCALL;`
- Add the feature key to a phone:
  `CHA-TAPRO:STNO=7445,KY04=SPKRCALL;`

10.49.6 Relevant AMOs

AMO	Parameter	Language	Description
SDAT	SPKRCALL	d	direktansprechen simplex
	SPKRCALL	e	speaker call - one way
TAPRO	SPKRCALL	d	direktansprechen simplex
	SPKRCALL	e	speaker call - one way
WABE	SPKRCALL	d	direktansprechen simplex
	SPKRCALL	e	speaker call - one way

10.50 Special Ring Tone depending on Caller

For certain types of call, a special ring can be signalled at the called terminal (triple cadence). This is possible for internal calls and consultation calls within the same node.

- The calling party must be assigned either an off-hook recall classmark in the COS
  `CHA-COSSU:TYPE=COS,COS=number,AVCE=OFHKRC;`

  or an off-hook recall attribute in SDAT
  `CHA-SDAT: STNO=number,TYPE=ATTRIBUTE,AATTR=OFHKRC;`
- The calling party must also not have any HOTIDX assigned. Check as follows:
  `DIS-SDAT:STNO=number,TYPE=SUBDATA;`
- The special ring type is set with the AMO ZAND.
  `CHA-ZAND:TYPE=RNGTYPE,PRI=TRPR;`

  Instead of TRPR, a different special ring may be assigned (see parameter values for PRI in AMO description of AMO ZAND).

10.51 Speed Dialling

10.51.1 Speed dialing, individual

10.51.1.1 Overview

This feature permits individual storing of a maximum of 10, 20, or 30 arbitrary digit sequences, each comprising up to 22 digits, at any ANATE or DIGITE, but not at the attendant terminal. Destinations are stored in a memory which is set up with the AMOs SCSU/SBCSU/SSCSU, by declaring parameter SPDI=0, 10, 20, or 30 when the port is assigned (action **ADD**) or the number of SPDI is increased/decreased for an existing port (action **CHANGE**).

Destinations are entered either at the service terminal with the ZIEL AMO or at the user's telephone by means of a dialing procedure.

10.51.1.2 Generation

- Add an SPDI destination
  ```
  AD-
  ZIEL:TYPE=SPDI,SRCNO=number,SPDNO=number,DESTNOR=number;
  ```
- Add an SPDI key
  ```
  CHA-TAPRO:STNO=number, KYxx=SPDI;
  ```

10.51.2 Speed Dialing, Central (SPDC)

The SPDC is conceived for up to 10000 destinations that can be distributed as desired among a maximum of 16 speed dialing lists. Each list can continue a maximum of 1000 destinations. Each terminal/port can be allocated up to 2 lists with the AMO SCSU, SBCSU, or SSCSU. These are lists 0 to 15.

If only one speed dialing access code is assigned in the dial plan (only DAR=SPDC1 is assigned by AMO WABE), the speed dialing indexes assigned in the first list of any terminal/port should not overlap the indexes assigned in the second list of the same terminal/port. The lowest index in the second list should be a higher number than the highest index assigned in the first list. The number of digits of the indexes of the first and second list have to be the same. These prerequisites (no overlapping, correct order of indices of the first and second list) are not checked by any AMO, but have to be assured by the service personnel. Users can access up to 1000 speed-dialing numbers. If there are overlapping indexes, the indexes of the first list cover the indexes of the second list. Despite the fact that the covered indexes of the second list cannot be accessed via access code (DAR=SPDC1) they can be accessed via speed dialing keys, however.

If two speed dialing codes are assigned in the dial plan (DAR=SPDC1 and DAR=SPDC2 are assigned by AMO WABE), the speed dialing indexes can be assigned more than once. Users can access up to 2000 speed dialing numbers.

Speed dialing destinations can have up to 22 digits; any digit sequence can be entered. Special characters, i.e. asterisk and hash, are also allowed as part of the destination number. For automatic suffix dialing it is possible to specify the number of digits that have to be transmitted with a delay, e.g.: unabbreviated call number 0897220 SUPDIAL=1 will dial 089722 immediately and the last 0 only if no suffix dialing followed the SPDI dialing.

- Create a central speed dialing list
  `AD-LRNGZ:LST=number,SPDMIN=number,SPDMAX=number;`
- Assign a destination to an SPDC list (existing destination is overwritten)
  `AD-ZRNGZ:LST=number,SPDNO=number,DESTNO=number;`
- Assign central speed dialing keys
  `CHA-TAPRO:STNO=number,KYxx=SYSSP1,KYxx=SYSSP2;`

10.51.3 Extended functions for central speed dialing

Two alternative, customer-specific features for central speed dialing can be activated: namely 4-digit or 5-digit central speed dialing. The only change involves activation with the AMO ZAND.

The 5-digit version allows the first two dialed digits to be converted to an index to one of the 16 central speed dialing lists with the aid of a conversion table. This permits a speed dialing facility to be set up, for example, in which a 5-digit customer number is used to represent the customer's unabbreviated call number.

The conversion table must be patched on a customer-specific basis (refer to section "Entering the customer-specific data for the 5-digit speed dialing facility").

10.51.3.1 4-digit speed dialing facility

The abbreviated call number which is dialed must have 4 digits, of which the first determines the central speed dialing list. This must be reflected by the organization of these lists.

Example: The code for seizing the central speed dialing facility (*1) must be dialed, followed by the abbreviated call number (2357).

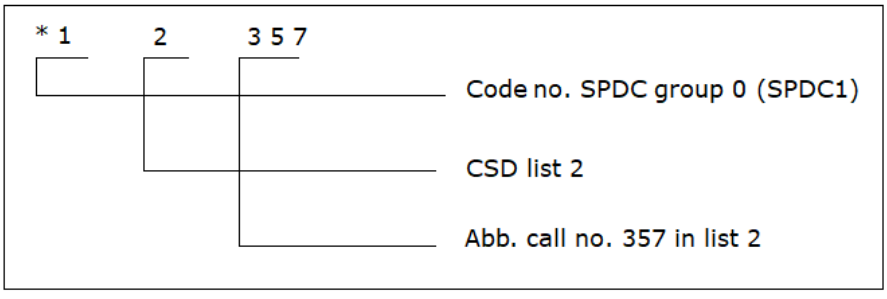


Figure 111: Example for the 4-digit speed dialing facility

1) Enable system with 4-digit speed dialing facility:
`CHANGE-ZAND:TYPE=ALLDATA2,CSDZTYPE=4DIG;`

2) All stations wishing to use the 4-digit speed dialing facility must have entered group 0 under SPDC1 (e.g. AMO SCSU).
3) Digit analysis results SPDC1 and SPDC2 must have been created in the digit analysis (AMO WABE).
4) Central speed dialing lists 0 to 9 must have been created with the AMO LRNGZ. The first abbreviated call number in each list is 000, max. 1000 entries.

IMPORTANT: Lists 0 to 9 must still be created if fewer than 10 lists are used, as otherwise the system will fail if the station dials a wrong number. The reason for this is that when a speed dialing list is dialed, the system always assumes that it actually exists. Any lists which are not required can remain empty, however.

---

5) Lists 1 - 16 can be assigned to speed dialing groups 1 - 16 if necessary. The lists are allowed to overlap, i.e. even if they are already being used for the 4-digit central speed dialing facility, lists 1 - 9 can still be used for speed dialing groups 1 - 9. Only a 3-digit number is dialed by these groups, however!
6) Activating/deactivating the 4-digit speed dialing facility

   The various features of the central speed dialing facility are switched on or off with the AMO ZAND. The normal speed dialing facility is activated in the initial state.

   In the branch TYPE = ALLDATA2 of the action 'CHANGE' the parameter CSDTYPE=4DIG must be set to activate the 4-digit CSD. The standard CSD is available with CSDTYPE=STANDARD.

10.51.3.2 5-digit speed dialing facility

The abbreviated call number which is dialed must have 5 digits, of which the first two are converted to a valid speed dialing list number with the aid of a conversion table. This table contains 100 entries, which means that the range of converted index numbers extends from 00 to 99. The basic initialization includes a NULL value, so that any digits which are dialed incorrectly by the station do not result in an addressing error. The basic initialization is activated with a DB routine during the generation procedure.

Example: The code for seizing the central speed dialing facility (*1) must be dialed, followed by the abbreviated call number (19357).

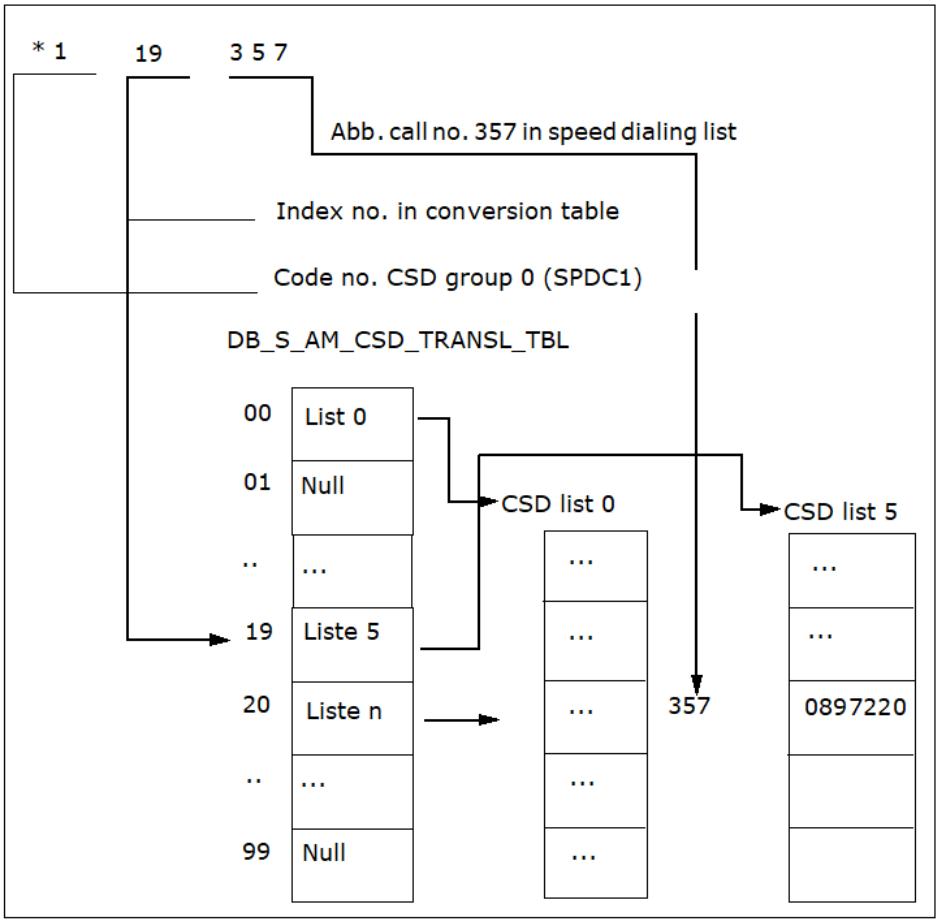


Figure 112: Example for the 5-digit speed dialing facility

1) All stations wishing to use the 5-digit speed dialing facility must have entered group 0 under SPDC1 (e.g. AMO SCSU).

2) Digit analysis results SPDC1 and SPDC2 must have been created in the digit analysis (AMO WABE).

3) The central speed dialing lists to which the conversion table refers must have been created with the AMO LRNGZ. If no such lists exist, an addressing error will occur. The first abbreviated call number in each list is 000, in other words 3 digits. The assignment of the speed dialing lists is completely flexible, for example a list can be referred to by several different index numbers or by all index numbers.

4) Lists 1 - 16 can be assigned to speed dialing groups 1 - 16 if necessary. The lists are allowed to overlap, i.e. even if they are already being used for the 5-digit central speed dialing facility, the lists can still be used for the speed dialing groups. Only a 3-digit number is dialed by these groups, however!

5) Activating/deactivating the 5-digit speed dialing facility

The various features of the central speed dialing facility are switched on or off with the AMO ZAND. The normal speed dialing facility is activated in the initial state.

In the branch TYPE = ALLDATA2 of the action 'CHANGE' the parameter CSDTYPE=5DIG must be set to activate the 5-digit CSD. The standard CSD is available with CSDTYPE=STANDARD.

Entering the customer-specific data for the 5-digit speed dialing facility

The customer-specific data, i.e. the assignment of the 2-digit index to a reference to one of the speed dialing lists which has been created, is defined after (!) the system has been generated in the DB_S_AM_CSD_TRANSL_TBL. This table was initialized with NULL values during the generation procedure, so that there are no indices which refer to a speed dialing list.

With the AMO DEBUG the SD list for the TABLE INDEX can then be entered at a certain address (see following Table 64).

Table 62: 5-digit speed dialing facitlity - Debug address for index table

Address (derived from DB_S_AM_CSD_TRANSL_TBL)		Speed dial list	Table index
HiPath 4000 V6	OpenScape 4000 V7/V8		
4F20:36AE	4F20:7876	0...15, 32	00
4F20:36AF	4F20:7877	0...15, 32	01
4F20:36B0	4F20:7878	0...15, 32	02
4F20:36B1	4F20:7879	0...15, 32	03
4F20:36B2	4F20:787A	0...15, 32	04
4F20:36E7	4F20:78AF	0...15, 32	57
4F20:36E8	4F20:78B0	0...15, 32	58
4F20:36E9	4F20:78B1	0...15, 32	59
4F20:36EA	4F20:78B2	0...15, 32	60
4F20:36EB	4F20:78B3	0...15, 32	61
4F20:370D	4F20:78D5	0...15, 32	95
4F20:370E	4F20:78D6	0...15, 32	96
4F20:370F	4F20:78D7	0...15, 32	97
4F20:3710	4F20:78D8	0...15, 32	98
4F20:3711	4F20:78D9	0...15, 32	99

Example:

The abbreviated call number 58123 must be created. The unabbreviated call number has been created as SPDNO=123 in speed dialing list 2 using the AMO ZRNGZ. The value 2 must now be entered at index 58 with AMO DEBUG.

1) "SET 4EF0:BB7C(1)=T'02!";

If an entry needs to be deleted again, the value 32 must be entered at the appropriate address.

IMPORTANT: A reference in the conversion table to a non-existent speed dialing list will cause the system to crash! The addresses of DB_S_AM_CSD_TRANSL_TBL are different in the OpenScape 4000/HiPath 4000 variants. Using a wrong address may cause the system to crash!

10.51.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
SBCSU/ SCSU/ SSCSU	RNGI	d	rufnummerngeber individuell (0, 10 ,20 ,30)
	SPDI	e	station with speed calling individual (0, 10 ,20 ,30)
TAPRO	SYSSP1	d	kurzwahl zentral 1
	SYSSP1	e	system speed key # 1
	SYSSP2	d	kurzwahl zentral 2
	SYSSP2	e	system speed key # 2
	SPDI	d	kurzwahl individuell
	SPDI	e	speed dial (station speed) key
ZAND	RNGZTYP	d	5ZIFF= Kundenindiv.RNGZ mit Umwandlungstabelle
	CSDTYPE	e	5DIG= Customer individual CSD with translation table

10.52 Stations

Use the following AMOs to enter data for stations:

AMO SCSU

- Add ports for ANATEs, ANATECM, as well as, ANATE/FAX, ANATE/ DTEANA.
- Add the auxiliary Digite AUXDIGI for "Trading Classic" and "ViNet" (DIGI260 was used for this before OpenScape 4000 was released)
- You can add users without terminals, known as **dummy** users/stations or ID-card users. These are configured in the same way as normal terminals

connected to a line module but are not assigned a PEN. The SCSU parameter INS=FLOAT must be set for these users. ID-card users can telephone from any station that has a card reader, using the class-of-service and the station number assigned to the ID card.

- The ACL support station is a special type of **dummy** station (INS=ACLSTN) that is configured in the system like an ID-card user. If this ACL support station is configured as a Digite (AUXDIGI), it goes into operation as soon as it is added (DC state 'Ready'), even if there is no terminal connected. These support stations are often also referred to as 'phantoms' (particularly in the U.S.). A 'phantom' can only be deleted if is not processing any calls.

  When the data is interrogated, group assignments are also displayed, such as, hunt groups, call pickup groups and night switch systems in which the terminal is incorporated.

  A terminal is normally put into operation immediately when the data is added. This is done by setting the parameter INS=NO.

  Device configuration data cannot be changed with the AMO SCSU (parameter DEVCFIG). In order to change configuration data, you must delete the old configuration and add a complete, new configuration. The circuit can be disabled beforehand and enabled again afterwards with the AMO DSSU. You can also use the AMO SCSU's delete command to disable circuits (OFFTYPE=DC=default value, that is, with camp-on (soft lock) or OFFTYPE=DI, without camp-on (hard lock)).

  You can also add station data in "signed off" status (ANATE only). To do this, you must specify the SCSU parameter INS=SIGNOFF and assign no PEN (the PEN parameter is otherwise ignored), see "Autoset Relocate Applications" chapter.

  Stations for users who do not wish their number to be displayed at a called DIGITE must be configured with the parameter SSTNO (secret station number). Two versions of call number suppression can also be set specifically for external calls: The parameter SSTNO=ONLYEXT suppresses external call number display and replaces the call number with a substitute number set with the AMO KNMAT. The parameter SSTNO=ONLYEX0 suppresses external call number display. For more information, see the "Display Suppression" chapter.

AMO SBCSU

- Assign terminals for the S0 bus, S0/S2 interface or the UP0/E interface. You can configure set 600 terminals (Euro ISDN) at the functional bus for VOICE. For non-voice devices, you can configure the devices for DTE, FAX and S0/S2 connections to DP, LAN and servers. For more information, see the "Digital Stations with S0 Interface" chapter.
- Add OPTIIP terminals (IP phones) on the STMI-HFA boards. These are configured with CONN=IP on the STMI-HFA board and with CONN=IP2 on the STMI2-HFA board.

AMO SSCSU

- Special configurations, such as "Trading" devices and telecommuting server connections and extension connections can be configured with the AMO SSCSU, see the relevant chapter.

AMOs for configuring additional station data

- AMO TAPRO

  For each device type key layout standards are stored in the database. The key standard allocated to the device (SBCSU/ SSCSU, parameter STD) can be changed with the AMO TAPRO. Individual key layout standards can also be created.
- AMO TGER

  Each voice terminal can be assigned one NON-VOICE device per service (FAX, DTE) in the incoming direction.
- AMO PERSI

  Allocation of names, organizational units and personal identification number for card reader (PINC), personal identification - manual (PIN1 to PIN15) and class of service changeover code (COSXCD) for a station number. Several PINs and several names may be assigned to one station. Service identifiers (SI) can be configured independently of call numbers. For further information, please refer to the section "Personal Identification Numbers".
- AMO ZIEL

  Assignment of a call forwarding destination, name keys and DSS keys as well as redial destinations to a station number.
- AMO SDAT

  You can administer station-specific attributes and features for the voice service. General, device-independent data can also be administered.

10.52.1 Adding a Station (Example)

- Add a station number as follows:
  `ADD-WABE:CD=<key-num>,DAR=STN;`
- Add a class of service as follows:
  `ADD-COSSU:AVCE=<param>;`
- Add a station as follows:

  – ANATE, AUXDIGI with the AMO SCSU:

  ADD-
  SCSU:STNO=<number>,DVCFIG=<param>,COS1=<number>,COS2...,LCOSV1=...,L

  – Add a station at the UP0E port as follows:

  ADD-
  SBCSU:STNO=<number>,OPT=OPTI,DVCFIG=<param>,COS1=<number>,
  COS2=<number>,LCOSV1=...,LCOSV2=...,LCOSD1=...,LCOSD2=...;

  – The AMO SSCSU is used for adding special stations

  (see AMO description or special applications).

  You can select a key layout standard with the parameter STD when adding a station with the AMO SBCSU/SSCSU (key layout). You can modify this key layout later with the AMO TAPRO. You can modify the key layout separately for each individual station.
- Change the key layout for a special station:
  `CHA-TAPRO:STNO=number,[KY01=param]...[KY19];`

- Each station number can be assigned a name, PIN and organization name, for example, with:
  ADD-
  PERSI:TYPE=STN,STNO=<number>,NAME=<string>,ORG=<string>,
  PIN1=<number>;

10.52.2 Displaying Station Class of Services

- Display station classes of service (class-of-service numbers for COS1 and COS2) with:
  DIS-SCSU:STNO=<number>;

  or
  DIS-SBCSU:STNO=<number>;

  or
  DIS-SSCSU:STNO=<number>;

  The classes of service for COS1 and COS2 can then be found in the output.
- You can also use the AMO SDAT to display the class of service for random stations, regardless of the AMO used to configure the station.
  DIS-SDAT:STNO=<number>;
- You can display the classes of service (which privileges are configured, for example, in the classes of service) with:
  DIS-COSSU:TYPE=COS,COS=<cos_from_display>;

10.52.3 Displaying a Station from a Specific Class of Service

When displaying the COS with the AMO SBCSU, you also see the stations that were assigned this COS with the AMO SCSU. However, the DISPLAY-SCSU command will only display stations with the specified COS which were actually configured with this AMO. Use the AMO COSSU to display all stations (including SSCSU stations) and trunks with a specific class of service.

(Example)

DIS-SCSU:TYPE=COS,COSNO=<number>;

or
DIS-SBCSU:TYPE=SEARCH,COSNO=<number>;

or
DIS-COSSU:TYPE=COS,COS=<number>,FORMAT=REF;

10.52.4 Displaying Station Features

Display station data:
DIS-SCSU:STNO=<number>;

or
DIS-SBCSU:STNO=<number>;

or
DIS-SSCSU:STNO=<number>;

The output table shows the active features under the heading "Activation Identifiers for Features".

10.52.5 Changing a Station's COS

- Display a station's COS (1st and/or 2nd COS), and subsequently display all stations with the same COS.
  `DIS-SCSU:STNO=number;`

  or
  `DIS-SBCSU:STNO=number;`

  or
  `DIS-SSCSU:STNO=number;`

  or
  `DIS-COSSU:TYPE=COS,COS=number,FORMAT=REF;`
- Station is the only one with this COS -> change COS:
  `CHA-COSSU:TYPE=COS,COS=number,AVCE=param;`
- Several stations have this COS -> station receives new COS:
  `ADD-COSSU:COPYCOS=number,AVCE=param;`
- Assign the new COS to the station:
  `CHA-SCSU:STNO=number,COS1=number,COS2=number;`

  or
  `CHA-SBCSU:STNO=number,COS1=number,COS2=number;`

  or
  `CHA-SSCSU:STNO=number,COS1=number,COS2=number;`

10.52.6 Station Number Changes

10.52.6.1 Feature Description

Once a station has been configured in the system, you can change its call number without first deleting and reentering it.

10.52.6.2 Service Information

- The number under the parameter NEWNO must be applies locally to the STN DAR in the AMO WABE and must be predefined (free).
- The original number is redefined in the AMO WABE after the call number has been changed.

10.52.6.3 Generation (Example)

Change the station number:
`CHA-SCSU:STNO=<number>,NEWNO=<number>;`

or
CHA-SBCSU:STNO=<number>,NEWNO=<number>;

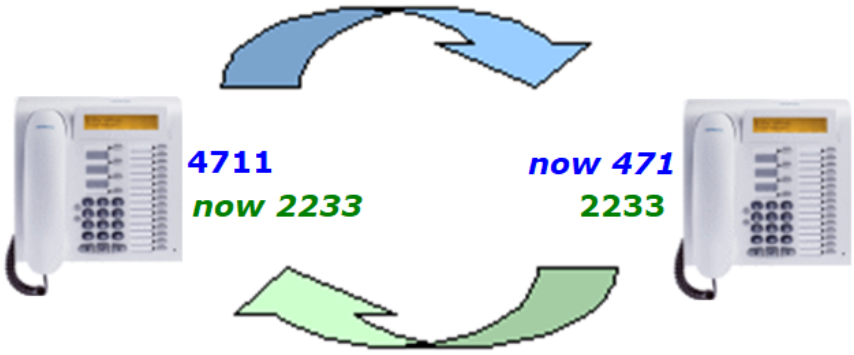
or
CHA-SSCSU:STNO=<number>,NEWNO=<number>;

or
CHA-SDAT:STNO=<number>,TYPE=DATA,NEWNO=<number>;

10.52.7 Swapping Station Numbers

10.52.7.1 Feature Description

Station numbers of voice terminal configurations (=telephones) can be swapped with the aid of the AMO SXSU. The parameter STNOX defines the station number which is to be exchanged for the station number defined by the parameter STNO.



10.52.7.2 Service Information

- Both devices must be supported by the AMO SXSU.
  - The station must not be an AGENT, SUPER, CAF or AUTOLOG.
  - The station must not be a TEAMSECR or TEAMEXEC, either.
- This DSS destination is deleted at all stations where the STN to be modified is set as a DSS destination.
- No jumpering changes are necessary.

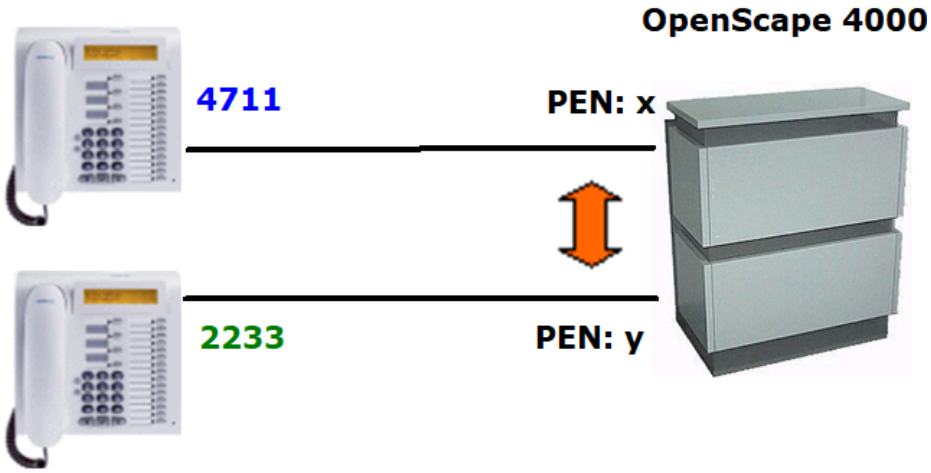
10.52.7.3 Generation (Example)

Exchange station numbers:
CHA-SXSU:STNO=<number_a>,TYPE=STNO,STNOX=<number_b>;

10.52.8 Changing the Station Port Assignment

10.52.8.1 Feature Description

ANATEs and an S0 bus or optiset E/optiPoint 500 telephone can be assigned to a different port with the AMO SXSU (feature and group assignments are not lost). All other terminal types, such as, individual devices on the S0 bus or optiset E port must be deleted and then re-assigned (see also following section).



10.52.8.2 Service Information

IMPORTANT: The PEN can only be modified with the AMO SXSU within a physical node.

- After changing the port equipment number assignment, replug the station line on the MDF.

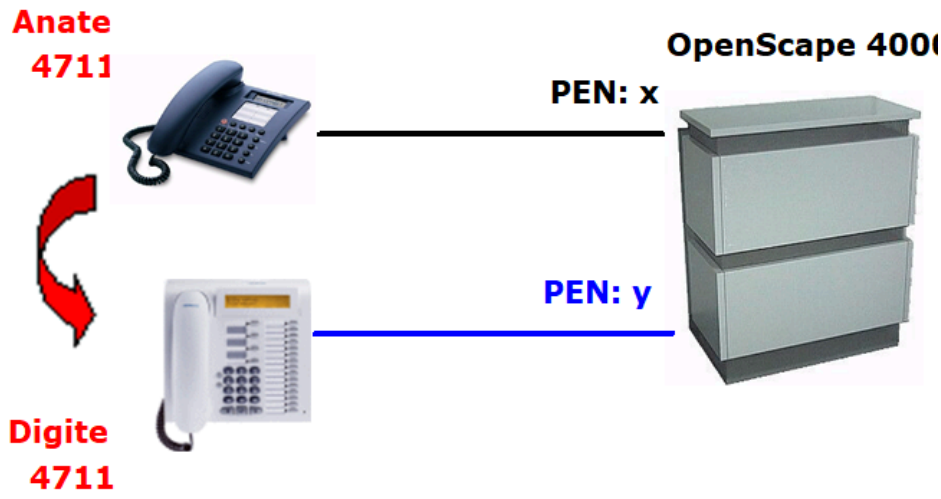
10.52.8.3 Generation (Example)

Change the port equipment number:
`CHA-SXSU:STNO=<number>,TYPE=PEN,PEN=<ltg-ltu-slot-port>;`

10.52.9 Exchanging Terminals

10.52.9.1 Feature Description

You can use AMO SXSU to replace ANATE voice terminals with optiset E or optiPoint 500. (Not applicable to: dummy terminals and SET600.)



10.52.9.2 Service Information

- You must connect the new device type to the new PEN following changes to the configuration.

  IMPORTANT: A device changeover from optiset E to optiPoint 500 is not supported by AMO SXSU because this changeover is automatically detected by the system.

- All other terminal types must be deleted and then re-assigned!

  IMPORTANT: Existing group assignments are not lost.

10.52.9.3 Generation (Example)

- Exchange a voice terminal:
  ```
  CHA-
  SXSU:STNO=number,TYPE=DEV,OPT=param,DVCFIG=param,...;
  ```
  All terminals that are not supported by the AMO SXSU can be modified by deleting the old device and configuring a new port with the appropriate data. In these cases, if the parameters and features of the old device configuration are to be taken over, you must display and/or save the appropriate data before you delete the configuration data, so that you can re-assign them to the new device configuration as required.
- Display station data:
  ```
  DIS-SCSU:STNO=number;  or

  DIS-SBCSU:STNO=number;
  ```

- Save device configuration data and features with REGENERATE commands.
  ```
  REG-SCSU:STNO=number;
  ```
  or
  ```
  REG-SBCSU:STNO=number;
  ```
  or
  ```
  REG-SSCSU:STNO=number;

  REG-AUN:TYPE=STN,STNO=number;

  REG-SA:CD=number;

  REG-NAVAR;

  REG-SDAT:STNO=number;

  REG-COMGR:TYPE=STN,STNO=number;

  REG-PERSI:TYPE=STN,STNO=number;

  REG-ZIEL:TYPE=FWD,SRCNO=number;

  REG-ZIEL:TYPE=NAME,SRCNO=number;

  REG-ZIEL:TYPE=SPDI,SRCNO=number;

  REG-ZIEL:TYPE=SNR,SRCNO=number;

  REG-TGER:STNO=number;
  ```
  Additionally, for messenger, DSS and executive/secretary destinations:
  ```
  REG-ZIEL:TYPE=MSGR,SRCNO=number;

  REG-ZIEL:TYPE=DSS,SRCNO=number;

  REG-CHESE:TYPE=STN,STNO=number;
  ```
- Delete the device configuration data:
  ```
  DEL-SCSU:STNO=number,CMIND=ALL,OFFTYPE=DI;
  ```
  or
  ```
  DEL-SBCSU:STNO=number,SVC=ALL,OFFTYPE=DI;
  ```
  or
  ```
  DEL-SSCSU:STNO=number,OFFTYPE=DI;
  ```
- Re-assign station (see Section 142.1, "Adding a Station (Example)")

  In the ADD command which results from the REG-SCSU/SBCSU/SSCSU command, you must change the parameter DVCFIG to the new terminal type and, where applicable, replace the AMO names and adapt the parameter tree (for example, if you want to replace an ANATE for an optiset E). Re-assign station data and features with the remaining ADD commands.

10.52.10 Station Port Deletion

- Display station data:
  `DIS-SCSU:STNO=number;`

  or
  `DIS-SBCSU:STNO=number;`

  or
  `DIS-SSCSU:STNO=number;`

  The display table shows which groups the station belongs to.
- Deactivate port:
  `DEACTIVATE-DSSU:OFFTYPE=DI,TYPE=STNO,STNO=number;`

  Station is a member of one or more hunt group(s) (HT):
  `DIS-SA:STNO=number;`
- Station is a master of a hunt group; enter another station as master:
  `CHA-SA:TYPE=SA,CDOLD=number,CDNEW=number;`
- Station user is an owner of a mailbox which is assigned as overflow for a hunt group. Enter another station as mailbox owner:
  `CHA-SA:TYPE=OVFLDEST,OVFLDEST=VMSINT,NUMBER=number;`
- Remove the station from the hunt group(s).

  The command must be repeated for each hunt group displayed!
  `DEL-SA:TYPE=STN,CD=number,SVC=param,STNO=number;`
- Station is a member of a night option. Display night options:
  `DIS-NAVAR;`
- Remove the station from the night option or delete the night option, if the station is the only one assigned.
  `CHA-NAVAR:FUNCT=DIS,TYPE=STN,STNO=number;`

  or
  `DEL-NAVAR:NOPTNO=number;`
- Station is a member of a pickup (PU) group:
  `DEL-AUN:TYPE=STN,STNO=number;`
- Station is an executive in an executive-secretary (CHESE) group:
  `DEL-CHESE:TYPE=GR,GRNO=number,EXEC=number;`

  If the station is a secretary, the corresponding executive station must also be entered.
- Delete the station with:
  `DEL-SCSU:STNO=number,CMIND=ALL,[OFFTYPE=DI];`

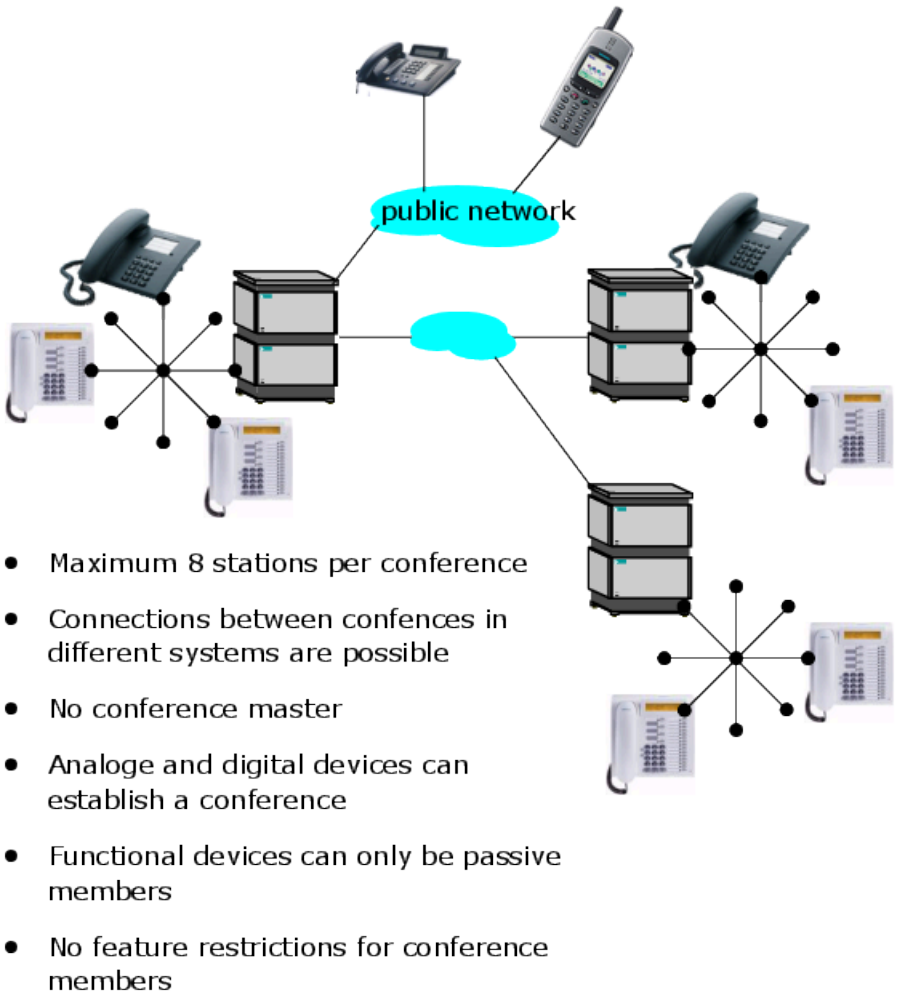
  or
  `DEL-SBCSU:STNO=number,BERLM=ALL,[OFFTYPE=DI];`

  or
  `DEL-SSCSU:STNO=number,[OFFTYPE=DI];`

10.53 Station Controlled Conference

For OpenScape 4000 there will continue to be "Three-way conference" created by functional devices only. The new **Station Controlled Conference** applies for all other devices.

"Eight Party Conference", which has the conference "master" (also known as the conference chairperson) does not exist in OpenScape 4000.



10.53.1 Feature Description

Station Controlled Conference (3-8 party) provides the capability for a non-functional device (e.g., analog or digital) to create a three to eight party conference. All parties within the conference (except functional devices) have the capability to consult out of the conference and bring parties into the conference as long as the maximum number of parties in the conference does not exceed eight parties. Functional devices are considered passive parties in a station controlled conference and therefore can not consult or initiate features or functions.

Overview:

- Allow a conference of 3-8 parties to be established from analog and digital devices (except functional devices).
- In a Station Controlled Conference, functional devices as conference members are passive and therefore do not have access to features and functions.
- Allow one or more users within a conference to consult to a party outside the conference.

- Allow one or more users within a conference to toggle between a party outside the conference and the conference.
- Allow one or more users within a conference to consult to a party outside the conference and bring that party into conference.
- Allow one or more users within a conference to view the conference members.
- Allow independent conferences to be created when one or more of the conference parties are located across a CorNet network. A party located in a remote node from the conference can also create a conference within their node. From the user point of view, the connection between nodes shall be treated like two independent conferences.
- One or more members shall be allowed to initiate the above mentioned functions simultaneously.

10.53.1.1 Hold a Conference

An analog telephone user can use the consultation hold feature to place a conference on hold. They can not use the Group Park (hard hold) or Call Hold feature to place a conference on hold.

A Keyset user can use the Manual/exclusive Hold feature or the consultation hold feature to place the conference on hard hold or soft hold.

A Digital Feature Telephone (DFT) can use the consultation hold feature to place a conference on hold (soft hold). They can not use the Group Park (hard hold) feature to place a conference on hold.

Executive/Secretary (CHeSe) telephone arrangements can use the features associated with the physical device and configuration the user is active on.

A functional device (e.g., Profiset) is a passive conference member and therefore can not activate features and functions while in a conference.

10.53.1.2 Pick a Call and add to Conference, or Create a Conference

Allows one or more users within a conference to simultaneously initiate

- directed call pick up
- group call pick up
- pickup of a camped-on call

and add the call to conference.

Allow a user while active in a basic call connection to pickup a call (e.g., camped on call, directed call pickup, group call pickup) and create a conference.

10.53.1.3 Station Controlled Conference in the Private Network

It is possible to create large conferences in the network by adding a remote party located in another node, and then that party create a conference in their own node. There is no restriction in the total number of conference participants in a network wide conference other than the availability of the conference

resources themselves and the local restriction of eight parties per conference circuit.

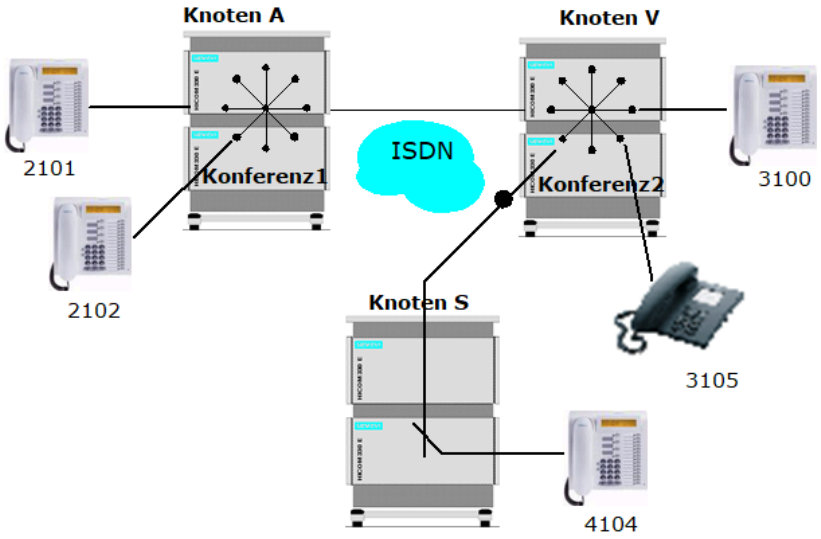


Figure 113: Conference using two conference modules

A remote conference member without its own conference (station 4104 in the above diagram) located in another PINX(Private Integrated Network Exchange)has some limitations including

- Not being allowed to delete conference members,
- Local member can consult with a remote member but not with other local members whereas remote members are not restricted,
- Not receiving notification of members added/leaving/holding the conference, and
- Not being able to scroll through the conference member list.

When a station is a remote conference member i.e without it's own conference, signalling of supplementary services shall occur to the conference (e.g., user suspended).

Whereas, when a chained conference exists (i.e., two or more conference circuits connected together as is Conference 1 and Conference 2 in the figure above), signalling of supplementary services which the remote members invoke shall not be signalled to the remote conference.

Backward compatibility to the US and IM installed bases is provided.

10.53.1.4 Prevention of consultation, transfering and hold by networked conference party

Switch A has a Conference and Switch B has Station 1. A member of the Conference adds Station 1. If station 1 goes into consultation the Conference then does not listen to Music On Hold or Ringback because Station 1 has placed the Conference on Hold. The conference continues as normal, stattion 1 can then bring in the consulted party into a conference on its local switch which is chained to the original conference

See Section 143.5, "Relevant AMOs" for information about the AMO-COT parameter NOHO and interaction with switches which do not signal hold.

10.53.1.5 Starting a Conference using Keyset Lines

With this function you can create and enhance a conference if a keyset device holds an other device in linehold. This feature can be used only for keysystem device.

Service Information

- The conference master has to have the right (AMO COSSU) to create or to enhance a conference.
- Conference master have to hold a device (anate, digite, trunks, ISDN devices) in linehold.

  If there is more than one device in linehold by conference master keyset, then the device found at first will be joined to the conference.
- The conference master has to be in basic talk connection.
- The active connection of the joined device has to be the linehold connection: if the joined device makes consultation then creating or enhancing conference is not possible.

Restrictions

- If a keyset is in a conference and it is possible to enhance the conference by this way the **VIEW MEMBERS** conference menu item is missing.
- To create or enhance the conference is only possible using conference key or ACL conference service.

Generation

- A new parameter was introduced in AMO COSSU for creating or enhancing conference: **CFKL**.
  `e.g.: CHANGE-COSSU:TYPE=COS,COS=23,AVCE=CFKL;`
- Physical station A with secondary line B and C

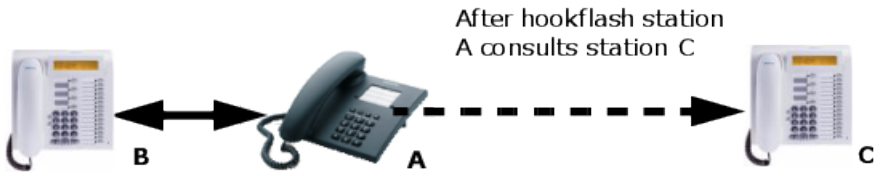
  Station A presses line key for station B and calls D --> D answers, Station A presses line key for station C and calls E --> E answers.

  In order to work the conference properly station C also needs to have a secondary line for station B.
  `CHANGE-KCSU:STNO=<C>,TYPE=SEC,KYNO=<Linekey number>,STNOSEC=<B>;`

10.53.2 User Interface

10.53.2.1 Create and add

AnaTe

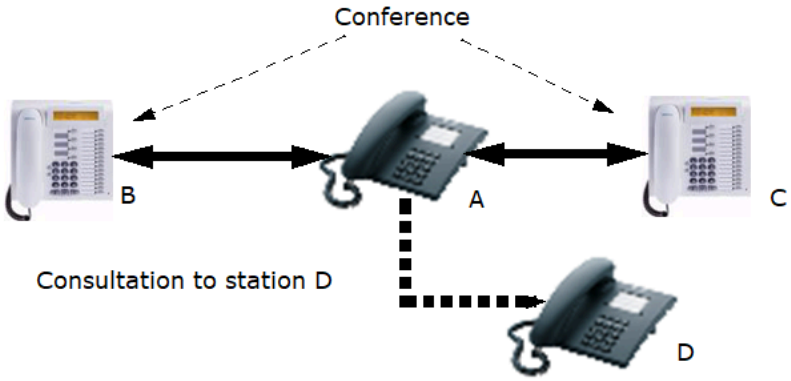


- Party A is in conversation with Party B

  IMPORTANT: Operation is different from the U.S V6.6. User must dial access code to bring party into conference. V6.6 uses hookflash to bring party into conference.

  Stn A is in talk state to Stn B. A initiates consultation hold and dial the code for stn C . When C answers A initiates again consultation hold and dials the conference access code. All partys hear conference tone and the conference is established

- PartyA is in a conference with Party B and Party C (prior to dialing party D)



  Stns A,B and C are in conference. Stn A initiates consultation and dials stn D . At this point although the conference is on "hold" no MOH is heard and the conference carries on as normal i.e. B and C are in conference. Stn A can bring Stn D into the conference.

DigiTe or DFT

The conference feature with digital telephones is similar to the Anate in function but is made easier due to the extra functionality with these sets. Access to a conference is via CONF key, or the Conference switch from the Optiguide menu reached by pressing > after consulting with a party. Also with digital telephone sets there is the possibility for a display function

With Station controlled conference the display is different from previous versions.

Note: Pressing the "<" or ">" shall remove display line 2 and display the Optiguide Feature Prompt (dialog). The position number does not stay in

It is also possible to view members of the conference.

Note: Pressing the "<" or ">" shall remove display line 2 and display the Optiguide Feature Prompt (dialog). Pressing the tick presents the next member of the conference
Network conference members can see members of their own conference and the "partner" station i.e. the member they invited ,or were invited by, into the conference, but not the conference members in a foreign node.

10.53.2.2 Hold of a Conference

- A member can place the conference on consultation hold by consulting to a station outside the conference in the usual way.
- A member (DigiTe only) can place the conference on background hold by performing any type of pickup.
- A member (DigiTe only) can place the conference on manual or exclusive hold by performing manual or exclusive hold in the usual way.

In both cases the conference does not hear any hold tone and is in effect still functional.

10.53.2.3 Pick a Call and Create a Conference

Any station who is in conference can:

- pick-up a waiting call by pickup group or direct call pick-up.

The picking party leaves the conference functioning as before.

10.53.2.4 Pick a Call and add to the Conference

Upon picking up a call:

The conferee can press

- the CONFERENCE key, or
- CONSULT key plus access Code for conference

to add the caller to the conference.

10.53.2.5 Removal of a Conference Member

AnaTe

- Hookflash followed by access Codes for release of each party (1-8) or release last party. There are separate access codes to be added in the dial plan to allow these functoions

DigiTe

- Access Codes for release of each party (1-8) or release last party during consultation out of conference
- CLEAR or CANCEL key to remove last party (only if conference member is not being viewed)
- Upon viewing a conference member (while display is active) press CLEAR OR CANCEL key to remove that party
- Deactivation via Optiguide Feature Prompts (dialog).

10.53.2.6 Optiguide

Viewing Conference Members

To view conference members, while active in conference:

The user displays are the same for all methods of viewing conference members (uses Optiguide sub-menus)

- Press CONF key (multiple times) to scroll through conference members (note: positions not occupied shall be skipped)

  or
- Optiguide Feature Prompts (dialog) "<View members? >"

IMPORTANT: Pressing the associated keypad digit to view a conference member is not possible.

Other Optiguide Information

The following feature prompts shall be displayed on line 2 when the user is active in a station controlled conference with no held party (e.g., toggled party).

"Consultation? >"

"Add to conference? >"

"View members? >"

"Release last party? >" (if applicable)

10.53.2.7 Station Controlled Conference in the Private Network

When the local and remote nodes have a linked conference connection established:

- The user interface can operate as two independent conferences. Therefore, members in each independent conference can be able to scroll through their respective conference members (local to their node) and see the party they are linked to in the remote switch

When a conference is established in one node with a "single station" across CorNet:

- From the "single station's" point of view the following happens:
  - The CONFERENCE key LED of the single station doesn't light unless a local conference is established in the single station node, which includes that station.
  - When brought into the remote conference the single station gets a display "CONFERENCE" as indication that they are connected to a remote conference.
  - The single party station node shall not inject music into the remote conference when placing the remote conference on soft or hard hold. See AMO-COT information in Section 143.5, "Relevant AMOs" for additional information in situations where the single party's node does not signal hold.
  - The single station shall be able to initiate all local features they could initiate **when active in a two party connection in their node**, with some exceptions:

The single station cannot do transfer by pull when consulted across the NW by a conference member
The single station cannot do transfer ringing or transfer busy when consulting away from the conference connection.
The single station cannot park the conference connection, since pickup of a conference connection is not allowed.

- From the remote conference point of view the following shall happen:
  - The remote conference members shall have access to all conference features local to their node.
  - The remote conference members display shall display the single station's name and private number information.
  - The remote conference members' display shall not be updated if the single station creates a conference or is brought into a conference local to the single party node.
  - The remote conference members display shall be updated if the CorNet link between the single station and remote conference is disconnected or if the conference established at the single station node is disconnected.

10.53.3 Service Information

There are no patches or country specific implementations.

- Paying-Party for Conference Calls

  There is no conference master for the station controlled conference of OpenScape 4000 the Paying-Party for each part call of the conference will be the corresponding conference convener. The convener will remain as Paying-Party for his branch also when he has left the conference already.

- Charge Display for Station controlled Conference

  A Charge Display will be sent to the convener only when he drops out of the conference. A convener will get no further Charge Displays after he has left the conference, even though he may continue to be the paying party for some remaining conference legs.

  Because of the fact that for each part call of the conference the corresponding convener will be the Paying-Party INCDR can not summarize all the costs of all COSTI buffers administrated in one COSTI buffer administration table and send the resulting cost amount to the display of the conference master.

  For station controlled conference INCDR must identify all COSTI buffers with the same Paying-Party summarize the costs and send the resulting cost amount to the display of the responsible conference convener.

10.53.4 Generation

- Activate variable conference in the system:

	The activation of VARKONF is only possible in expert mode. Expert Mode > OpenScape 4000 > Expert Access > Open ...<IP> with AMO (see AMO command)
	`CHANGE-FEASU:TYPE=A,CM=VARKONF;`

- ADD DAR for conference:

	Configuration Management --> Tables --> Dial PLan --> Dial Codes, Click New. Enter Dial Code and select CONF as Code Type. Click Save.
	`ADD-WABE:CCD=91,DAR=CONF;`

- Change display time of conference information (if wanted):

	The time how long the conference information is displayed on a digital phone can be performed in expert mode. Expert Mode > OpenScape 4000 > Expert Access > Open ...<IP> with AMO (see AMO command)
	`CHANGE-DTIM1:TYPEDH=DIGITE,VWKONFMB=<sec>;`

10.53.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COSSU	CFKL	e	Conference from keyset lines
	KVKL	d	Konferenz von Keyset-Lines
FEASU	CM	e	The value VARCONF allows Station Controlled Conference in the system
	LM	d	Über den Wert VARKONF können Teilnehmergesteuerte Konferenzen in der Anlage zugelassen werden
DTIM1	VWKONFMB	e	This timer shall control the length of time the conference information is displayed at the digital telephone
	VWKONFMB	d	Dieser Timer bestimmt, wie lange die Konferenzinformationen an digitalen Telefonen angezeigt werden
WABE	DAR	e	The following values are relevant for conference: CONF CONFKY RMCONFP1 RMCONFP2 RMCONFP3 RMCONFP4 RMCONFP5 RMCONFP6 RMCONFP7 RMCONFP8 RMCONFLP

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	KZP	d	Folgende Werte sind für die Konferenz relevant: CONF KONFTA RMCONFP1 RMCONFP2 RMCONFP3 RMCONFP4 RMCONFP5 RMCONFP6 RMCONFP7 RMCONFP8 RMCONFLP
COT	NOHO	e	Prevention of consultation, transfering and hold by networked conference party This is to be set when connecting to a system of HV1.0 or earlier. These systems do not send the facility messages for conference hold in the same way a OpenScape 4000 system does. Because of this there is the danger the conference would be forced to listen to hold tone which is not desired. Setting this parameter prevents a station in the remote node from going into consultation. This means however the remote station can not inintiate a local conference of its own.
	NOHO	d	Rückfrage, Übergabe und Halten durch vernetzten Konferenzteilnehmer verhindern. Diese Anlagen senden die Dienstmerkmal-Nachricht für "Konferenz Halten" anders als die OpenScape 4000-Anlage. Deshalb besteht die Gefahr, dass die Konferenz den unerwünschten Halteton hört. Dieser Parameter verhindert, dass eine Endstelle im abgesetzten Knoten in Rückfrage geht. Dies bedeutet allerdings, dass diese Endstelle nicht in der Lage ist, eine eigene lokale Konferenz einzuleiten.

10.54 Station Relocation

10.54.1 Feature Description

The station relocates from one physical network node to another and retains its call number. First, regenerate and delete the station configuration data in the old node (with AMO SCSU or SBCSU) and enter the destination number of the new node in the AMO WABE. Then re-configure the station configuration data in the new node (using the regenerated data) after the DESTNO has been set to "0" in the AMO WABE. The destination number of the new node must be entered in the AMO WABE for all other nodes in the network (with closed numbering).

10.54.2 Service Information

- A station can also be relocated within a physical node using the AMO SXSU (PEN exchange).
- Use the AMO SDAT parameter NNO to relocate a station within a physical node from one virtual node to another (no PEN exchange).
- If the station is a member of a call pickup group, executive/secretary system, night switch system, ACD group, COM group, keyset or hunt group, it must first be removed before it can be relocated to another physical node.
- Before deletion, all relevant station data must be regenerated (AMOs SDAT, ZIEL, ACTDA, PERSI, TAPRO, LIN, HOTLN, etc.) so that it can be reentered in the destination system.

10.54.3 Generation (Example)

Station 7140 moves from node 1-89-100 to node 1-89-300. (Prerequisites: network with closed numbering, standard classes of service and key layouts, LCR configured and no deviating settings in the AMOs SDAT, ZIEL, ACTDA, PERSI, TAPRO, LIN, HOTLN, etc.)

- Commands for node 1-89-100 (part 1)
  `REGEN-SBCSU:STNO=7140;`

  (regenerate further station data if necessary)
- Commands for node 1-89-300

  Change the station from external to internal with:
  `CHA-WABE:CD=7140,DESTNO=0;`

  Re-configure the station in node 1-89-300 with (the REGEN command from node 1-89-100), for example:

  ```
  ADD-SBCSU:STNO=number,OPT=OPTI,DVCFIG=param,
  COS1=number,COS2=number,LCOSS1=number,
  LCOSS2=number,LCOSD1=number,LCOSD2=number;
  ```

- Commands for node 1-89-100 (part 2)

  Delete the station with:
  `DEL-SBCSU:STNO=7140,SVC=ALL;`

  Assign the destination number for node 3 with:
  `CHA-WABE:CD=7140,DESTNO=3;`
- Commands for all other nodes in the network
  `CHA-WABE:CD=7140,DESTNO=3;`

10.54.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
SBCSU		d	alle
		e	all
WABE	RNR	d	Rufnummer
	CD	e	access code / station number
	ZLNR	d	Zielnummer
	DESTNO	e	destination number

10.55 Step by Step Dialing

10.55.1 Description

Step by step (cut-through) dialing means that when the transition to the next node has been reached, the subscriber hears an announcement, dials more digits, hears another announcement, dials again etc., until the required destination has been reached. The subscriber can only hear the announcement/ tones if these have been configured. Dialing must be carried out via dialed digits only and not via touchstone dialing. The dialing procedure described is possible when dialing into a OpenScape 4000 system via an ISDN connection and in the case of transit traffic to a step by step dialing connection. The ISDN B-channel (audio path) is not activated in the current call situation, meaning that the subscriber cannot hear the announcements. With step by step dialing, this B-channel through-connection becomes effective without any change of status.

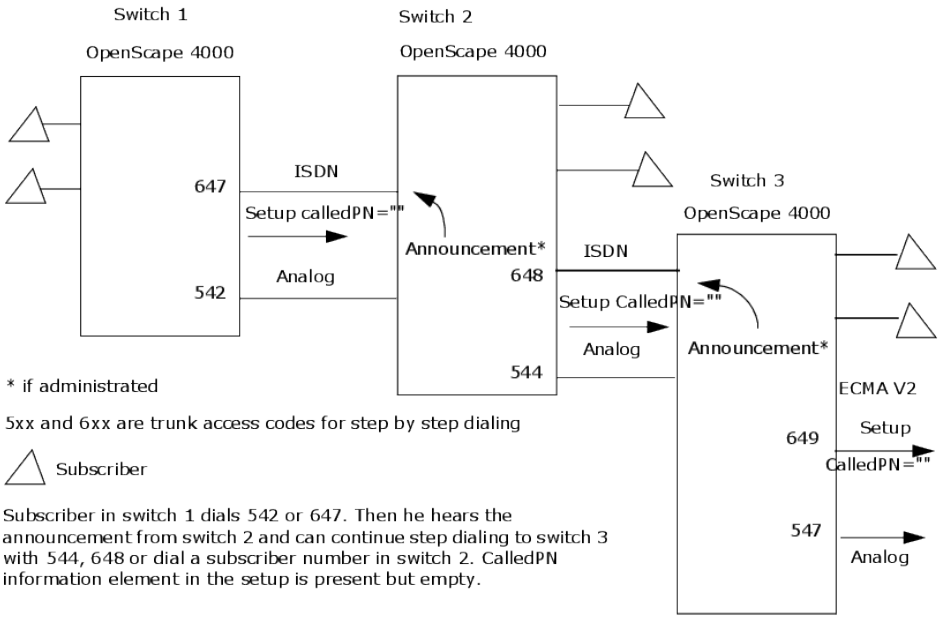


Figure 114: Step by step dialing

10.55.2 Supported Hardware, Lines, Protocols

Step by step dialing operates via CAS, E&M with DP and DTMF, and with the ISDN protocols DSS1, ECMA and CorNet.

10.55.3 Restrictions

- In the case of MFC lines, no provision is made for step by step dialing. The system can be configured to prevent transit DID traffic from MFC lines from occuring on a step by step dialing route.
- A maximum of 22 digits can be transmitted.
- ANATE with DTMF is not supported
- Step by step dialing from functional S0 terminals is not supported.
- Step by step dialing is only possible for the Voice service.
- Step by step dialing is only supported by special ISDN exchanges due to premature B-channel through-connections. The LM44573 must be active in the EWSD exchange.
- The ECMA protocol cannot transfer any SETUP without Called Party Number (see Section 145.4.3, "Outdial Rule").
- Step by step dialing is not applicable for the US market.

10.55.4 Basic Configuration Notes

10.55.4.1 No Answer

- If one of the circuits used in the step by step dialing connection is capable of transmitting a NO answer signal, only dial pulsing or ISDN circuits are permitted for the entire step by step dialing link (problem of digit repetition in DTMF circuits). This is only necessary if a DTMF circuit is available in the link that is not capable of transmitting an ANSWER signal.
- In the digit range, the digit "# "cannot be used as the access code, since this digit is required for speedy through-connection once the last digit has been dialed (through-connection of the call only after step by step dialing timeout is thereby no longer valid -> immediate through-connection of the call). Once "#" has been dialed, it is not possible to dial further digits.

10.55.4.2 Routing

In the AMO RICHT (for the outgoing analog step by step circuit), both REROUTING and ROUTOPTIMATION must be set to NO.

10.55.4.3 Outdial Rule

- Dialing must lead to the digit analysis result CTDL.
- The AMO LODR can only contain the value "END".
- If an ECMAV2 link starts with a step by step dialing digit analysis result, then parameter "OUTPULSE" must be configured before the "END" in the AMO LODR and it must be assigned the value of the node number of the next allocated node (exception: where the ECMAV2 protocol has been altered using a customer-specific patch and PRODE commands so that the parameter "OUTPULSE" is not needed).

10.55.4.4 COT/COP

- If a local announcement is to be supplied from an incoming allocated circuit, the COT parameter "ANNC" is to be set. The SIU tone is then applied. This tone was configured by assigning the value LOCANN in the AMO ZAND:TONES (incoming allocated circuit). With the COP DTN, the analog trunk sends a tone to the remote office. You can configure which tone is sent with the COT parameter (NTON, ONAS, DTNI, DTNE)
- For analog trunk line circuits reserved for reverse dialing in incoming traffic, the COT parameter "USD" must be set for unrestricted suffix-dialing. This is not necessary for outgoing step by step dialing in tie trunk traffic.
- For further dialing after ANSWER, the COP parameter "SEDL" must be set

10.55.4.5 Timer

- The timers in the ECMA, DSS1 and CorNet circuits must be set to "0" (T302, T303, T304)
- If no "ANSWER" is transmitted, the audio path of the step by step dialing connection becomes active only after the timer has run out (DTIM2->TYPEDH=GEN-> CTDL). If the timer had not run out, the subscriber can

dial further digits for step by step dialing. The audio path has already been connected but the speech path has not.

10.55.5 Configuration Examples

10.55.5.1 ECMA Protocol with Announcement

```
CHA-FUNCT:SLANG=GER;

/* Back to english with: CHA-FUNCT:SLANG=ENG; */
/* announcement for call by call dialing, not
 CALLED_NUMBER
ECMAV2,DSS1 */
/* Change setting for called Num IE from MAND to OPT */
/* PVCD table 1 Germany, PD14 = ECMAV2               */

DEACTIVATE-DSSU:DI,PEN,x;

CHANGE-TDCSU:DEV=S2CONN,BCGR=1,PEN=x,
PROTVAR=ECMAV2,SEGMENT=1;ACT-DSSU:UL,PEN,x;

COPY-PRODE:PVCD,1;

/* PRODE change (example)*/
CHANGE-PRODE:KIND=PD,PDNAME=PD14,SEC=WELMAND,
SETNO=46,B02=00;

CHANGE-PRODE:KIND=PD,PDNAME=PD14,SEC=WELMAND,
SETNO=46,B12=E0;

CHANGE-PRODE:PD,PD14,ORG,,Y;

/* Timers */
CHANGE-PRODE:PD,PD14,TIMER,T304,0,0;
CHANGE-PRODE:PD,PD14,TIMER,T302,0,0;
CHANGE-PRODE:PD,PD14,TIMER,T303,0,0;
CHANGE-PRODE:PD,PD14,ORG,,Y;

/* Route */
CHANGE-COT:20,COTDEL,COTN&BCCC&BLOC&ROPT;
CHANGE-COT:20,COTADD,LWNC&NORR&ANNC;

/* ANNC,DTNI or DTNE*/
CHANGE-COSSU:LCOSV,1,,,NONE;

ADD-WABE:CD=647,DAR=CTDL;

CHANGE-RICHT:LRTE=647,ROUTOPT=NO,REROUT=NO,
MODE=LRTE;

CHANGE-RICHT:LRTE,647,ISDN-Step_by_Step,x;
```

```
ADD-LODR:ODR=6,CMD=END;

CHANGE-LDAT:LROUTE=6,LSVC=ALL,LRTEL=1,ODR=6;

/* System */
CHANGE-FEASU:D,VOICO;

/* Problem with voice compression */
CHANGE-ZAND:TYPE=TONES,CP=LOCANN,SIU=XX;
CHANGE-ZAND:TYPE=ALLDATA,COANN=YES;

END
```

10.55.5.2 Dial Pulsing Circuits (DIUC64) with ANSWER from the Trunk

```
ADD-WABE:CD=542,DAR=CTDL,CHECK=N;

ADD-BUEND:TGRP=242,NAME="Step_by_Step-DP-1",
NO=1, RSV=N,TRACENO=0,ACDTHRH=*,PRIONO=1,
CHARCON=NEUTRAL;

ADD-COP:COPNO=242,PAR=ANS&LSUP&RLSA&DTN&BR64
&NO1A&TIE&IDP1,TRK=TA,TOLL=TA;

ADD-COT:COTNO=242,PAR=RCL&ANS&TIE&IEVT&ANNC;

CHANGE-COT:COTNO=242,COTTYPE=COTADD,DEV=INDEP,
INFO="Step_by_Step-analog-DP";

ADD-COSSU:NEWCOS=220,AVCE=TA&TNOTCR&CDRSTN&CDRINT&
CDRC;

ADD-TACSU:PEN=1-2-67-22,COTNO=242,COPNO=242,DPLN=0,
ITR=0,COS=220,LCOSV=1,LCOSD=1,TGRP=242,COFIDX=0,
CTT="Step_by_Step-DP ",DESTNO=0,ALARMNO=0,CARRIER=1,
ZONE=EMPTY,INS=Y,DEVTYPE=TC,DEV=BWCISL,MFCVAR=0,
SUPPRESS=0,DGTCNT=0,TESTNO=1,CIRCIDX=11,CDRINT=1,
CCTINFO=0,DIALTYPE=DIP-DIP,DIALVAR=0-0,COEX=0

ADD-RICHT:MODE=LRTENEW,LRTE=242,LSVC=ALL,TGRP=242,
DNNO=1-1-100,REROUT=NO,ROUTATT=NO,INFO="Step_by_Step-DP";

ADD-LODR:ODR=7,CMD=END;

ADD-LDAT:LROUTE=242,LSVC=ALL,LVAL=1,TGRP=242,ODR=7,
LAUTH=1,CARRIER=1,ZONE=EMPTYLATTR=NONE,DNNO=1-1-100,
MSO=NONE,BANDW=1,VCCYC=4;

ADD-LDPLN:LDP="542",LROUTE=242,LAUTH=1;
```

10.55.5.3 DTMF Circuits (DIUC64) with ANSWER from the Trunk

```
ADD-WABE:CD=544,DAR=CTDL,CHECK=N;

ADD-BUEND:TGRP=244,NAME="Step_by_Step-DTMF-1",
NO=1,RSV=N,TRACENO=0,ACDTHRH=*,PRIONO=1,
CHARCON=NEUTRAL;

ADD-COP:COPNO=244,PAR=ANS&LSUP&RLSA&DTN&
DTMF&DTM1&NO1A&TIE&IDP1,TRK=TA,TOLL=TA;

ADD-COT:COTNO=244,PAR=RCL&ANS&TIE&IEVT&ANNC;

CHANGE-COT:COTNO=244,COTTYPE=COTADD,DEV=INDEP,
INFO="Step_by_Step-analog-DP";ADD-COSSU:NEWCOS=220,
AVCE=TA&TNOTCR&CDRSTN&CDRINT&CDRC;

ADD-TACSU:PEN=1-2-67-24,COTNO=244,COPNO=244,DPLN=0,
ITR=0,COS=220,LCOSV=1,LCOSD=1,TGRP=244,COFIDX=0,
CCT="Step_by_Step-DP ",DESTNO=0,ALARMNO=0,CARRIER=1,
ZONE=EMPTY,INS=Y,DEVTYPE=TC,DEV=BWCISL,MFCVAR=0,
SUPPRESS=0,DGTCNT=0,TESTNO=1,CIRCIDX=11,CDRINT=1,
CCTINFO=0,DIALTYPE=DTMF-DTMF,DIALVAR=0-0,COEX=0;

ADD-RICHT:MODE=LRTENEW,LRTE=244,LSVC=ALL,TGRP=244,
DNNO=1-1-100,REROUT=NO,ROUTATT=NO,INFO="Step_by_Step-DP";

ADD-LODR:ODR=7,CMD=END;

ADD-LDAT:LROUTE=244,LSVC=ALL,LVAL=1,TGRP=244,ODR=7,
LAUTH=1,CARRIER=1,ZONE=EMPTY,LATTR=NONE,DNNO=1-1-100,
MSO=NONE,BANDW=1,VCCYC=4;

ADD-LDPLN:LDP="544",LROUTE=244,LAUTH=1;
```

10.55.5.4 Dial Pulsing Circuits (TMEMW) with ANSWER from the Trunk

```
ADD-WABE:547,DAR=CTDL,TEST=NO;

ADD-BUEND:TGRP=247,NAME="Step_by_Step-DP-Tie_Trunk",
NO=1,RSV=N,TRACENO=0,ACDTHRH=*,PRIONO=1,
CHARCON=NEUTRAL;

ADD-COP:COPNO=247,PAR=ANS&LSUP&RLSA&DTN&BR64&
NO1A&TIE&IDP1,TRK=TA,TOLL=TA;

ADD-COT:COTNO=247,PAR=RCL&ANS&TIE&IEVT&ANNC;

CHANGE-COT:COTNO=247,COTTYPE=COTADD,DEV=INDEP,
INFO="Step_by_Step-analog-DP";

ADD-COSSU:NEWCOS=220,AVCE=TA&TNOTCR&CDRSTN&
```

```
CDRINT&CDRC;

ADD-TACSU:PEN=1-2-67-26,COTNO=247,COPNO=247,
DPLN=0,ITR=0,COS=220,LCOSV=1,LCOSD=1,TGRP=247,
COFIDX=0,CCT="Step_by_Step-DP-Tie_Trunk ",DESTNO=0,
ALARMNO=0,CARRIER=1,ZONE=EMPTY,INS=Y,DEVTYPE=TT,
DEV=TSEMU;

ADD-RICHT:MODE=LRTENEW,LRTE=247,LSVC=ALL,
TGRP=247,DNNO=1-1-100,REROUT=NO,ROUTATT=NO,
INFO="Step_by_Step-DP-Tie_Trunk";

ADD-LODR:ODR=7,CMD=END;

ADD-LDAT:LROUTE=247,LSVC=ALL,LVAL=1,TGRP=247,
ODR=7,LAUTH=1,CARRIER=1,ZONE=EMPTY,LATTR=NONE,
DNNO=1-1-100,MSO=NONE,BANDBR=1,
VCCYC=4;

ADD-LDPLN:LDP="547",LROUTE=242,LAUTH=1;
```

Circuits as DTMF (TMEMW) without ANSWER from the trunk

```
ADD-WABE:CD=549,DAR=CTDL,CHECK=N;

ADD-BUEND:TGRP=249,NAME="Step_by_Step-Tie-Trunk ",
NO=1,RSV=N,TRACENO=0,ACDTHRH=*,PRIONO=1,
CHARCON=NEUTRAL;

ADD-COP:COPNO=249,PAR=ANS&LSUP&RLSA&DTN&DTMF
&DTM1&NO1A&TIE&IDP1,TRK=TA,TOLL=TA;

ADD-COT:COTNO=249,PAR=RCL&ANS&TIE&IEVT&ANNC;

CHANGE-COT:COTNO=249,COTTYPE=COTADD,DEV=INDEP,
INFO="Step_by_Step-analog-DP";

ADD-COSSU:NEWCOS=220,AVCE=TA&TNOTCR&CDRSTN&
CDRINT&CDRC;

ADD-TACSU:PEN=1-2-67-28,COTNO=249,COPNO=249,
DPLN=0,ITR=0,COS=220,LCOSV=1,LCOSD=1,TGRP=249,
COFIDX=0,CCT="Step_by_Step-DTMF-Tie_Trunk ",
DESTNO=0,ALARMNO=0,CARRIER=1,ZONE=EMPTY,INS=Y,
DEVTYPE=TT,DEV=TSEMU;

ADD-RICHT:MODE=LRTENEW,LRTE=249,LSVC=ALL,TGRP=249,
DNNO=1-1-100,REROUT=NO,ROUTATT=NO,
INFO="Step_by_Step-DTMF-Tie_Trunk";

ADD-LODR:ODR=7,CMD=END;

ADD-LDAT:LROUTE=249,LSVC=ALL,LVAL=1,TGRP=249,
ODR=7,LAUTH=1,CARRIER=1,ZONE=EMPTY,LATTR=NONE,
DNNO=1-1-100,MSO=NONE,BANDW=1,VCCYC=4;
```

```
ADD-LDPLN:LDP="549",LROUTE=249,LAUTH=1;
```

10.55.5.5 Dial Pulsing Circuits (DIUC64) without ANSWER from the Trunk

```
ADD-WABE:CD=542,DAR=CTDL,CHECK=N;

ADD-BUEND:TGRP=242,NAME="Step_by_Step-DP-1",
NO=1,RSV=N,TRACENO=0,ACDTHRH=*,PRIONO=1,
CHARCON=NEUTRAL;

ADD-COP:COPNO=242,PAR=LSUP&RLSA&DTN&BR64&
NO1A&TIE&IDP1,TRK=TA,TOLL=TA;

ADD-COT:COTNO=242,PAR=RCL&TIE&IEVT&ANNC;

CHANGE-COT:COTNO=242,COTTYPE=COTADD,
DEV=INDEP,INFO="Step_by_Step-analog-DP";

ADD-COSSU:NEWCOS=220,AVCE=TA&TNOTCR&CDRSTN&
CDRINT&CDRC;

ADD-TACSU:PEN=1-2-67-22,COTNO=242,COPNO=242,
DPLN=0,ITR=0,COS=220,LCOSV=1,LCOSD=1,TGRP=242,
COFIDX=0,CCT="Step_by_Step-DP ",DESTNO=0,
ALARMNO=0,CARRIER=1,ZONE=EMPTY,INS=Y,DEVTYPE=TC,
DEV=BWCISL,MFCVAR=0,SUPPRESS=0,DGTCNT=0,TESTNO=1,
CIRCIDX=11,CDRINT=1,CCTINFO=0,DIALTYPE=DIP-DIP,
DIALVAR=0-0,COEX=0;

ADD-RICHT:MODE=LRTENEW,LRTE=242,LSVC=ALL,
TGRP=242,DNNO=1-1-100,REROUT=NO,ROUTATT=NO,
INFO="Step_by_Step-DP";

ADD-LODR:ODR=7,CMD=END;

ADD-LDAT:LROUTE=242,LSVC=ALL,LVAL=1,TGRP=242,
ODR=7,LAUTH=1,CARRIER=1,ZONE=EMPTY,LATTR=NONE,
DNNO=1-1-100,MSO=NONE,BANDW=1,VCCYC=4;

ADD-LDPLN:LDP="542",LROUTE=242,LAUTH=1;
```

10.55.5.6 DTMF Circuits (DIUC64) without ANSWER from the Trunk

```
ADD-WABE:CD=544,DAR=CTDL,CHECK=N;

ADD-BUEND:TGRP=244,NAME="Step_by_Step-DMTF-1",
NO=1,RSV=N,TRACENO=0,ACDTHRH=*,PRIONO=1,
CHARCON=NEUTRAL;ADD-COP:COPNO=244,PAR=LSUP&
RLSA&DTN&DTMF&DTM1&NO1A&TIE&IDP1,TRK=TA,TOLL=TA;

ADD-COT:COTNO=244,PAR=RCL&TIE&IEVT&ANNC;
```

```
CHANGE-COT:COTNO=244,COTTYPE=COTADD,
DEV=INDEP,INFO="Step_by_Step-analog-DP";

ADD-COSSU:NEWCOS=220,AVCE=TA&TNOTCR&CDRSTN
&CDRINT&CDRC;

ADD-TACSU:PEN=1-2-67-24,COTNO=244,COPNO=244,
DPLN=0,ITR=0,COS=220,LCOSV=1,LCOSD=1,TGRP=244,
COFIDX=0,CCT="Step_by_Step-DTMF",DESTNO=0,
ALARMNO=0,CARRIER=1,ZONE=EMPTY,INS=Y,DEVTYPE=TC,
DEV=BWCISL,MFCVAR=0,SUPPRESS=0,DGTCNT=0,TESTNO=1,
CIRCIDX=11,CDRINT=1,CCTINFO=0,DIALTYPE=DTMF-DTMF,
DIALVAR=0-0,COEX=0;

ADD-RICHT:MODE=LRTENEW,LRTE=244,LSVC=ALL,TGRP=244,
DNNO=1-1-100,REROUT=NO,ROUTATT=NO,
INFO="Step_by_Step-DTMF";

ADD-LODR:ODR=7,CMD=END;

ADD-LDAT:LROUTE=244,LSVC=ALL,LVAL=1,TGRP=244,
ODR=7,LAUTH=1,CARRIER=1,ZONE=EMPTY,LATTR=NONE,
DNNO=1-1-100,MSO=NONE,BANDW=1,VCCYC=4;

ADD-LDPLN:LDP="544",LROUTE=244,LAUTH=1;
```

10.55.5.7 Dial Pulsing Circuits (TMEMW) without ANSWER from the Trunk

```
ADD-WABE:CD=547,DAR=CTDL,CHECK=N;

ADD-BUEND:TGRP=247,NAME="Step_by_Step-DP-tie_trunk",
NO=1,RSV=N,TRACENO=0,ACDTHRH=*,PRIONO=1,
CHARCON=NEUTRAL;

ADD-COP:COPNO=247,PAR=LSUP&RLSA&DTN&BR64&NO1A&
TIE&IDP1,TRK=TA,TOLL=TA;

ADD-COT:COTNO=247,PAR=RCL&TIE&IEVT&ANNC;

CHANGE-COT:COTNO=247,COTTYPE=COTADD,DEV=INDEP,
INFO="Step_by_Step-analog-DP"";

ADD-COSSU:NEWCOS=220,AVCE=TA&TNOTCR&CDRSTN&
CDRINT&CDRC;

ADD-TACSU:PEN=1-2-67-26,COTNO=247,COPNO=247,
DPLN=0,ITR=0,COS=220,LCOSV=1,LCOSD=1,TGRP=247,
COFIDX=0,CCT="tep_by_step-DP-tie_trunk ",DESTNO=0,
ALARMNO=0,CARRIER=1,ZONE=EMPTY,INS=Y,DEVTYPE=TT,
DEV=TSEMU;

ADD-RICHT:MODE=LRTENEW,LRTE=247,LSVC=ALL,TGRP=247,
```

```
DNNO=1-1-100,REROUT=NO,ROUTATT=NO,
INFO="Step_by_Step-DP-tie_trunk";

ADD-LODR:ODR=7,CMD=END;

ADD-LDAT:LROUTE=247,LSVC=ALL,LVAL=1,TGRP=247,
ODR=7,LAUTH=1,CARRIER=1,ZONE=EMPTY,LATTR=NONE,
DNNO=1-1-100,MSO=NONE,BANDW=1,VCCYC=4;

ADD-LDPLN:LDP="547",LROUTE=242,LAUTH=1;
```

10.55.5.8 DTMF Circuits (TMEMW) without ANSWER from the Trunk

```
ADD-WABE:CD=549,DAR=CTDL,CHECK=N;

ADD-BUEND:TGRP=249,NAME="Step_by_Step-DMTF-Tie_Trunk"
,NO=1,RSV=N,TRACENO=0,ACDTHRH=*,PRIONO=1,
CHARCON=NEUTRAL;

ADD-COP:COPNO=249,PAR=LSUP&RLSA&DTN&DTMF&
DTM1&NO1A&TIE&IDP1,TRK=TA,TOLL=TA;

ADD-COT:COTNO=249,PAR=RCL&TIE&AEOD&IEVT&ANNC;

CHANGE-COT:COTNO=249,COTTYPE=COTADD,DEV=INDEP,
INFO="Step_by_Step-analog_DTMF";

ADD-COSSU:NEWCOS=220,AVCE=TA&TNOTCR&CDRSTN&
CDRINT&CDRC;

ADD-TACSU:PEN=1-2-67-28,COTNO=249,COPNO=249,
DPLN=0,ITR=0,COS=220,LCOSV=1,LCOSD=1,TGRP=249,
COFIDX=0,CCT="Step_by_Step-DTMF-Tie_trunk ",
DESTNO=0,ALARMNO=0,CARRIER=1,ZONE=EMPTY,INS=Y,
DEVTYPE=TT,DEV=TSEMU;

ADD-RICHT:MODE=LRTENEW,LRTE=249,LSVC=ALL,
TGRP=249,DNNO=1-1-100,REROUT=NO,ROUTATT=NO,
INFO="Step_by_Step-DMTF-Tie_Trunk";

ADD-LODR:ODR=7,CMD=END;

ADD-LDAT:LROUTE=249,LSVC=ALL,LVAL=1,TGRP=249,
ODR=7,LAUTH=1,CARRIER=1,ZONE=EMPTY,LATTR=NONE,
DNNO=1-1-100,MSO=NONE,BANDW=1,VCCYC=4;

ADD-LDPLN:LDP="549",LROUTE=249,LAUTH=1;
```

10.55.5.9 Configuration Data for Step by Step Dialing via ECMAV2 (Analog Dial Pulsing Circuit)

Prerequisite: ECMAV2 link for trunk group 72 (open numbering) is available on the system.

```
ADD-WABE:CD=546,DAR=CTDL,CHECK=N;

ADD-RICHT:MODE=LRTENEW,LRTE=246,LSVC=ALL,
NAME="TRANSIT-S2-SATFF",TGRP=72,DNNO=1-1-100,
REROUT=NO,ROUTATT=NO,CHARCON=NEUTRAL;

ADD-LDAT:LROUTE=246,LSVC=ALL,LVAL=1,TGRP=72,
ODR=246,LAUTH=1,CARRIER=1,ZONE=EMPTY,LATTR=NONE,
DNNO=1-1-100,MSO=NONE,BANDW=1,VCCYC=4;

ADD-LODR:ODR=246,CMD=OUTPULSE,DGTS=542;
ADD-LDPLN:LDP="546",LROUTE=246,LAUTH=1;
```

10.55.5.10 Configuration Data for Step by Step Dialing via ECMAV2 (DTMF analog)

Prerequisite: ECMAV2 link for trunk group 72 (open numbering) is available on the system.

```
ADD-WABE:CD=551,DAR=CTDL,CHECK=N;

ADD-RICHT:ART=LRTENEW,LRTE=251,LSVC=ALL,
NAME="TRANSIT-S2-Step_by_Step",TGRP=72,
DNNO=1-1-100,REROUT=NO,ROUTATT=NO,
CHARCON=NEUTRAL;

ADD-LDAT:LROUTE=251,LSVC=ALL,LVAL=1,TGRP=72,
ODR=251,LAUTH=1,CARRIER=1,ZONE=EMPTY,
LATTR=NONE,DNNO=1-1-100,MSO=NONE,BANDW=1,
VCCYC=4;

ADD-LODR:ODR=251,CMD=OUTPULSE,DGTS=544;

ADD-LDPLN:LDP="551",LROUTE=251,LAUTH=1;
```

10.56 Suffix Dialing

10.56.1 Feature Description

The following deals with implementing OpenScape 4000 in the analog telephone networks of traffic enterprises: Bundes-Autobahnen (AB, German federal motorways), Deutsche Bundesbahn (DB, German Federal Railways), Deutsche Reichsbahn (DR, German Reichsbahn) und Wasserstraßen- und Schiffahrts-Direktion (WSD, Waterways and Shipping Authority), Energie Versorgungs Unternehmen (EVU, Power and Utilities) and for the following

countries: CIS, Poland and Italy. Here the subscriber can continue to dial in to the analog network (suffix-dialing) even after the OpenScape 4000 has received an "answer" signal. Suffix-dialing is possible from analog (dial pulsing) and digital terminals and from ACs.

A maximum of 22 digits can be transmitted.

The parameter DPSTN must be maintained in the COS of all trunks in all OpenScape 4000s. The parameter must always be set for S0/S2 circuits.

Access to the analog telephone network is achieved via digital tie trunks with CAS (TFZ or EB5/NAL signaling), or indirectly via one or more transit nodes. These transit nodes must be networked via digital tie trunks with S2 (CorNet-N protocol). The analog trunks are connected to the digital CAS interface via primary multiplexers (PMUX) in the case of TFZ signaling and via signal converters in the case of EB5/NAL signaling. Incoming trunk calls via EB5 systems can be returned to the EB5 attendant console by the called OpenScape 4000 subscriber by dialing the flashing code. EB5 subscribers can intrude on OpenScape 4000 subscriber calls if the subscriber dialed is busy. OpenScape 4000 subscribers, however, cannot intrude on EB5 subscriber calls. Another application is the connection of adapters for analog networks (AAN) to OpenScape 4000 via the TFZ interface.

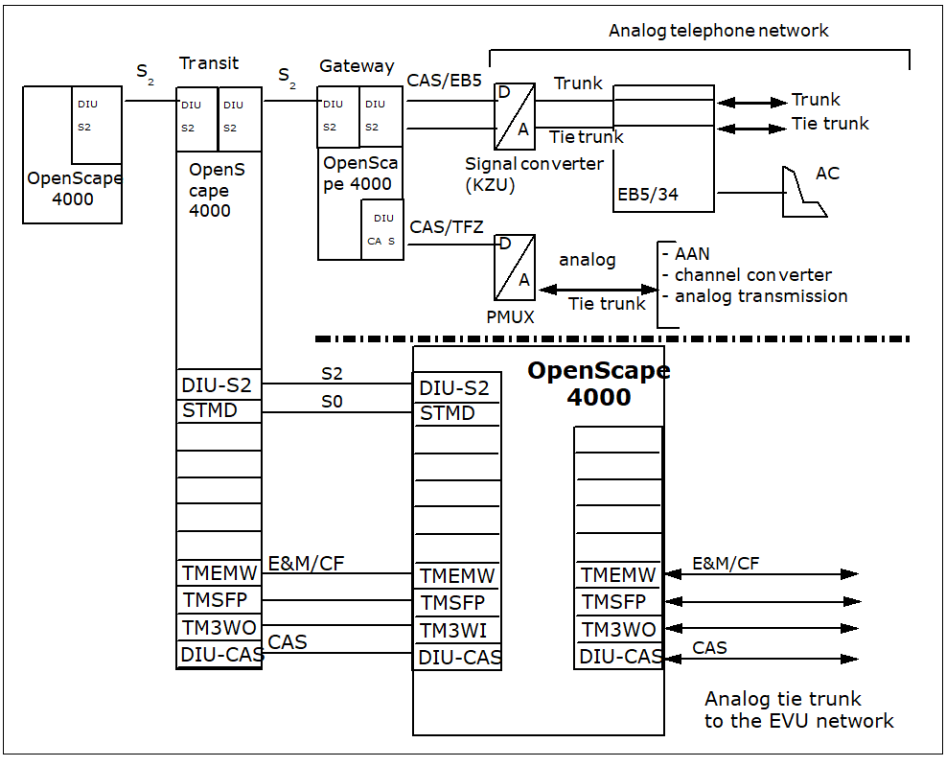


Figure 115: Example of connection and networking

Line circuit parameter USD

Analog trunk line circuits reserved for reverse dialing in incoming traffic must be prepared in the class of trunk (COT) with the USD circuit parameter for unrestricted suffix-dialing. This is not necessary for outgoing step by step dialing in tie trunk traffic.

- You can expand the class of trunk for unrestricted suffix-dialing as follows:
  `CHA-COT:COTNO=x,COTTYPE=COTADD,PAR=USD;`

RICHT parameters

The RICHT parameters **ROUTOPT=NO** and **REROUT=NO** must be set.

LODR parameters

The configured LODR should begin with **COXSEND**.

Digit input timer

The digit input timer T302 for digital trunks (S0/S2) must be extended to 30 seconds.

10.56.2 Flashing Signal at AC

Digit analysis result OUTPULSE

The digit analysis result OUTPULSE is designed to send digits, in this case for "flashing signal at AC" on the EB5 system. The only call progress state permitted is consultation hold (CPS 9).

- You can configure the code for flashing in the AMO WABE as follows:
  `ADD-WABE:STNO=x,CPS=9,DAR=OUTPULSE;`

Line circuit parameter FLAC

EB5/NAL line circuits reserved for external transit traffic must be released for flashing in the class of trunk (COT) with the line circuit parameter FLAC. The line circuit parameter FLAC may not be set for tie trunk traffic.

- You can expand the class of trunk for flashing as follows:
  `CHA-COT:COTNO=x,COTTYPE=COTADD,PAR=FLAC;`

10.56.3 Busy Override

Line circuit parameter OVR

EB5/NAL line circuits must be released for busy override in the class of trunk (COT) with the line circuit parameter OVR. The line circuit parameter OVR should not be set for TFZ line circuits.

- You can expand the class of trunk for busy override as follows:
  `CHA-COT:COTNO=x,COTTYPE=COTADD,PAR=OVR;`

10.56.4 TFZ Signaling

TFZ signaling has been developed for the digital interface between OpenScape 4000 and the special telephone networks of the traffic enterprises.

Loadware variant 5

The loadware with TFZ signaling for the DIUC boards must be available on the OpenScape 4000 system hard disk:

:PDS:APSP/LTG/LG57/PZFDCAS5 (for DIUC Q2185)

- You can configure the DIUC board with loadware variant 5 as follows:

  DIUC64:

  ```
  ADD-BCSU:TYPE=DIU,LTG=gg,LTU=uu,SLOT=bbb,
  PARTNO="Q2185-X",LWVAR=5;
  ```
- The loadware variant can be subsequently assigned as follows:

  DIUC64 (Q2185):

  ```
  CHA-ZAND:TYPE=LOADWARE,LWTYPE=DCAS,LWVAR=5;
  (for DIUC Q2185)
  ```

  IMPORTANT: To load the LWVAR, the board with the AMO BSSU must be switched off and on again.

Device TSTFZ

The following example shows the configuration of TFZ tie trunk circuits with suffix-dialing.

- You can configure the class of trunk for TFZ tie trunk circuits as follows:
  `ADD-COT:COTNO=x,PAR=AND&USD;`
- You can configure the trunk parameter circuits for TFZ tie trunk circuits as follows:

  ```
  ADD-COP:COPNO=x,PAR=SDL&BR64&NO1A&IDP3&MSG&
  RLSA&RLSB&LSUP&TIE;
  ```
- You can configure the TFZ trunk group for tie trunk traffic (for example 30 circuits) as follows:
  `ADD-BUEND:TGRP=x,NAME="TFZ-TIE",NO=30;`
- You can configure 30 tie trunk circuits with TFZ signaling as follows:

  ```
  ADD-TACSU:NO=30,PEN=gg-uu-bbb-1,COTNO=x,
  COPNO=x,TGRP=x,DEVTYPE=AS,DEV=QSTFZ;
  ```

PTIME init block for device TSTFZ

The initialization data for the device TSTFZ are saved on the hard disk in init block 40 (see AMO PTIME). The data are loaded automatically from the AMO TACSU. To change a fixed default value (for example two-way, incoming), the following steps must be taken:

- Load init timer block 40 from the hard disk into the DB (into TBLK 11, for example) with:
  `COPY-PTIME:INIBLOCK=40,TBLK=11;`
- You can change the value for parameter 3 with:
  `CHA-PTIME:TYPE=REST,TBLK=11,BTYPE=PARA,P3=2;`
- You can assign the new timer block 11 to all trunk groups as follows:

  ```
  CHA-TACSU:PEN=gg-uu-bbb-ss,DEVTYPE=AS,
  DEV=TSTFZ,CIRCIDX=11;
  ```

  IMPORTANT: To load the new parameters, all relevant circuits with the AMO DSSU must be switched off and on

again. Alternatively, you can also selectively assign the modified timer block when configuring the circuits.

10.56.5 EB5/NAL signaling

EB5/NAL signaling is designed for the digital interface between OpenScape 4000 and the two-motion selector system EB5/34 from Deutsche Reichsbahn (DR).

Loadware variant 5

The loadware with EB5/NAL signaling for the DIUC boards must be configured on the OpenScape 4000 system hard disk as follows:

1) :PDS:APSP/LTG/LG57/PZFDCAS5 (for DIUC Q2185)

- You can configure the DIUC boards with loadware variant 5 as follows:

  DIUC64:

  ```
  ADD-BCSU:TYPE=DIU,LTG=gg,LTU=uu,SLOT=bbb,
  PARTNO="Q2185-X",LWVAR=5;
  ```
- The loadware variant can be subsequently assigned as follows:

  DIUC64 (Q2185):

  ```
  CHA-ZAND:TYPE=LOADWARE,LWTYPE=DCAS,LWVAR=5;
  (for DIUC Q2185)
  ```

IMPORTANT: To load the LWVAR, the board with the AMO BSSU must be switched off and on again.

Device EB5NAL

For incoming traffic, the OpenScape 4000 needs to distinguish between external transit traffic and tie trunk traffic so that a flashing signal is only sent in the case of incoming external traffic. In the case of OpenScape 4000 incoming seizure, EB5 signal generation offers no criteria for distinguishing between the various types of traffic. Therefore, the traffic must be channeled according to its origin into 2 separate trunk groups in the EB5 and must also be implemented in this form in the OpenScape 4000. Both trunks can be on the same DIUC. The following example shows the configuration of EB5/NAL trunk circuits with busy override and flashing.

- You can configure the class of trunk for EB5/NAL trunk circuits as follows:
  `ADD-COT:COTNO=x,PAR=ANS&USD&OVR&FLAC;`
- You can configure the line parameter class for EB5/NAL trunk circuits as follows:

  ```
  ADD-COP:COPNO=x,PAR=SDL&BR64&NO1A&IDP3&MSG&
  RLSA&LSUP;
  ```
- You can configure the EB5/NAL trunk group for tie trunk traffic (for example 30 circuits) as follows:
  `ADD-BUEND:TGRP=x,NAME="EB5-CO",NO=30;`
- You can configure 30 trunk circuits with EB5/NAL signaling as follows:

```
ADD-TACSU:NO=30,PEN=gg-uu-bbb-1,COTNO=x,COPNO=x,
TGRP=x,DEVTYPE=AS,DEV=EB5NAL;
```

The following example shows the configuration of EB5/NAL tie trunk circuits with busy override and suffix-dialing (the difference between trunk traffic and tie trunk traffic is determined via the trunk parameter "TIE").

- You can configure the class of trunk for EB5/NAL tie trunk circuits as follows:
  `ADD-COT:COTNO=x,PAR=ANS&USD&OVR;`
- You can configure the line parameter class for EB5/NAL tie trunk circuits as follows:

  ```
  ADD-COP:COPNO=x,PAR=SDL&BR64&NO1A&IDP3&MSG&
  RLSA&LSUP&TIE;
  ```
- You can configure the EB5/NAL trunk group for tie trunk traffic (for example 30 circuits) as follows:
  `ADD-BUEND:TGRP=x,NAME="EB5--TIE",NO=30;`
- You can configure 30 tie trunk circuits with EB5/NAL signaling as follows:

  ```
  ADD-TACSU:NO=30,PEN=gg-uu-bbb-33,COTNO=x,COPNO=x,
  TGRP=x,DEVTYPE=AS,DEV=EB5NAL;
  ```

PTIME init block for device EB5NAL

The initialization data for the device EB5NAL are saved on the hard disk in init block 41 (see AMO PTIME). The data are loaded automatically by the AMO TACSU. To change a fixed default value (for example two-way, incoming), the following steps must be taken:

- Load init timer block 41 from the hard disk into the DB (into TBLK 12, for example) with:
  `COPY-PTIME:INIBLOCK=41,TBLK=12;`
- You can change the value for the parameter P3 as follows:
  `CHA-PTIME:TYPE=REST,TBLK=12,BTYPE=PARA,P3=2;`
- You can assign the new timer block 12 to all circuits of the trunk group with:

  ```
  CHA-TACSU:PEN=gg-uu-bbb-ss,DEVTYPE=AS,DEV=EB5NAL,
  CIRCIDX=12;
  ```

IMPORTANT: To load the new parameters, all relevant circuits with AMO DSSU must be switched off and on again. You can also selectively assign the changed timer block when configuring the circuits.

10.57 Suppression of the FWD Destination at the Caller's Display

10.57.1 Feature Description

The station dialed is still displayed on the caller's terminal even though call forwarding, forwarding on busy, or call forwarding - no answer has been activated at the destination.

10.57.2 Service Information

- Refer to station number suppression as explained in the chapter on display suppression.

10.57.3 Generation (Example)

- Activate display suppression as follows:

	Configuration Management --> Tables --> Traffic Restrictions Group, click New. Enter group, then select "Suppress Display on Call Forward" in the Basic Data tab and save.
	Set display suppression with the AMO VBZGR, parameter value CFW. `ADD-VBZGR:GROUP=<ITR_group>,TYPE=CFW;`

This command accomplishes the following: When there are calls to a user in this internal traffic restriction (ITR) group with call forwarding (FWD), call forwarding on busy (CFB), or call forwarding - no answer (CFNR) to another destination, the caller still sees the dialed number on the display, regardless of where the call is forwarded.

- Deactivate display suppression as follows:

	Configuration Management --> Tables --> Traffic Restrictions Group, click New. Enter group, then deselect "Suppress Display on Call Forward" in the Basic Data tab and save.
	Delete with the AMO VBZGR, parameter value CFW. `DEL-VBZGR:GROUP=<ITR_group>,TYPE=CFW;`

Once this command has been executed, the actual destination number is displayed on the caller's terminal when he or she calls a member of this ITR group with activated FWD, CFB, or CFNR.

10.57.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
VBZGR	GROUP	d	VERKEHRSBEZIEHUNGS/WABE-GRUPPENNUMMER
	GROUP	e	INTERNAL TRAFFIC RESTRICTION OR DIAL PLAN GROUP
	TYP	d	EINTRAGSTYP, VERZWEIGUNGSPARAMETER CFW = CALL-FORWARDING
	TYPE	e	DESIRED HOTLINE/OFFHOOK RECALL OPTION CFW = CALL-FORWARDING

10.58 Transfer before Answer ex Call State

Station A dials the number of an external station B (1st Call). If station A has a special authorization he can enter consultation state before end of dialing and e.g. call station C in the network or station D internally. Station A can transfer the calls after one of the dialed parties has answered.

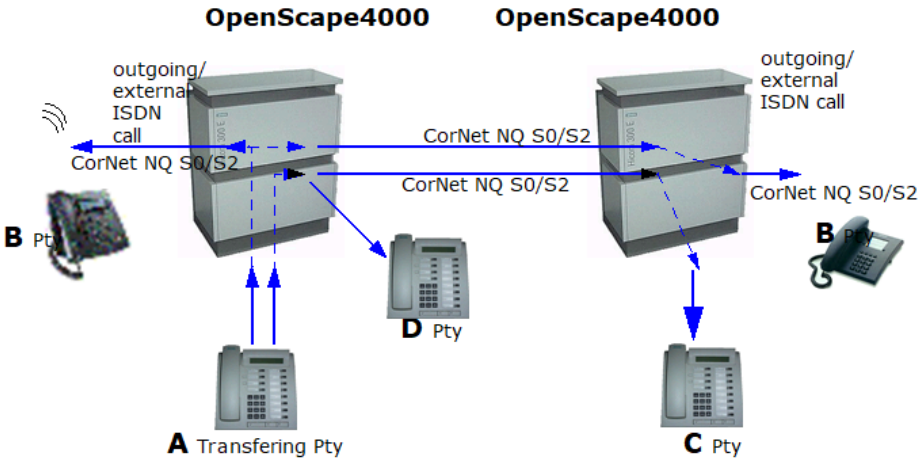


Figure 116: Transfer before Answer ex Call State

10.58.1 Feature Description

The parameter **XFBADIAL** in AMO FEASU activates this feature centrally in a system. It allows consultation hold before end of dialing for the first connection.

Alternatively, this feature can be activated using the parameter **XFBACALL** in AMO FEASU. This feature allows consultation call either after end of dialing (free or non-evaluated) for the first connection or from the time when the call was routed into the analog network.

Only one of the two parameters may be set.

The second alternative must be used, if features such as returning FWD/BUSY, LCR rerouting or LCR expensive routing are to be used on the S0/S2 trunk group of the first connection.

To prevent unauthorized use of this feature the parameter **SUTVA** in AMO COSSU can be configured.

In order to be able to use "Transfer before Answer ex Call State" for outgoing trunk and tie traffic, the COT parameter **TRBA** must be set locally in the S0/S2 B channel trunk group of the first connection in the originating node. It is of no importance whether the first connection is routed in the own or an external network (e.g. PTT) or whether the called party is located in the own or an external network.

Consultation call for an outgoing connection via S0/S2 activated by an authorized station for a voice service can be initiated only after the system received the acknowledgment of the first connection and the FEASU parameter "Extension Transfer Before Answer ex Dial State" is set. An ANATE can initiate consultation call without consultation key only after it received the end of dialing

(free or non-evaluated) acknowledgment, as the consultation function is derived from the dialing information.

Otherwise, consultation call for an outgoing connection via S0/S2 activated by an authorized station for a voice service can be initiated only after the system received the end of dialing (free or non-evaluated) acknowledgment of the first connection, or from the time when the call was routed into the analog network and the parameter **XFBACALL** in AMO FEASU is set.

IMPORTANT: Up to now consultation call could only be initiated from the station after the first call entered talk state.

If the outgoing S0/S2 first connection (preferably a trunk call) is in call state or digit-sequence transmission, the A station can transfer the first connection to station C who is on consultation hold and has answered. Station C can be located internally in the system or in a network which is connected via S0/S2.

The first call (via S0/S2) can only be transferred, if one of the two connections is in talk state.

10.58.2 Service Information

This feature does not support networking trunks with extension loop signalling and all analog tie and trunk signalling on the first connection (without voice connection).

This feature is **not** supported to Functional Devices (including SIP phones).

This feature is **not** supported if rerouting is active (AMO RICHT, **REREOUT=YES**). Use of AMO COSSU parameter **LCRET=ALCROPT** also behaves as if rerouting is active.

This feature is also not supported on networking trunks with extension loop signalling and all analog tie and trunk signalling on the consultation connection (with voice connection) and on the first connection via S0/S2 (without voice connection).

If an outgoing unanswered S0/S2 first connection (trunk call) enters busy state or the connection was released backwards, initiation of consultation call or call transfer is not possible.

If both connections (first connection via S0/S2 and the consultation connection) are in call state and the call is transferred by going on hook, the consultation connection is released forward and the call is signalled at the transferring station. If transfer was activated by key "NOT POSSIBLE" is displayed.

As the user interface shows "NOT POSSIBLE" in negative call transfer cases, call transfer should be activated by key instead of going on hook.

If call transfer is initiated by going on hook the user should make certain, that one of the connections is in talk state to avoid negative cases.

If the first connection is in talk state, consultation call and call transfer from the station as well as other services are handled as previously.

If the first call has not yet answered and the DIGITE activates the CLEAR/ CANCEL or TOGGLE key, the consulted party is released and the station enters the current state of the first connection.

If the consulted party dials before the first connection answers, the following DAR are set to "NOT POSSIBLE":

WABE	OUTPULSE	Outpulse specific digits during call
	OPROVR	Demand to override by co-operator
	EXTANS	Interception by AC in partner system
	VMOWN	Operation of the VM for the user
	VMFOR	Access to other ('foreign') users' voice mailbox
	DOORCL	Answering a door call
	ANSINT	Answering device, internal
	RA	Recorded announcement for a certain area
	PU	Call pickup
DNIT	DNI	Directory number information table

If the feature "Direct trunk select" is active on the first connection, "Transfer before Answer ex Call State" cannot be activated.

Should the first connection lead to a text/fax server or to a VMS or PMS, which is known to the originating PBX, "Transfer before Answer ex Call State" cannot be activated.

If consultation was initiated before the first connection answers, the following reactions are carried out:

- any FWD or FNA is suppressed at the consulting party
- if an executive/secretary system is called, the executive is called and not the secretary
- a master hunting group is suppressed, i.e. only the master station is called. The call is not transferred to another station in the master hunting group.

Consultation call via the same line is not possible. Instead, consultation call is established via a different B channel.

The feature "Transfer before Answer ex Call State" doesn't support DSS1 phones neither in their active (transferring party) nor in their passive (consulted party) function.

10.58.3 Effects on other features

- If the parameter **XFBACALL** in AMO FEASU is set, the following features are either deactivated or are no longer possible on the first connection (via S0/S2) if consultation is initiated before end-of-dialing on the first connection:
  - LCR rerouting
  - returning call forwarding
  - returning deflection of busy calls

- If the parameter **XFBADIAL** in AMO FEASU is set alternatively, the following features are either deactivated or are no longer possible on the first connection (via S0/S2):

  – returning call forwarding no answer

  A second B channel is used for consultation.

  This feature cannot be used with first connection with Release Control.

  If the feature "Emergency disconnect after internal dialing" is active on the first connection, Transfer before Answer ex Call State cannot be activated.

  If consultation before answer was activated on the outgoing first connection the features e.g. Call Park, Override/Camp-on, Callback cannot be activated on the first connection. These features can be used again, as soon as the station returns to the first connection. Only answered calls can be parked. On the consulting party's side the DAR "NOT POSSIBLE" are displayed, i.e. the feature is not supported.

  If consultation before answer was activated on the outgoing first connection, the consultation connection is override protected. This protection applies after call transfer. It is released, when the initial connection answers.

  After transfer the consulting partner cannot finish incomplete dialing to the first destination.

  If consultation before answer was initiated on the outgoing first connection, a conference before answer on the outgoing first connection is not possible.

  Fixed DTMF dialing on the first connection must not be configured (AMO Richt).

10.58.4 Service Information

- An operational PABX is required, i.e. an S0/S2 trunk and tie line (CorNet-NQ) must be configured and 1operational. Basic internal traffic capabilities, including consultation and external consultation calls via S0/S2, must be configured and likewise operational.
- S0/S2 B channel transfer (first connection is talk state) must be configured and operational.
- Only **XFBADIAL** or **XFBACALL** may be set in the AMO FEASU.
- For subscriber-specific release please refer to Chapter 130, "On Hook Transfer per User or a Group of Users".

10.58.5 Generation

- Consultation can be activated either after end of dialing (free or unevaluated) on the first connection or from the time the call was routed to the analog network.

```
CHA-ZAND:TYPE=ALLDATA,TRANSFER=EXTEND;
 CHA-FEASU:TYPE=A,CM=XFBACALL;
 CHA-COSSU:TYPE=COS,COS=xx,AVCE=SUTVA;
 CHA-COT:COTNO=xx,COTTYPE=COTADD,PAR=TRBA;
```

- Alternatively, consultation can be activated before end of dialing on the first connection.

```
CHA-ZAND:TYPE=ALLDATA,TRANSFER=EXTEND;
```

```
CHA-FEASU:TYPE=A,CM=XFBADIAL;
CHA-COSSU:TYPE=COS,COS=xx,AVCE=SUTVA;
CHA-COT:COTNO=xx,COTTYPE=COTADD,PAR=TRBA;
```

10.58.6 Relevant AMOs

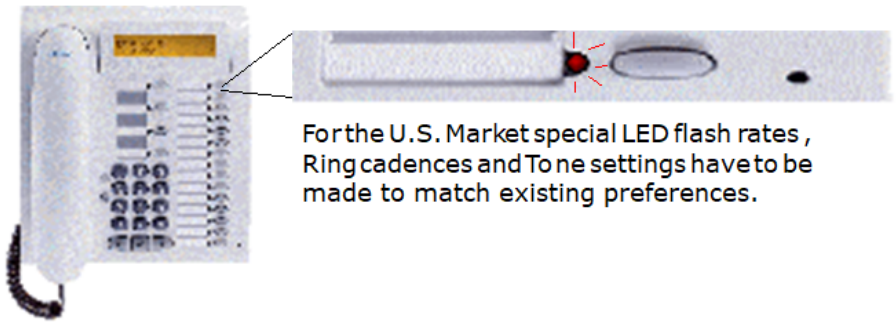
AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
COSSU	TUEVM	d	Berechtigten Teilnehmern ist es erlaubt, eine gehende Erstverbindung via S0/S2 Sätzen im Wahl-oder Rufzustand, der gehenden Rückfrageverbindung (im Gesprächszustand) zu übergeben.
	SUTVA	e	Authorized stations can transfer an outgoing first connection in dialing or call state to the outgoing consultation connection (in talk state) via S0/S2 trunks.
COT	UEVM	d	Dieser Satz bzw. Sätze erlaubt es berechtigten Teilnehmern eine gehende Erstverbindung via S0/S2 Sätzen im Wahl-oder Rufzustand, der gehenden Rückfrageverbindung (im Gesprächszustand) zu übergeben.
	TRBA	e	Using this/these trunk(s) authorized stations can transfer an outgoing first connection in dialing or call state to the outgoing consultation connection (in talk state) via S0/S2 trunks.
FEASU	TRVARUF	d	In der Anlage ist es Teilnehmern erlaubt, eine gehende Erstverbindung via S0/S2 Sätzen im Rufzustand der gehenden Rückfrageverbindung (im Gesprächszustand) zu übergeben.
	XFBACALL	e	Stations in this PBX can transfer an outgoing first connection in call state to the outgoing consultation connection (in talk state) via S0/S2 trunks.
	TRVAWAHL		In der Anlage ist es Teilnehmern erlaubt, eine gehende Erstverbindung via S0/S2 Sätzen im Wahlzustand (Zielrufnummer muss komplett sein) der gehenden Rückfrageverbindung (im Gesprächszustand) zu übergeben.

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
	XFBADIAL	e	Stations in this PBX can transfer an outgoing first connection in dialing state (destination number must be dialed completely) to the outgoing consultation connection (in talk state) via S0/S2 trunks
ZAND	UEBERG		In der Anlage können alle Teilnehmer übergeben.
	EXTEND	e	All stations in this PBX can transfer calls.

10.59 User Signaling for the U.S. Market

10.59.1 Feature Description

The system is able to support the special ring, LED and tone cadences that are familiar in the U.S. systems.



The intent of this document is to provide the administration required to implement the U.S. type LED cadences, ringing and tones.

10.59.2 User Interface

There is no specific user interface for this feature. All features will work the same except for the LED, ringing and tones required for the U.S. market.

10.59.3 Service Information

- This feature is intended for the global marketplace.
- The emphasis for this feature relates primarily to the U.S. marketplace. However ther may be occasions where this feature is required in other countries e.g. U.S companies in the I.M.

10.59.4 Generation (Example)

10.59.4.1 LED Handling

- The following settings are required in order to receive the correct LED cadences for US installations.

```
CHANGE-ZAND:TYPE=LEDTYPE,RINGING=MEDIUM;

CHANGE-ZAND:TYPE=LEDTYPE,HELD=WINK;

CHANGE-ZAND:TYPE=LEDTYPE,CALLFWD=VERYFAST;

CHANGE-ZAND:TYPE=LEDTYPE,FEATURE=MEDIUM;

CHANGE-ZAND:TYPE=LEDTYPE,PRIORITY=VERYFAST;
```

The following tables show the relationship between the database, the amo parameters, and the actual cadences.

Table 63: Default Initialisation of LEDs for I.M

LED Function	RATE	LED	CADENCE
		ON(ms)	OFF(ms)
Feature DB_LED_OP_BLINKEN_LANGSAM)	SLOW	750	750
Priority DB_LED_OP_BLINKEN_SCHNELL)	FAST	250	250
Ringing DB_LED_OP_RING	FAST	250	250
Held DB_LED_OP_RING	SLOW	750	750
Callfwd DB_LED_OP_CALL_FORWARD	OFF	0	100

Table 64: Settings required for U.S. Market

LED Function	RATE	LED	CADENCE
		ON(ms)	OFF(ms)
Feature DB_LED_OP_BLINKEN_LANGSAM)	MEDIUM	500	500
Priority DB_LED_OP_BLINKEN_SCHNELL)	VERYFAST	50	50
Ringing DB_LED_OP_RING	MEDIUM	500	500
Held DB_LED_OP_HELD	WINK	450	50

LED Function	RATE	LED	CADENCE
		ON(ms)	OFF(ms)
Callfwd DB_LED_OP_CALL_FORWARD	VERYFAST	50	50

10.59.4.2 Ring Cadences

In order to receive the US ring cadences the following must be done.

- For digital devices the following command allows usage of hard coded ring cadences for usage in the US.
  `CHANGE-ZAND:TYPE=ALLDATA2,USRINGTY=K;`
- For anate stations the ring cadences are hard coded in the loadware. In order to access this branch of the loadware the following ZAND command is used.
  `CHANGE-ZAND:TYPE=ALLDATA,CNTRYCD=K;`

  IMPORTANT: The programming of the ring cadences by PTIME will have no affect when these parameter are set to K.

- In order for the appropriate rings to be given for the US features the following ZAND command is used.
  `CHANGE-ZAND:TYPE=RNGTYPE,DSS=TRPR,FWD=TRPR,EXTCO=DBLR1,`

  `NORM=SGLR1,RMDCALL=SGLR2,NVCE=SGLR2,MSGRCALL=PRR,MT=MTR,`

  `CBK=TRPR,RECALL=TRPR,COMGROUP=SGLR2;`

  IMPORTANT: Even though the parameters above suggest single, double and triple rings this is not true for the hardcoded US ringtypes. For example DBLR2, SGLR2 are actually triple rings.

  U.S Ring Cadences

Ringtype	Ring	Cadence	Pattern
	on	off	
SGLR1	100 ms	3000 ms	Repeat
SGLR2	250 ms	250 ms	
	250 ms	250 ms	
	1000 ms	2000 ms	Repeat
DBLR1	250 ms	500 ms	
	250 ms	3000 ms	Repeat
DBLR2	250 ms	250 ms	

Ringtype	Ring	Cadence	Pattern
	on	off	
	250 ms	250 ms	
	250 ms		Stop
TRPR	250 ms	250 ms	
	250 ms	250 ms	
	250 ms	2750 ms	Repeat

10.59.4.3 Tones on Display Phones:

- In order to receive tones on display phones the following ZAND parameter must be set.
  ```
  CHANGE-ZAND:TYPE=ALLDATA2,DISPTONE=YES;
  ```

10.59.4.3.1 Campon

- In order to receive the US campon beeps the following ZAND parameter must be set.
  ```
  CHANGE-ZAND:TYPE=ALLDATA2,CAMPON=YES;
  ```
- Additionally to control the interval between campon beeps the following DTIM2 command is used.
  ```
  CHANGE-DTIM2:TYPEDH=GEN,CMPOBEEP=60; /*60 = seconds
   between
  beeps*/
  ```

10.59.4.3.2 Trunk Dial Tone

In the US there is no specific external dial tone. Instead a pause in the internal dial tone after a trunk access code has been dialed.

- To control the duration of this pause the following DTIM2 command is used.
  ```
  CHANGE-DTIM2:TYPEDH=GEN,PAUSDIAL=400; /* 400  =
   milliseconds
  between beeps*/
  ```
- In order to have the tone set to the correct timeslot use the following commands.
  ```
  CHANGE-ZAND:TYPE=TONES,CP=SECDIALT,SIU=0; /* To give
   silence
  during the pause */
  ```

10.59.4.3.3 Confirmation Tone

- In order to receive the US confirmation tone the following ZAND parameter must be set.
  ```
  CHANGE-ZAND:TYPE=ALLDATA2,CONFTONE=YES;
  ```
- In order to have the tone set to the correct timeslot use the following commands.
  ```
  CHANGE-ZAND:TYPE=TONES,CP=REQDIALT,SIU=1;

  CHANGE-ZAND:TYPE=TONES,CP=RECDIALT,SIU=1;
  ```

10.59.4.3.4 Announcements

In order to receive the announcements, "Please holds the line" , " You have a message" the following parameters must be set.

- This command insures that the correct loadware in included.
  ```
  CHANGE-ZAND:TYPE=ALLDATA, SIUANN=D;
  ```
- These commands activate the announcements inside the system.
  ```
  CHANGE-ZAND:TYPE=ALLDATA, ANATESIG=RA;

  CHANGE-ZAND:TYPE=ALLDATA, HOLDTN=RA;
  ```
- In order to have the tone set to the correct timeslot use the following commands.
  ```
  CHANGE-ZAND:TYPE=TONES,CP=HOLDLINE,SIU=16; /* For
   "Please
  hold the line" */CHANGE-
  ZAND:TYPE=TONES,CP=HOLDLINE,SIU=21; /
  * For  "You have a message" */
  ```

10.59.4.3.5 Other loadware

- In order to get the correct loadware for the SIU, DTR, CONFC the following command is needed.
  ```
  CHANGE-ZAND:TYPE=TN,SIUC=K,DTR=K,RDS=0,CONFC=K;
  ```
- In order to get the correct operation of the U.S. conference feature the following command is needed.
  ```
  CHANGE-ZAND:TYPE=CONFC,CODE=ULAW;
  ```

10.59.5 Relevant AMOs

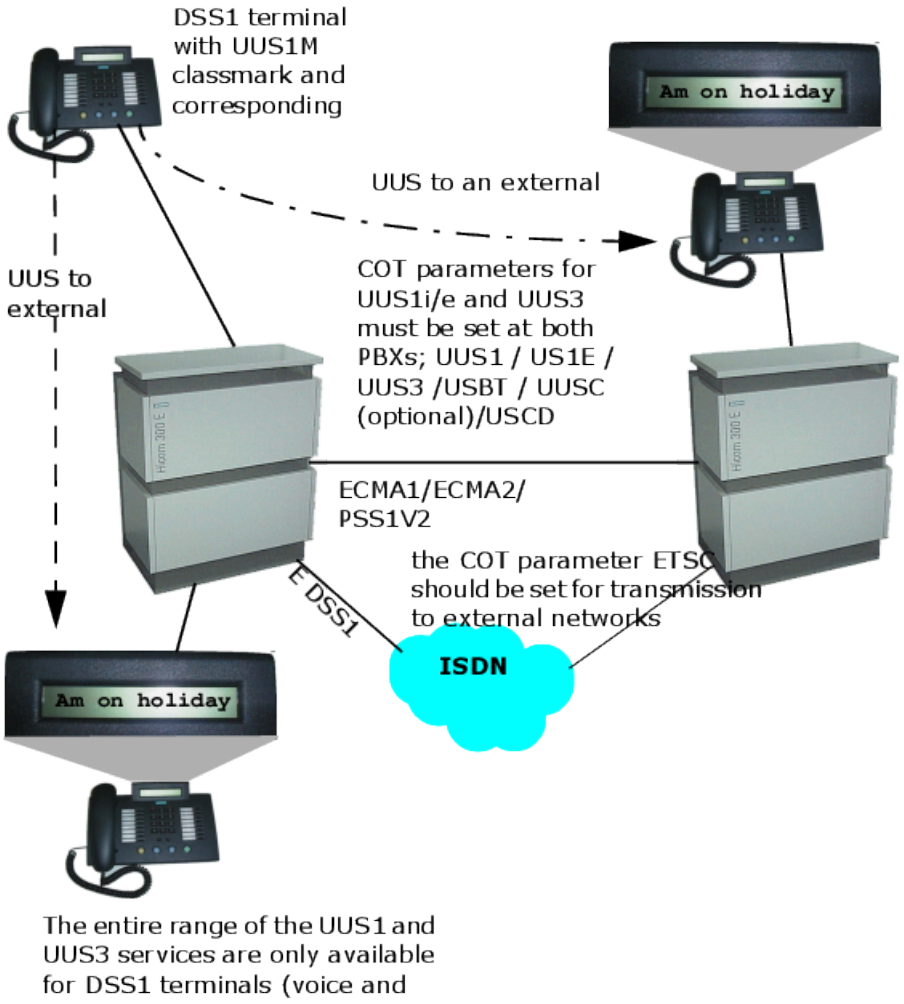
AMO	Parameter	Sprache/ Language	Beschreibung/ Description
ZAND	KLINGELN	d	LED-Anzeige bei kommendem Ruf
	RINGING	e	Led situation when a phone is ringing
	BESASS	d	LED-Anzeige bei gehaltener Leitung
	HELD	e	Led situation when a line is held
	ANRUFUML	d	Auf der Leitungstaste, wenn Call Forward aktiviert hat
	CALLFWD	e	On line key when line has call forward active
	PRIO	d	LED-Anzeige bei Dringlichkeitsanzeige
	PRIORITY	e	Led situation when urgency is indicated
	AUSGBTON	d	Ein/ausschalten von Tonen fuer Telefon mit Ausgabe
	DISPTONE	e	Act/deact Tones for display phones
	CAMPON	d	Ein/ausschalten Campon beep

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	CAMPON	e	Act/deact Camp-on beeps
	CPTON	d	Vermittlungstechnischer Ton
	CP	e	Call processing tone
	SIUTON	d	Zugeordneter Ton der SIU
	SIU	e	Assigned siu tones
	KENNL	d	Linearisierungs- und Kompandierungskennlinien bei der PCM-Kodierung/Dekodierung
	CODE	e	Speech coding
	CONFTONE	d	Ein/ausschalten beep Mechanism in DH
	CONFTONE	e	Act/deact beep mechanism in DH
	SIUSPKZ	d	Sprachkennzeichen für SIU-Texte und SWU-Displaytexte (kein VPL) einstellen
	SIUANN	e	Set options for SIU announcement texts
	HALTETON	d	Ton im Haltezustand (intern und extern)
	HOLDTN	e	Tone in hold state (internal and external)
	ANATESIG	d	Quittungssignalisierung am ANATE
	ANATESIG	e	Analog telephone user acknowledgement mode
	SIU	d	Auswahl der länderspezifischen SIU-Tontabelle
	SIUC	e	Selection of country-specific SIU tone table
	HZE	d	Auswahl der länderspezifischen HZE-Tabelle
	DTR	e	Selection of country-specific dial tone receiver table
	RDS	d	RDS Funktionalitaet
	RDS	e	RDS Functionality
DTIM2	ARTDH	d	Verzweigungs-parameter
	TYPEDH	e	Desired timer category
	CMPOBEEP	d	Cycle time of the beep cycle
	CMPOBEEP	e	Cycle time of the beep cycle

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	PAUSDIAL	d	Pause time between internal and second dial tone
	PAUSDIAL	e	Pause time between internal and second dial tone

10.60 User-to-User Service

With this service a limited data quantity can be transparently transmitted to the call partner. For this transmission the signaling channel (D channel) is used not the B channel.



10.60.1 Feature Description

The "User-to-User Service 1 Implicit" and "User-to-User Service 3" services are available for basic S0 access. Both conform to protocol requirements.

Applications for the UUS3 service are as yet unavailable. The UUS1 Implicit service, however, is supported by most ISDN terminals. It is used to transmit brief texts, e.g. "Am on holiday".

Which type of User-to-User service (UUS) is used depends on the program or terminal currently in use.

The following UUS are supported:

Service	supported	Effect on the connection	Effect on the application
UUS1i	yes	Although the remote system does **not** support this service the connection is established.	Loss of comfort, depending on the application.
UUS1e	no	If this service is not supported by the remote system the connection is not established.	No function
UUS2	no	The OpenScape 4000 rejects this service.	Connection is not established
UUS3 prefered	yes	Although the remote system does **not** support this service the connection is established.	Loss of comfort, depending on the application.
UUS3 required	yes	If this service is not supported by the remote system the connection is not established.	Connection is not established

The UUS differentiates between 'preferred' and 'required'. Connections requiring 'UUS preferred' are usually established even though the service might not be supported. On the other hand, connections requiring 'UUS required' are not established if the service is not available.

	implicit	explicit	
		preferred	required
UUS1		not implemented	not implemented
UUS2	not applicable	not implemented	not implemented
UUS3			

10.60.2 Service Information

- The entire range of this service is only available for DSS1 terminals.
- As an option, the service can be redirected (only possible with DSS1 terminals).
- The service cannot be transferred (Call Transfer)
- For the UUS to function flawlessly, the parameters UUS1 / US1E / UUS3 / USBT must be set in both PBXs.

- These parameters do not affect existing UUS services as used by CMI and network-wide CHESE.
- The ETSC parameter should be set for transmission to those networks where only messages in compliance with the ETSI protocol are sent.
- The following protocols allow the transmission of the entire User-to-USer signaling:

Netside:	EDSS1NET
User side:	EDSGER / EDSSUI / ETSI
Tie:	ECMA1 / ECMAV2 / PSS1V2.

- DPNSS1 does not support this feature.
- UUS should be allowed in the standard COT parameter sets.

10.60.3 Generation (Example)

10.60.3.1 AMO batch for DSS1 terminals

Configuration of UUS1 Implicit:

The calling party must have the classmark for UUS1 Implicit (UUS1IM). Only the calling party can activate this service. The called party does not require the classmark for UUS1 Implicit:

Provided, the COS number 6 is set for a DSS1 station:

```
CHA-COSSU:TYPE=COS,COS=6,AVCE=UUS1IM;
```

Configuration of UUS3 for DSS1:

The calling party must have the classmark for UUS3.

```
CHA-COSSU:TYPE=COS,COS=6,AVCE=UUS3;
```

Changes in the option table

> **IMPORTANT:** Changes in the option table affect all terminals assigned to this particular index number (IDX).

The data rate can also be administrated in option table 10:

- the burst parameter: maximum number of data blocks which can be transmitted within 10 seconds

```
CHA-ZAND:TYPE=OPTTBL,IDX=10, BYTE=42,
VALUEOPT=10;
```

- the incrementation parameter: every 10 seconds an internal counter which controls the data rate is increased by the value assigned to this parameter, until the counter is equal to the burst parameter.

```
CHA-ZAND:TYPE=OPTTBL,IDX=10, BYTE=43,
VALUEOPT=08;
```

Bit 2 of byte 2 in option table 10 may not be set in the option table for DSS1 terminals. Bit 2 specifies whether the service will be activated protocol compliant or proprietary for CMI and network-wide CHESE.

```
CHA-ZAND:TYPE=OPTTBL,IDX=10, BYTE=2,
VALUEOPT=E1;
```

If a call is redirect, the User-to-User service request:

- can always be redirected (only DSS1 terminals)
  `CHA-ZAND:TYPE=ALLDATA2, UUS=DIV;`
- can not be redirected
  `CHA-ZAND:TYPE=ALLDATA2, UUS=NODIV;`
- can only be redirected if the redirecting party has the required UUS classmark.
  `CHA-ZAND:TYPE=ALLDATA2, UUS=DIVSUB;`

10.60.3.2 AMO batch for CMI and network-wide CHESE

CMI and network-wide CHESE may only use option table 6. Bit 2 in byte 2 must be activated in this table.

```
CHA-ZAND:TYPE=OPTTBL,IDX=6, BYTE=2,VALUEOPT=E5;
```

Functional terminals used for the expansion connection must have COS UUS1IM:

```
CHA-COSSU:TYPE=COS,COS=x,AVCE=UUS1IM;
```

The default data rate is 64 messages/10sec. maximum. In load cases, this parameter can be administrated using optional table 6, bytes 42, 43.

10.60.3.3 AMO batch for networks

10.60.3.3.1 Configuration of UUS1 Implicit:

If the EDSS1NET and EDSS1NETR protocols are used, a UUS1 request is only accepted if the COT parameter UUS1 is set.

Provided, the COT number 37 is configured for the corresponding trunk:
`CHA-COT:37,COTADD,UUS1;`

10.60.3.3.2 Configuration of UUS1 Explicit:

To transparently transmit an UUS1e request through the network the COT parameter **US1E** must be set. If not, the request is rejected according to the protocol.

Provided, the COT number 37 is set for the corresponding trunk:
`CHA-COT:37,COTADD,US1E;`

10.60.3.3.3 Configuration of UUS3:

AMO-COT:

A UUS3 request is only accepted if the COT parameter UUS3 is set. If not, the request is rejected according to protocol.

Provided, the COT number 37 is set for the corresponding trunk:
`CHA-COT:37,COTADD,UUS3;`

The COT parameter ETSC can be used to define a virtual network limitation for proprietary UU messages (e.g. CMI, NW-CHESE, ...). Where the COT parameter ETSC is set, only UU information requested according to the ETSI protocol is transmitted .

```
CHA-COT:37,COTADD,ETSC;
```

The service UUS3 can only be activated by the calling party (A station). If the COT parameter USBT is set, UUS3 can also be activated (network option) by the called party (B station).

```
CHA-COT:37,COTADD,USBT;
```

With UUS3, a station can transmit a limited data quantity transparently to the call partner. If the predefined data quantity is exceeded by one of the two parties and if the COT parameter USCC is set, the transmitting party receives a Congestion Control message. It informs the sending party that no further UU information will be accepted or transmitted. After a timeout (network option) the limited transmission of UU information is allowed again. This information is also signalled with a Congestion Control message.

If the COT parameter USCC is not set, the check of the data quantity as described above is prevented and an unlimited quantity of UU information can be transmitted (important for proprietary features such as CMI, NW CHESE, ...).

```
CHA-COT:37,COTADD,USCC;
```

If the COT parameter USCD is set, a UUS request is not forwarded to the forwarding destination.

```
CHA-COT:37,COTADD,USCD;
```

AMO TDCSU:

A defined maximum number of UU information messages (UUSCCX) per time unit (UUS3T2) is available for each station with the UUS3 classmark. Regardless of whether or not the stock was used, the remaining stock is increased by a defined quantity (UUSCCY) after a certain time interval (UUS3T2), until the original maximum number (UUSCCX) is reached. In this way, the user is provided with a clearly defined bandwidth..

Provided, the corresponding trunk is a digital trunk with S2 interface (S2COD) in slot 1-2-115-1 and B channel group 1 has been configured (default value UUSCCX=16, UUSCCY=8):

```
CHA-TDCSU: DEV=S2COD, PEN=1-2-115-1, BCGR=1, UUSCCX=10;

CHA-TDCSU: DEV=S2COD, PEN=1-2-115-1, BCGR=1, UUSCCY= 5;
```

AMO CTIME:

The timer UUS3T1 defines the maximum waiting time of the network side for an answer to a sent UUS request. If the timer expires before an answer is received, the service is released according to protocol.

```
CHA-CTIME:TYPESWU=CPTIME,UUS3T1=10;
```

The timer UUS3T3 defines the maximum waiting time of the user side for an answer to a sent UUS request. If the timer expires before an answer is received, the service is released according to protocol.

```
CHA-CTIME:TYPESWU=CPTIME,UUS3T3=10;
```

Every station with UUS3 classmark is assigned a certain maximum number of UU information messages per time unit which is defined by the timer UUS3T2.

```
CHA-CTIME:TYPESWU=CPTIME,UUS3T2=10;
```

10.60.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
COSSU	UUS1IM	d	User-to-user 1 implizit
	UUS1IM	e	User-to-user 1 implicit
COT	ETSC	d	Nur ETSI UUS3 protokollkonforme Meldungen werden zugelassen
	ETSC	e	Only messages in compliance with ETSI UUS3 protocol are allowed
	UUS1	d	User-to-user implizit (kommend)
	UUS1	e	User-to-user implicit (incoming)
	USBT	d	B-TLN kann bei Bedarf auch UUS3 Service anfordern.
	USBT	e	If necessary, the B station can request UUS3 service
	US1E	d	User-to-user explizit (kommend)
	US1E	e	User-to-user explicit (incoming)
	UUS3	d	User-to-user 3 (kommend)
	UUS3	e	User-to-user 3 (incoming)
	UUSC	d	UUS3 Begrenzung der Datenmenge
	UUSC	e	UUS3 limitation of the data quantity
	USCD	d	Bei AUL wird die UUS3 nicht umgeleitet (kommend)
	USCD	e	With FWD, UUS3 is not forwarded (incoming)
CTIME	UUS3T1	d	Maximale Wartezeit auf eine Antwort(Netzwerkseite)
	UUS3T1	e	Maximum waiting time for an answer (network side)
	UUS3T2	d	Zeiteinheit für maximale Meldungen pro Zeiteinheit
	UUS3T2	e	Time unit for maximum messages per time unit
	UUS3T3	d	Maximale Wartezeit auf eine Antwort(Userseite)

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	UUS3T3	e	Maximum waiting time for an answer (user side)
TDCSU	UUSCCX	d	Max. Anzahl Meldungen pro Zeiteinheit (UU3T2)
	UUSCCX	e	Maximum number of messages per time unit (UUS3T2)
TDCSU	UUSCCY	d	Anzahl von Meldungen, die pro Zeiteinheit (UU3T2) bis zum Maximum (UUSCCX) aufgestockt wird.
	UUSCCY	e	Number of messages which is increased per time unit (UU3T2) up to the maximum (UUSCCX)
ZAND	UUS	d	DIV UUS Umlenkung erlaubt NODIV Umlenkung verboten DIVSUP Umlenkung abhängig von der Berechtigung
	UUS	e	DIV UUS forwarding allowed NODIV forwarding not allowed DIVSUP forwarding dependent on the COS

10.61 Variable Call Forwarding No Reply

10.61.1 Feature Description

Up to now it was only possible to define the ring time system wide. Now it is possible to set the ring time station-specific.

10.61.2 Service Information

This feature is supported with the following devices:

- optiPoint
- OpenStage
- Anates
- CP400/CP600 phones

10.61.3 Generation (Example)

```
ADD-ACTDA:TYPE=STN,STNO=37278,FEATCD=VARRING,
```

```
RNGTIME=10;
```

The ring time in seconds can also set via the service menu (not valid fro Anate) at the device itself:

Service Menue > Destinations > Call Forwarding > FWD-VAR-RNA-BOTH > Ringing duration until forwarding

Enter the number of seconds and safe your new settings.

10.61.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
ACTDA	LMACT=VARRING	d	Aktiviert das Leistzungsmerkmal für ein bestimmtes Endgerät
	FEATCD=VARRING	e	Activates the feature for a specific device
	RNGTIME	d	Rufdauer in Sekunden mögliche Werte: 1-60
	RNGTIME	e	Ring time in seconds possible values: 1-60

10.62 Witness Facility

10.62.1 Feature Description

Digital telephones offer the possibility of setting up a network-wide "witness" connection during internal or external calls. The prerequisite for activating a witness connection is that the user activating the facility is called directly. This means it is not possible to activate the witness facility for a consultation call. The witness is connected without a notification tone. The ITR group's witness (analog telephone) can be dialed automatically by pressing the witness key. ITR groups should be used to ensure that users have set a permitted ITR as the witness facility. One witness station can be added per ITR group.

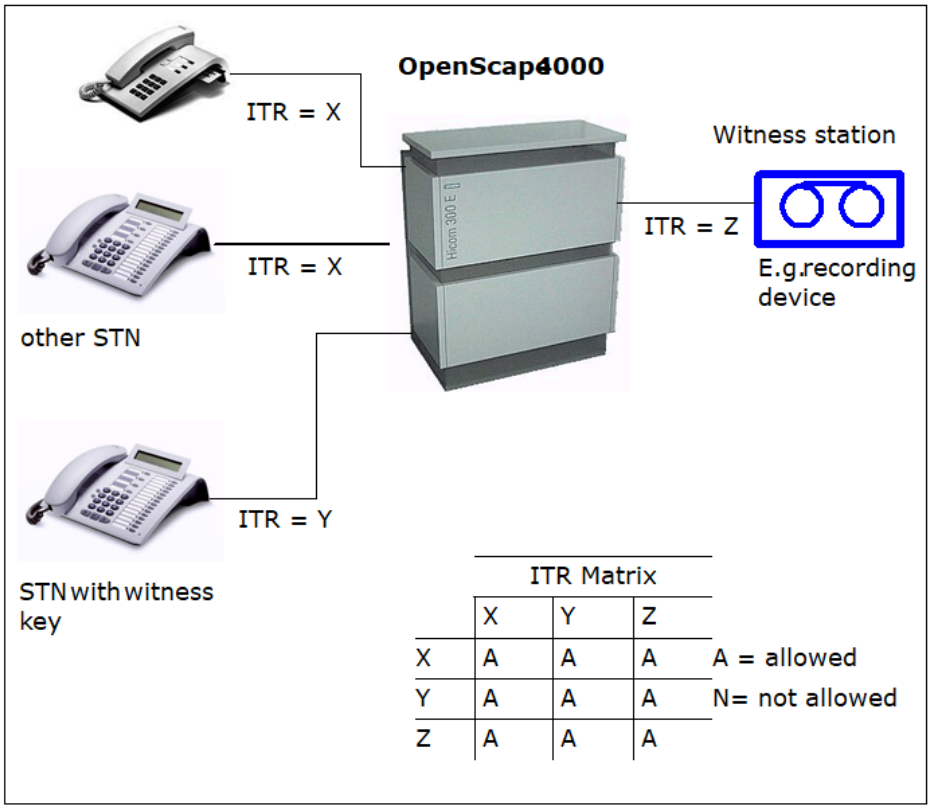


Figure 117: Traffic relations for witness facility

10.62.2 Service Information

- One witness station can be added per ITR group.
- The witness facility key can only be assigned with the AMO TAPRO.
- The "witness" can only be an analog telephone.

> **IMPORTANT:** The witness station must at least have restricted trunk access. The call forwarding on no answer feature must not be activated for the witness facility.

10.62.3 Generation (Example)

- Set up the ITR matrix (if not yet available) with:

```
CHA-VBZ:ITRSRC=<number>,ITRGR=<TYPE>,
ITRDEST=<number_itr>;
```

- Set up a digital station if not yet available:

```
ADD-SBCSU:STNO=<number_addon>,OPT=OPTI,CONN=DIR,
DVCFIG=OPTISET,COS1=<number>,COS2=<number>,
LCOSV1=<number>,LCOSV2=<number>,
LCOSD1=<number>,LCOSD2=<number>,
ITR=<number_itr>;
```

- Assign the witness facility key (for example, key 12) for a station with:

  ```
  CHANGE-TAPRO:STNO=<number_addon>,KY12=ADDON;
  ```
- Restrict the witness station to the CPS "consultation call" with:

  ```
  ADD-WABE:CD=<number_witns>,CPS=8&9,
  DAR=STN;
  ```
- Configure an analog witness station with:

  ```
  ADD-SCSU:STNO=<number_witns>,DVCFIG=ANATE,
  ITR=<number_itr>,COS1=<number>,
  COS2=<number>,LCOSV1=<number>,
  LCOSV2=<number>,LCOSD1=<number>,
  LCOSD2=<number>,SPEC=WITNS;
  ```
- Assign a witness station to an ITRGR as follows:

  ```
  ADD-VBZGR:GROUP=<number_itr>,TYPE=LSTNR,
  STNO=<number_lstnr>;
  ```

10.62.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
SCSU	TLNNU	d	TEILNEHMER-RUFNUMMER
	STNO	e	STATION NUMBER
	GERKON	d	GERAETE-KONSTELLATION EINES TEILNEHMERS ANATE = ANALOGES SPRACHGERAET
	DVCFIG	e	DEVICE CONFIGURATION ANATE = ANALOG VOICE TERMINAL
	SOND	d	SONDEREINRICHTUNGEN BEIM TEILNEHMER ZEUGE = TEILNEHMER MIT ZEUGENANSCHLUSS
	SPEC	e	SPECIAL FACILITY AT STATION WITNS = STN/PORT FOR CONNECT. OF TAPEREC. ETC. AS WITNESS
	VBZ	d	VERKEHRSBEZIEHUNGSGRUPPE
	ITR	e	INTERNAL TRAFFIC RESTRICTION GROUP
TAPRO	TLNNU	d	TEILNEHMERRUFNUMMER
	STNO	e	STATION NUMBER

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	TDxx	d	TASTENFUNKTION TASTE xx z.B. xx = 12
	KYxx	e	KEY FUNCTION FOR BUTTON xx e.g. xx = 12
WABE	RNR	d	Rufnummer
	CD	e	access code / station number
	VKS	d	VERKEHRSSITUATION
	CPS	e	CALL PROGRESS STATE
	KZP	d	KENNZAHLPUNKT TLN = Teilnehmer
	DAR	e	DIGIT ANALYSIS RESULT STN = STATION
VBZ	VBZUR	d	VERKEHRSBEZIEHUNGS-GRUPPE URSPRUNG
	ITRSCR	e	INTERNAL TRAFFIC RESTRICTION GROUP, SOURCE
	VBZG	d	VERKEHRSBEZIEHUNG
	ITRGR	e	INTERNAL TRAFFIC RESTRICTION GROUP
	VBZZL	d	VERKEHRSBEZIEHUNGS-GRUPPE ZIEL
	ITRDEST	e	INTERNAL TRAFFIC RESTRICTION GROUP, DESTINATION
VBZGR	GROUP	d	VERKEHRSBEZIEHUNGS/WABE-GRUPPENNUMMER
	GROUP	e	INTERNAL TRAFFIC RESTRICTION OR DIAL PLAN GROUP
	TLNNU	d	RUFNIUMMER
	STNO	e	STATION NUMBER
	TYP	d	EINTRAGSTYP, VERZWEIGUNGSPARAMETER ZEUGE = ZEUGE
	TYPE	e	DESIRED HOTLINE/OFFHOOK RECALL OPTION LSTNR = LISTENER / WITNESS

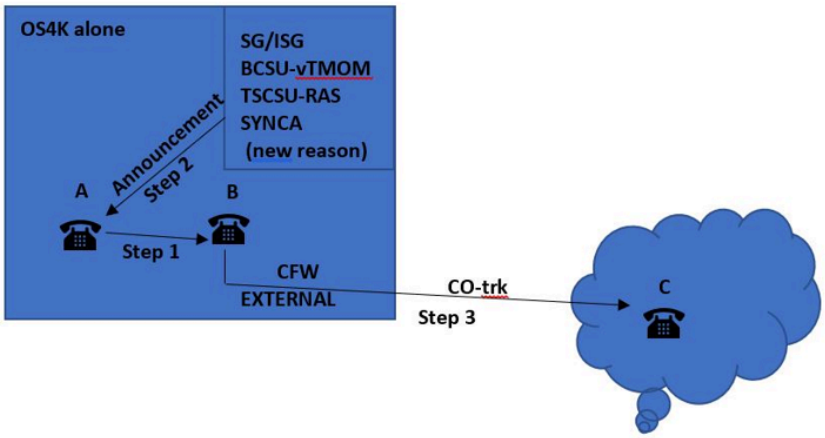
10.63 Announcement for internal caller if the call is forwarded outside of company’s own telephony network

10.63.1 Feature Description

When an internal user A is calling another internal user B who has activated call forwarding to an external number, an announcement can be activated and played to the caller A letting him know the call is about to leave the internal telephony network e.g. *"Your call a is diverted to public network / the destination number is outside of the secured / internal / company network"*

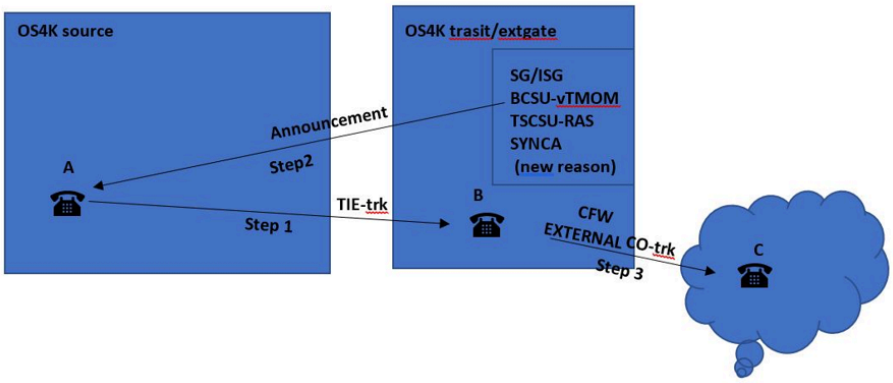
Covered scenarios:

1) **Internal user A can be located in the same node (OS4K) as internal user B.**



- User A calls user B, which has a forward to an external destination.
- At LCR level, the forwarded call is rejected, if the outgoing route is marked in LDAT with a specific flag (`LATTR=FWDOUT`).
- A new connection from user A to the synchronized announcement is build.
- User A hears the announcement.
- After the announcement stops, user A calls the forward destination. This time, the call isn't rejected anymore at LCR level.

2) **Internal user A can be located in a different OS4K node than internal user B (also OS4K). Between the two nodes there is a TIE network link (TDM trunk or IP trunk).**



- User A calls user B, which has a forward to an external destination.
- At LCR level, the forwarded call is rejected, if the outgoing route is marked in LDAT with a specific flag (`LATTR=FWDOUT`).
- A new connection from user A (the incoming TIE trunk in OS4K) to the synchronized announcement is build.
- User A hears the announcement.
- After the announcement stops, user A (incoming TIE trunk in OS4K) calls the forward destination. This time, the call isn't rejected anymore at LCR level.

User Perspective:

The user A will hear an announcement before the call is forwarded to an external destination.

10.63.2 Generation (Example)

Configuration example

- **Add virtual TMOM on Softgate:**
  ```
  ADD-BCSU:MTYPE=PER,LTU=36,SLOT=2,PARTNO="Q2340-X";
  ```
- **Add RAS type circuit on virtual TMOM board for the synchronized announcement:**
  ```
  ADD-BUEND:TGRP=90,NAME="SYNCA",NO=6;
  ADD-COT: 91,ANOD&NTON;
  CHANGE-COT:91,COTADD,,INDEP,"91:SYNCA STA-STO";
  ADD-COP:91,SACK&LSUP,,;
  CHANGE-COP:91,COPADD,,,,INDEP,"91:SYNCA STA-STO";
  ADD-
  TSCSU:PEN=1-36-2-0,COTNO=91,DPLN=0,ITR=0,TGRP=90,CCT="CFW
   OUT",ALARMNO=0,SRCGRP=1,INS=Y,DEV=RAS,COPNO=91,SUPV=SUPV3,ACKT
  ```
- **Synchronized Announcement settings:**
  ```
  ADD-SYNCA:TABTYPE=ANNTT,ANNTYPE=1,ANNAME="CFW
  OUT",ANSTATE=ON,ANREP=1,OPMODE=STASTO, DELAYTM=1;
  ADD-
  SYNCA:TABTYPE=ANNMITR,ANREASON=FWDOUT,ITR=0,ANNTYPE=1;
  ADD-
  SYNCA:TABTYPE=ANNTONE,ANREASON=FWDOUT,PRETONE=LCRET,BACKTONE=RN
  ```

- **The system and the network (trunks) settings for the synchronized announcement:**
  TIE trunk - internal:

```
CHANGE-ZAND:TYPE=ALLDATA2,ANSES=YES;
CHANGE-
COT:COTNO=22,COTTYPE=COTADD,PAR=ABNA&ABPD&IBSY&WAAN;
CHANGE-
COT:COTNO=22,COTTYPE=COTDEL,PAR=KNDI&KNEX&KNTE&TRAI&KNOR;
CHANGE-COSSU:TYPE=COS,COS=33,AVCE=ANSYN;
```

- **CO trunk – external/exit**

  New attribute FWDOUT was defined in LDAT for the outgoing route of the forwarded call:

```
CHANGE-LDAT:LROUTE=1133,LSVC=ALL,LRTEL=1,LATTR=FWDOUT;
```

```
+-------------------------------------------------------------------
+
| LROUTE = 1133  LDPLN        NAME = CO S0
      SERVICE =  ALL
| TYPE = LCR                                  DNNO OF
 ROUTE  = 1 -1  -999    |
| SERVICE INFO =
                    |
+------+-----+-----+----+-----+----------+-----------
+----------+------+----+
|      |     |     |    |     | SCHEDULE |CARRIER    |
         |      |    |
|LRTEL | LVAL|TGRP | ODR|LAUTH| ABCDEFGH |       ZONE|
  LATTR |LDSRT|COTIDX
+------+-----+-----+----+-----+----------+-----------
+----------+------+----+
|     1|    1|  133|  12| 1   | ******** | 1    EMPTY|
  FWDOUT |      |    |
+-------------------------------------------------------------------
+
```

- **In a browser open the WBM of the virtual NCUI of the Softgate. This is located on slot 6:**

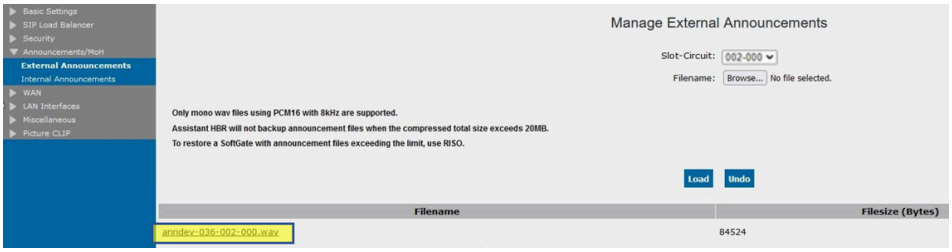
```
LTG  1  LTU 36  SRCGRP 6    ALARMNO-LTU 0
 SOFTGATE1000    488 PORTS USED
-----+----------+--------+---+-+-+---+-+------------
+------------+---------+
     |           |        |   |S|H|AL-|N|            |
          |         |
     | ASSIGNED  | MODULE |FCT|E|W|ARM|P| INSERTED   |
  HW-      | MODULE  |
 PEN | MODULE    | TYPE   |ID |C|Y|NO |R| MODULE     |
STATE INFO  | STATUS  |
-----+----------+--------+---+-+-+---+-+------------
+------------+---------+
   1 | AVAILABLE                    0| | AVAILABLE  |
          |         |
   2 | Q2340-X    vTMOM              0| | Q2340-X    |
 1  -10 -  | READY   |
```

```
   3 | Q2330-X    vHG3500    1        0| | Q2330-X    |
 1  -07 -  | READY   |
     +--------------------------------+-+-----------
+-----------+---------+

   6 | Q2329-X    SoftGate   1        0| | Q2329-X    |
 1  -09 -  | READY   +
      -------------------------------+-+-----------
+-----------+----------
     | IP ADDRESS :  xxx.xxx.xxx.xxx      B-CHANNELS :
 250    BCHLCNT : 250 |
     | IP MODE    :     IPV4              DHCP V4   :
 NO    DHCP V6 :   NO|
     +--------------------------------+-+-----------
+-----------+----------
```

Go to **Announcements/Moh → External Announcements**

Then choose one of the available circuits (ex. circ 000 from slot 002 preassigned by AMO TSCSU).

For this circuit, an audio file must be loaded with the parameters according to the requirements described on the page.



10.63.3 Service information

Restrictions:

- The feature only covers homogeneous OS4K networks (OS4K-OS4K) therefore, in order to have the networking scenario covered, the caller A (from partner switch) needs to "prove" it is part of own customer OS4K network. This means the `ORIG_NET_ID` flag as part of Classmarks of incoming setup NEEDS to be `DB_CP_ONI_OWN_1` (which normally is, in an OS4K homogeneous network). For other values pointing to Public_Network or for lack of any indication (NO_IND), the announcement shall not be played at all to the caller.
- If the special flag in LDAT is configured, but the announcement doesn't work or isn't configured, then the call forward to the external destination will be executed without playing the announcement.
- If the configuration isn't complete, the call forward to the external destination will be executed without playing the announcement.

11 Attendant Console

11.1 Attendant Console

11.1.1 Overview

This document describes the configuration of attendant consoles and associated Attendant groups,

11.1.2 Feature Description

An attendant is given an individual number known as the personal number with the code ATNDIND

Unlike user station terminals and trunk circuits, the Attendants are not yet ready for operation, they invariably have to be assigned to an ATND group (VFGR).

This is done using the VFGR AMO. Since night options are also assigned to every attendant terminal (at least one dummy option if night service is not provided), they have to be created beforehand with the NAVAR AMO.

The following night options can be assigned with the AMO NAVAR:

NONE	Dummy option
STN	Night answer station
GENANS	Universal night answer
CASEXT	External Centralized ATND Service group
CASINT	Internal Centralized ATND Service group

The VFGR AMO is used to allocate all the relevant ATNDs as well as night options to the ATND group to be set up.

A choice of the following type of attendants: AC4, AC-WIN and AC-WIN MQ. is made by the parameter ACTYPE in AMO ACSU.

For a group of AC-WIN MQs the AMO-VFGR has to create an attendant group with QUEMODE=MQ (multiple queue) whereas a group of other attendants (AC4, ACWin-4.x) is created via QUEMODE=DQ (double queue).

AC-WIN MQ attendants cannot be within the same attendant group with other type of attendants.

The night options are given a neutral number created in the NAVAR AMO and allocated in the ATNDGR as night option 1, 2 etc.

Once the ATND group has been defined it is assigned the codes:

- ATNDDID for direct inward dialling (incoming CO (central office) calls to the attendant),
- ATND attendant code, (internal calls to the attendant)
- GENANS, if trunk answer from any station has been implemented

It is necessary to assign the ATNDDID access code and also the ATND access code for every used attendant group (VFGR) via the AMO VFGKZ. The attendant group cannot be reached without the assignment of these access codes (even in case of intercept calls or personal calls to the attendant).

If an ATND group takes over the tasks of another ATNDGR as a night variant, it becomes a "Centralized Attendant Services" group (CASGR). This CASGR can be in the home system (CASINT) or in another node of a network (CASEXT).

An ITR group and/or DPLN group does not need to be specified unless access to the attendant terminal group is to be restricted. This is necessary, for example, if several customers share one system and one ATND group is set up per customer.

If all customers share a common attendant group, up to 1000 ATNDDID access codes can be assigned for incoming CO calls and for each access code a particular company name can be assigned.

This is done via AMO-ZAND, TYPE=ATND, COMP1000=YES and the appropriate AMO VFGKZ assignments for the access codes and the company names.

If the AMO-ZAND value COMP1000 is set to NO then up to 10 ATNDDID code numbers can be added per customer for incoming CO calls and each number (00-09) can be assigned to a particular company name (VBZGR AMO). Before the implementation of up to 1000 company names this limit was 10 company names. The limited option is kept in order to simplify the software upgrade of switches to a higher software release.

ATNDs can be added to, or deleted from, an ATND group any time; one ATND may not belong to more than one ATNDGR at a time. Night ATNDs are not supported anymore.

Special night answer stations (ANATE or DIGITE) can be assigned to several night options. Only one station (ANATE), which is assigned with the SSC AMO, is entered in the GENANS night option.

Before being deleted, day ATNDs, special night answer positions and GENANS positions must be cancelled from any groups to which they are assigned (ATNDGR, night option, hunting groups).

Before an ATNDGR is deleted, any code allocation and integration into the device search must be deleted with the VFGKZ AMO.

The overflow position option, (required when all positions of an ATNDGR are busy), is described in detail in the VFGR AMO Description. The individual attendant terminals can be assigned a name and an organizational unit under their respective call numbers using the PERSI AMO.

IMPORTANT: Attendant consoles cannot be configured in hunting groups. In the case of systems without attendant console an ATND group must still be configured, complete with an assigned night answer station! (No hardware required!)

Up to 16 attendant groups can be configured in one system.

Special access authorizations must be entered for stations assigned as special night answer stations (using the AMO ZAND). When the night switch is active, the authorizations contained in COS1/COS2 of these stations are replaced by the authorizations defined with the AMO ZAND.

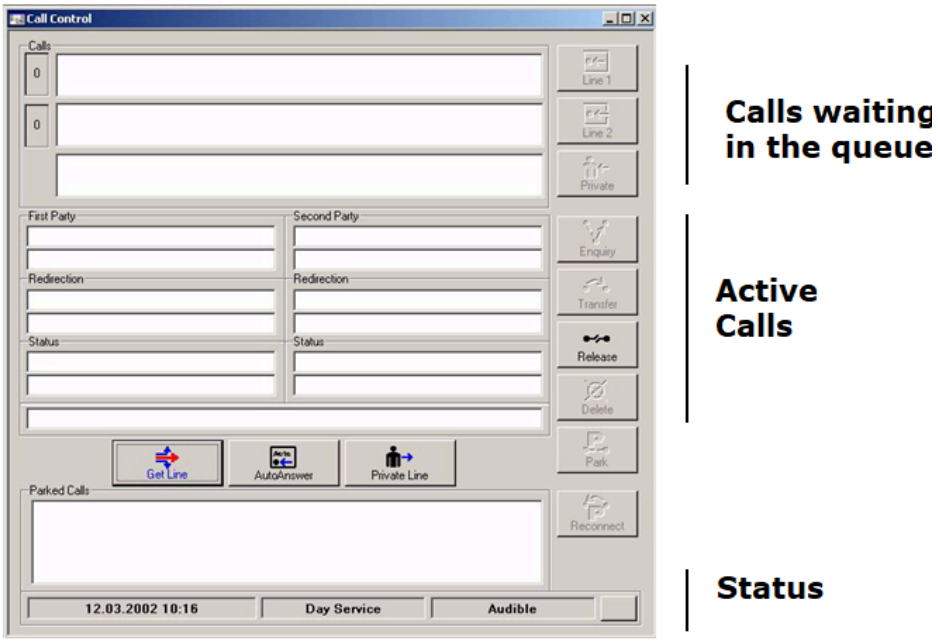
IMPORTANT: The central parameters for the attendant consoles can be found in the TYPE=ATND branch of the ZAND AMO.

11.1.3 Comfort Attendant Console

The features are worldwide released to multiple queue (MQ) and parallel display in addition to the double queue (DQ) for the windows attendant console.

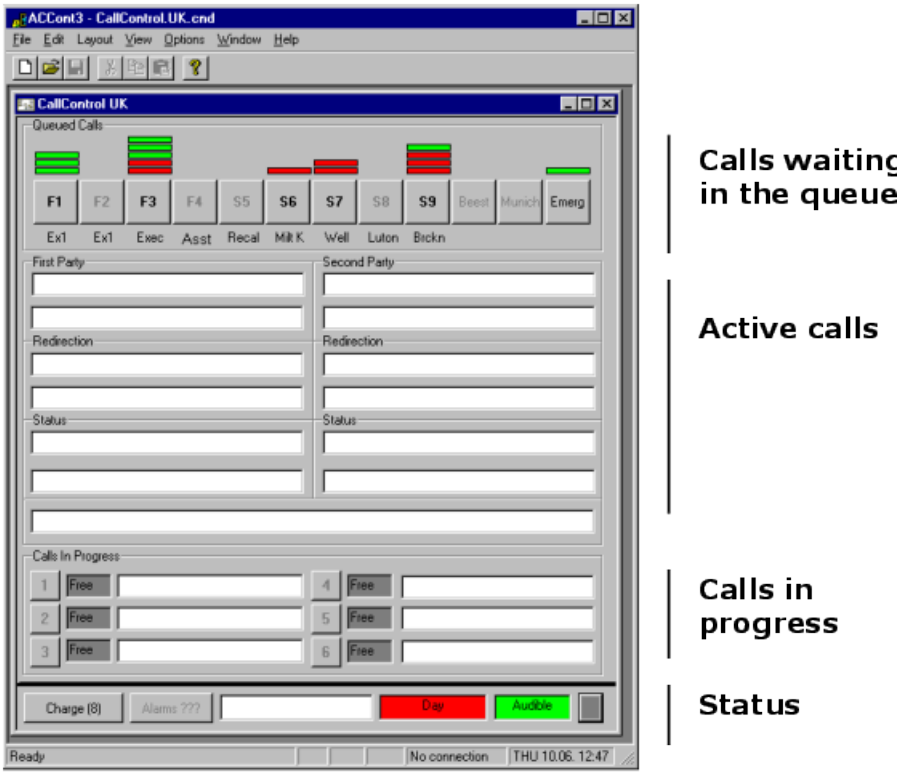
11.1.3.1 Overview AC-WIN (DQ)

The feature "double queue" is the standard for the queue mode of arrangement groups. This mode supports 2 spring queues, which submits incoming calls and is taken to disconnected mode there as administered. All calls incoming with such a AC group are shown to the attendant console according to the configuration.



11.1.3.2 Overview AC-Win MQ

The feature Multiple Queues and Parallel Presentation provides a Queue mode for Attendant Groups. This Queue mode supports 12 Source Queues to which calls are directed and queued according to the administration in AMO BUEND and AMO VFGR. All incoming calls to such an Attendant Group are parallel presented to the Attendants of the group. Directed calls to special Attendants and personal calls are also queued but presented to this special Attendant only. This Queue mode is named MQ (Multiple Queues) and is the alternative to the DQ (Double Queue) mode.



Valid Attendant types in these groups can be:

Attendant Group Queue Mode	Attendant type
DQ (Double Queue)	AC4, AC-Win 4.x
MQ (Multiple Queue)	AC-Win MQ 2.x

The feature can be used network-wide in a homogeneous OpenScape 4000 and mixed OpenScape 4000/HiPath 4000/DX networks.

There are no changes to hardware required for this new feature the Multiple Queue version of the AC-Win utilises the same hardware as the previous ACWin-xx. The feature requires a different software package to be loaded on the PC.

11.1.4 Nodes without an Attendant Console

11.1.4.1 Feature Description

Ensure that an attendant group with a "STN" (station) or an empty variant night switch option is assigned in nodes without ATNDs.

11.1.4.2 Service Information

- This requires no HW (AC)!

11.1.4.3 Generation (Example)

- Assign a "STN" night switch option

  ```
  AD-NAVAR:NOPTNO=number,TYPE=STN,STNO=number;
  ```

  or as an empty variant:
  ```
  AD-NAVAR:NOPTNO=number,TYPE=NONE;
  ```
- Assign a console group with station

  ```
  AD-VFGR:ATNDGR=number,NOPT1=number,
  OPT=number,CQMAXF=number;
  ```

11.1.4.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
NAVAR	NAVARNU	d	NACHTVARIANTENNUMMER
	NOPTNO	e	NUMBER OF NIGHT SWITCHING OPTION
	TYP	d	GERAETETYP DER NACHTVARIANTE
	TYPE	e	NIGHT ANSWER CATEGORY
	TLNNU	d	RUFNUMMER EINER NEBENSTELLE
	STNO	e	TATION NUMBER
VFGR	VFGRU	d	NUMMER DER VF - GRUPPE
	ATNDGR	e	ATTENDANT GROUP NUMBER
	EINGVA	d	IM NACHTSCHALTUNGSFALL ZU AKTIVIERENDE VARIANTE
	OPT	e	NIGHT OPTION ON ACTIVATION OF NIGHT MODE
	NTVAx	d	DER NACHTVARIANTE x ZUGEORDNETE VARIANTE x = 1 ... 8
	NOPTx	e	DEVICE(S) ASSIGNED TO NIGHT OPTION x x = 1 ... 8

11.1.5 Usage - Examples

11.1.5.1 Assign an Attendant (AC)

- Assign attendant telephone number in AMO WABE

  ```
  ADD-WABE=CD=<Individual Attendant Console
  number>,DAR=ATNDIND;
  ```
- Assign a class-of-service in AMO COSSU
  ```
  ADD-COSSU:AVCE=parameter...;
  ```
- Assign attendant console in AMO ACSU

  ```
  ADD-ACSU:ATNDNO=<Individual Attendant Console
  number>,PEN =<port equipment number
  of the attendant : ltg-ltu-slot-cct>,
  DPLN =<feature access group / dial plan>,
  COS =<class of service>,LCOSV =<LCR class
  of service for voice-services of this attendant :
  1...32 (1)>,LANG =<language parameter for
  Attendant : e.g. ENG for english (DE)>,
  ACTYPE =<Attendant Console type parameter :
  ACWIN / AC4>;
  ```

  IMPORTANT: Parameter ACWIN is used for all AC-Win x.x and AC-Win MQ x.x types. Parameter AC4 is used for normal AC types.

11.1.5.2 Assign an Attendant Group (ATNDGR)

- Assign the digit analysis results in AMO WABE
  ```
  ADD-WABE:CD=<Internal Operator group number>,
  DAR=ATND;

  ADD-WABE:CD=<Indial number to Operator group>,
  DAR=ATNDDID;
  ```
- Assign the Attendants in AMO ACSU
- Assign the night options in AMO NAVAR
  ```
  ADD-NAVAR:NOPTNO=<Night Option number>,
  TYPE=<Night option type>,....;
  ```
- Assign the attendant group in AMO VFGR

  For each Attendant group it must be decided in which Queue mode the group shall be operated.

  Attendant groups with Double Queue mode (DQ) can consist of AC4 and AC-Win 4.x Attendant types.
  ```
  ADD-VFGR:ATNDGR=<Atnd.Grp.number>,QUEMODE=DQ,
  ATNDNO=<number>,NOPT1=<Night option number>,
  OPT=<Selected Night Option parameter NOPTx on
  ```

```
activation of Night mode :1...8 >;
```

Attendant groups with Multiple Queues mode (MQ) can consist of AC-Win MQ 2.x Attendant type only.

```
ADD-VFGR:ATNDGR=<Atnd.Grp.number>,QUEMODE=MQ,
ATNDNO=<number>,NOPT1=<Night option number>,
OPT=<Selected Night Option parameter NOPTx on
activation of Night mode :1...8 >;
```

IMPORTANT: The AMO VFGR automatically puts all attendant consoles into operation.

- Assign dialing codes (internal operator group and indial to operator group dialing code) to the new defined Attendant Group

```
ADD-VFGKZ:TYPE=ATNDGR,CD=<key-num>,
ATNDGR=<Attendant Group number>;
```

11.1.5.3 Assign a Name to an ATND Group

In shared systems for each of up to 1000 ATNDDID access codes a company name can be assigned via AMO VFGKZ. This company name appears on the display of the attendant console.

- Assign a name to a console number

```
ADD-VFGKZ:TYPE=NAME,CD=<key-num>,
NAME=<string>;
```

  For attendant intercept, the ITR group of the user station or of the trunk circuit is checked and the name assigned to this ITR group is displayed on the terminal. The customer name is allocated to the ITR group with the VBZGR AMO.
- Assign the same name for attendant intercept

```
AD-VBZGR:GROUP=<number>,TYPE=CUSNAME,
NAME=<string>;
```

IMPORTANT: The stations assigned to the ITR groups can be interrogated with the AMO SCSU/SBCSU.

11.1.5.4 Remove an ATND from an ATNDGR and Delete

- Remove the attendant from the attendant group

```
CHA-VFGR:ATNDGR=<number>,ATNDNO=<number>,
FUNCT=DEL;
```

- Delete the attendant

```
DEL-ACSU:ATNDNO=<number>,DELOPT=ALL;
```

- Delete attendant telephone number from the DPLN (if necessary)

```
DEL-WABE:TYPE=CD,CD=<key-num>,DAR=ATNDIND;
```

11.1.5.5 Change personal number of attendant

- Change the number in the DPLN
  `CHA-WABE:CD=key-num,CDNEW=key-num,DAR=ATNDIND;`
- Change number:
  `CHA-ACSU:ATNDNO=number,NEWNO=number;`

11.1.5.6 Change ATND Internal Access and Answer Codes

- Assign the station number in the DPLN
  `AD-WABE:CD=<key-num>,DAR=<ATNDDID or ATND>;`
- Assign new codes to the ATND group
  `CHA-VFGKZ:TYPE=ATNDGR,CD=<key-num>,ATNDGR=<number>;`
- Delete old codes in the DPLN (if necessary)
  `DEL-WABE:TYPE=CD,CD=<key-num>,DAR=<ATNDDID or ATND>;`

11.1.5.7 Add an ATND to an ATNDGR

Prerequisite: the ATND must be configured.

- Add ATND to ATNDGR

  `CHA-VFGR:ATNDGR=<number>,ATNDNO=<number>, FUNCT=ADD;`

11.1.5.8 Internal Centralized Attendant Services

The internal centralized Attendant servcices group (CASINT) is assigned in the home node. This function enables the entire range of attendant functions of an ATNDGR to be transferred to another ATNDGR. If an attendant group takes on the attendant terminal traffic of another ATNDGR in addition to its own, it functions as a central attendant group. Thus, an ATNDGR which takes over the functions of another ATNDGR within the same node is known as an internal Centralized Attendant Services group (CASINT). The assignment of an ATNDGR is entered as a night option with the AMO NAVAR, which is in turn assigned to another ATNDGR (CASINT). Only one CASINT may be assigned to a night option. Please note that an ATNDGR must be allocated at least one normal night option. A CASINT may also switch over to an internal night option. The CASINT can only be operated as a night variant, even if no ATND is assigned.

- Assign an attendant console
- Assign night options for the CASINT
  `ADD-NAVAR:NOPTNO=<number>,TYPE=CASINT, ATNDGR=<number>;`

IMPORTANT: More than one night option can be assigned to a CASINT as a destination.

- Assign an attendant group to a CASINT night option
  `ADD-VFGR:ATNDGR=number,{NOPT1...NTVA8},`
  `OPT=number,CQMAXF=number;`

11.1.5.9 External Centralized Attendant Services Group

An external centralized attendant services group (**CASEXT**) is located in a 'foreign' node. Several **CASEXT** can be assigned and active within one network or even within the same system. Each ATNDGR is unambiguously accessible for incoming attendant traffic. Access is obtained by dialling the internal telephone number or indirectly via **ATNDGR** or **DPLNGR**.

IMPORTANT: **CASEXT** configuration and functionality was only supported in OpenScape 4000/HiPath 4000 homogenous networks, however it is also possible to use the configuration to a none OpenScape 4000/HiPath 4000 destination. If the required classmarks are not present in the Connect message from the partner, the centralized attendant feature modules will be left and the call treated as a normal one. Any **CASEXT** configuration prior to these versions is not supported as negative side effects will be experienced.

- Assign night options for the **CASEXT**
  `ADD-NAVAR:NOPTNO=number,TYPE=CASEXT,`
  `CD=number;`

  IMPORTANT: The parameter CD must be the internal access code of the destination system. A 22-digit call number can be specified with the "CD" parameter. In open numbering plans, this call number consists of the tie-line access code and the **ATND** access code. In closed numbering plans, the **ATND** access code of the attendant group in the destination system must be entered. This code must lead to a "NETW" digit analysis result (DAR) in the dial plan.

- Assign a night option to an ATNDGR
  `CHANGE-VFGR:ATNDGR=number,{NOPT1...NTVA8},`
  `OPT=number,CQMAXF=number;`

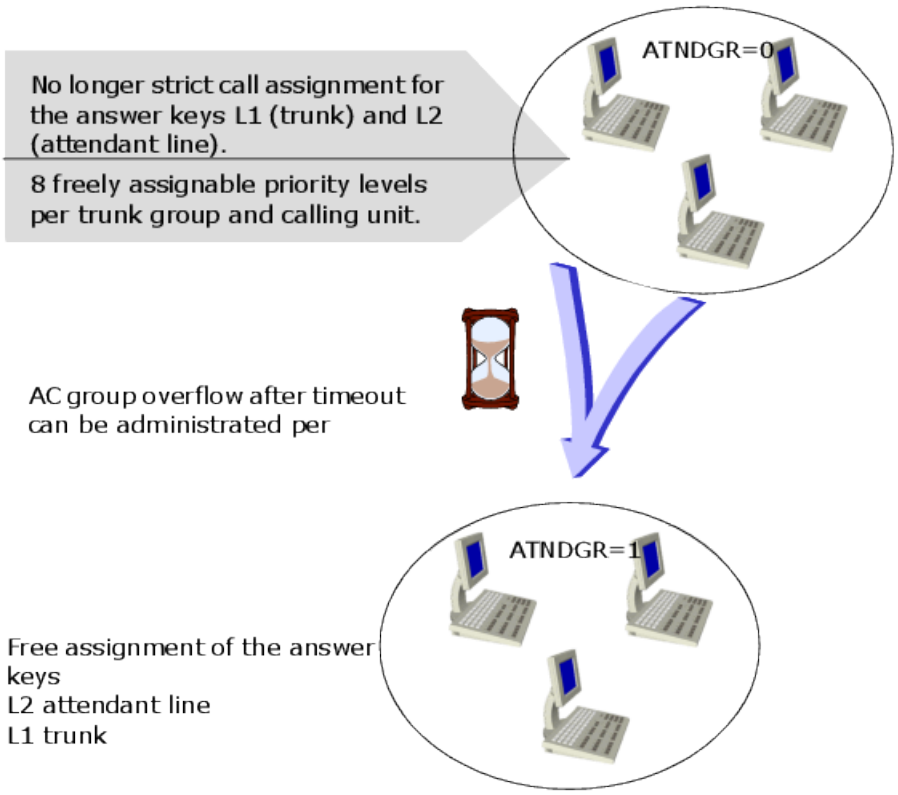
Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
ACSU	GEVFNU	d	geheime vf-nummer (JA,NEIN,NUREXT)
	SATNDNO	e	secret ac number (YES, NO, ONLYEXT)
	KNNR	d	virtuelle Knotennummer
	NNO	e	virtual node identification

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
	SRCGRP	d	source gruppen index
		e	source group index
	CLASSMRK	d	classmarks for ip connection
		e	classmarks for ip connection
	PUBNUM	d	public telephone number
		e	public telephone number
	PUBNAME	d	public telephone name
		e	public telephone name
VFGR	AOMODUS	d	anrufordner modus
	QUEMODE	e	call queuer mode
	AULSTEU	d	steuerung des anrufs bei anrufumleitung beim zielteilnehmer
	COD	e	control of diversion when calling target station
	ENACHTPR	d	prioritaet der einzelnachtschaltung
	INIGHTPR	e	priority of individual night service

11.1.6 Function-Enhancements for the Attendant Queues

The priority assignment to calls in call queues of an AC group is improved.



Enhanced priority control, priority increase and call overflow

The feature is indicated by the following three qualities:

- Incoming calls are bound one and processed in the call queue after new priority criteria.
- At calls in the call queue waiting longer the priority level is increased after time.
- Calls in the call queue waiting longer are diverted (overflow) after time to another manual switching position group.

11.1.6.1 Priority Calculation and Queue Assignment

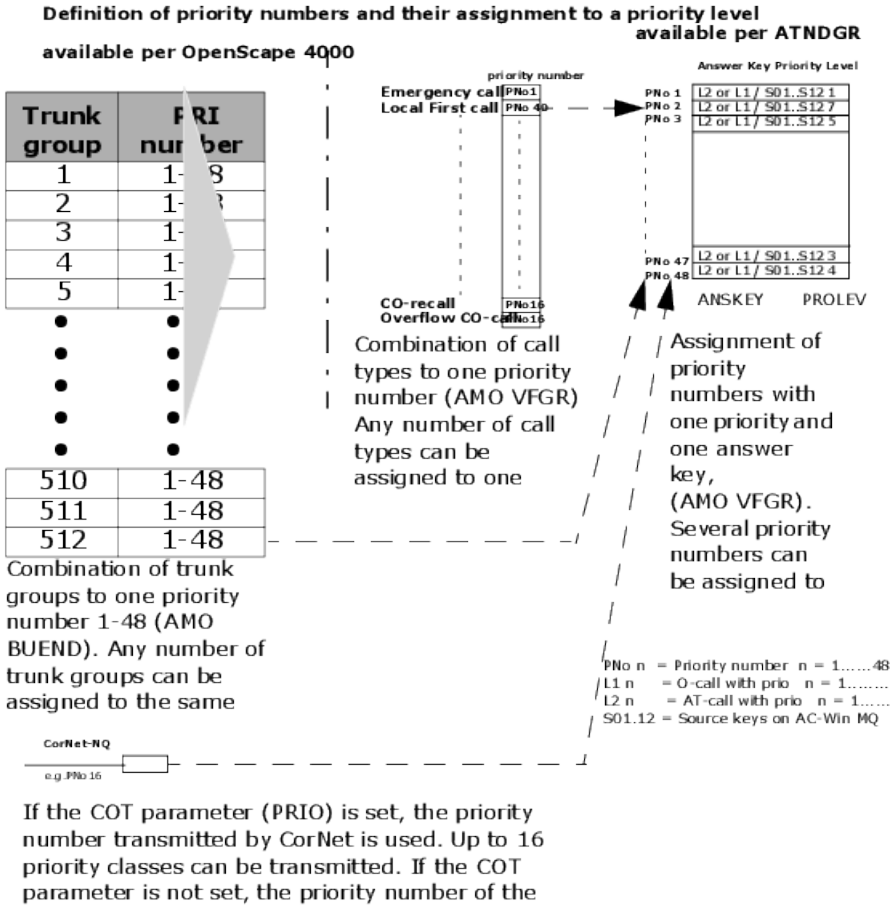
11.1.6.1.1 Feature Description

There is a flexible mechanism to direct incoming calls over different trunks or with different call types to the call answering queues of the Attendant Groups. This mechanism can be used to adapt each customer specific profile for incoming calls to the defined Attendant groups.

For every Attendant group eight priority levels per queue can be configured :

- DQ mode : Priority level 1...8 for answer key L1 and 1...8 for answer key L2,
- MQ mode : Priority level 1...8 for each Source Queue key SQ01...SQ12.

Incoming calls can be freely assigned to an Queue key and a priority level. The highest priority level is 1.



The priority level for incoming calls are assigned in two steps

Incoming calls are assigned to priority numbers (0-48) The priority number of incoming calls can be established in various ways.

- With external first calls (including calls by intercept) according to their origin, i.e. trunk group specific (AMO BUEND). The established priority number is then the same for all AC groups within one PBX.
- With external first calls via transit connections (CASMCF) using CorNet-NQ,the priority number of the originating node can be transmitted (can be administrated in the destination node using COT parameter PRI).
- With transmission via CorNet NQ, they also apply within a system network. Transmitted via CorNet NQ will be the priority numbers 1...16 only. Higher priority numbers (17...48) are mapped to priority number 16. The priority level can then be determined from the priority number. The originating node must be a homogeneous OpenScape 4000/HiPath 4000 network. In transit nodes the priority number is switched transparently through, subject to the COT parameter PRI being set in the transit node for the incoming trunk. With internal calls from an originating node the priority number of the outgoing trunk group is transmitted. The COT parameter PRI is an old parameter (transmission of the priority number via CorNet-NQ in homogeneous OpenScape 4000/HiPath 4000 networks) but changes function with this new usage.
- For all other calls the priority numbers are assigned according to the call type.

Calls with the same priority level within a call queue (answer key) are answered by the Attendants according to the FIFO principle. The longest waiting call is the first transferred to a free station (AC Win or Night station).

11.1.6.1.2 Service Information

- A priority order for the calls can be defined per AC group.
- The incoming calls can be freely assigned to either answer key L1 or L2. The fixed rule that trunk calls are assigned to answer key L1and all other calls are assigned to answer key L2 no longer applies. This allows the assignment of all calls to only one answer key (single distribution).
- Priority numbers of the trunk groups apply to all AC groups within an OpenScape 4000. With transmission via CorNet-NQ, they also apply within a system network.
- The priority number transmission via CorNet-NQ is only supported within a homogeneous OpenScape 4000/HiPath 4000 network (with COT parameter PRI set). In transit nodes the priority number is switched transparently through, provided the COT parameter PRIO is set in the transit node for the incoming trunk. With internal calls from an originating node the priority number of the outgoing trunk group is transmitted.
- The COT parameter PRI is an old parameter the meaning of which has been changed.
  - Transmission of the priority number via CorNet-NQ in homogeneous OpenScape 4000/HiPath 4000 networks.
  - Original meaning: Priority establishment for prioritized trunk groups for calls to the call queue. This meaning is no longer relevant

Following Call Types are supported

Call Type	Definition	Basic Initialization DQ priono	Basic Initialization MQ priono
EMERG	EMERGENCY CALL	3	36
HOT	HOTLINE CALL	3	36
LOFC	LOCAL FIRST CALL	2	46
LOREC	LOCAL RECALL	2	42
LOPRIC	LOCAL PRIO CALL	4	45
COREC	CO RECALL	5	40
COSER	CO SERIAL CALL	5	40
COINCO	CO IN CONSULTATION	5	43
COONHOOK	CO ON HOOK IN CON-SULTATION	5	43
TIREC	TIE RECALL	2	41
TISERTT	TIE SERIAL CALL	2	41

Call Type	Definition	Basic Initialization DQ priono	Basic Initialization MQ priono
TIINCO	TIE IN CONSULTATION	2	44
TIONHOOK	TIE ON HOOK IN CON- SULTATION	2	44
OVLOFC	OVERFLOW LOCAL FIRST CALL	2	39
OVLOPRIC	OVERFLOW LOCAL PRIO CALL	2	38
OVCOFC	OVERFLOW CO FIRST CALL	5	37
OVTIFC	OVERFLOW TIE FIRST CALL	2	38
PERSONAL	PERSONAL CALL	--	48
ACLOOP	ATND. LOOP TRANSFER	--	47

The following tables show the standard initialisation values for the various call types and their priority levels

DOUBLE QUEUE (DQ)

Table 65: Table 1-1 Basic initialisation DQ

Priority Number PRIONO	ANSKEY	PRIOLEV
1(CO first call-AMO BUEND)	L1	3
2 (int &ext calls init AMO-BUEND	L2	3
3	L2	1
4	L2	2
5	L1	2
6-8	L2	8
11-48	L2	8

Multiple Queues (MQ)

Table 66: Table 1-2 Basic Initialsation MQ

Priority Number PRIONO	ANSKEY	PRIOLEV
1	SQ01	3
2	SQ02	3
3-8	SQ012	8
11-35	SQ012	8
36	SQ07	1
37	SQ07	3
38	SQ07	5
39	SQ07	7
40	SQ08	3
41	SQ08	5
42	SQ08	7
43	SQ09	3
44	SQ09	5
45	SQ10	3
46	SQ10	5
47	SQ11	3
48	SQ11	8

11.1.6.1.3 Generation (Example)

1) For trunk calls from a certain trunk group assign the priority level 1 on the answer key L1 for ATNDGR 0 and priority level 4 on the answer key L2 for ATNDGR 1.

- Search for an existing priority number with the priority level of a different trunk group. Enter this priority number for the CO trunk group. In this example there is no such priority number. A free priority number is used. The new priority number (e.g. PNo.8) is entered in the trunk group of the incoming trunk (e.g. TG No. =201):

  ```
  CHA-BUEND:TGRP=201,PRIONO=8;
  ```

- Assign the priority level 1 on answer key T to the priority number 8 for ATNDGR 0:

  ```
  CHA-VFGR:ATNDGR=0,TYPE=PRIOLEV,PRIONO=8,
  ANSKEY=L1,PRIOLEV=1;
  ```

- Assign the priority level 4 on answer key O to the priority number 8 for ATNDGR 1:

```
CHA-VFGR:ATNDGR=1,TYPE=PRIOLEV,PRIONO=8,
ANSKEY=L2,PRIOLEV=4;
```

2) for local first calls, assign the priority level 8 on answer key L1 for ATNDGR 0 and the priority level 4 on answer key L2 for ATNDGR 1.

- There is no corresponding priority level for ATNDGR 0. Assign a new, unused priority number for this ATNDGR (e.g. PNo. 9).

```
CHA-VFGR:ATNDGR=0,TYPE=PRIOCALL,LOFC=9;
```

- Assign the priority level 8 on answer key L1 to the priority number 9 for ATNDGR 0:

```
CHA-VFGR:ATNDGR=0,TYPE=PRIOLEV,PRIONO=9,
ANSKEY=L1,PRIOLEV=8;
```

- The priority level 4 on answer key L2 has already been assigned for ATNDGR 1 (first example). Enter the corresponding priority number 8 for the call type:

```
CHA-VFGR:ATNDGR=1,TYPE=PRIOCALL,LOFC=8;
```

3) Assign the priority level 6 on answer key L1 for recalls (trunk, tie and internal) to ATNDGR0.

- There is no corresponding priority level for ATNDGR 0. Assign a new priority number (e.g. PNo. 10).

```
CHA-VFGR:ATNDGR=0,TYPE=PRIOCALL,LOREC=10,
COREC=10,TIREC=10;
```

- Assign the priority level 8 on answer key T to the priority number 10 for ATNDGR 0:

```
CHA-VFGR:ATNDGR=0,TYPE=PRIOLEV,PRIONO=10,
ANSKEY=L1,PRIOLEV=6;
```

4) For trunk calls from a certain trunk group in an originating node assign the priority level 2 on answer key L1 for ATNDGR 1 in the destination node (only possible in homogenous OpenScape 4000/HiPath 4000 networks via CorNet-NQ)

- Enter a free priority number, unassigned in the system network, (e.g. PNo. 11) in the trunk group of the originating node as described under 1).
- Set the COT parameter PRIO (e.g. COT No. 20) for the incoming CorNet-NQ trunk in the destination node:

```
CHA-COT:COTNO=20,COTTYPE=COTADD,PAR=PRIO;
```

- Assign the priority level 2 on answer key T to the priority number 11 for ATNDGR 1.

```
CHA-VFGR:ATNDGR=1,TYPE=PRIOLEV,PRIONO=11,
ANSKEY=L1,PRIOLEV=2;
```

5) For internal calls in an originating node assign the priority level 7 on answer key L2 for ATNDGR 1 in the destination node (only possible in homogeneous OpenScape 4000/HiPath 4000 networks via CorNet-NQ)

- Enter a free priority number (e.g. PNo. 12) at the outgoing trunk group (e.g. BNo. 21) of the originating node.

  ```
  CHA-BUEND:TGRP=21,PRIONO=12;
  ```

- Set the COT parameter PRIO (e.g. COT no. 20) for the incoming CorNet-NQ trunk:

  ```
  CHA-COT:COTNO=20,COTTYPE=COTADD,
  PAR=PRIO;
  ```

- Assign the priority level 7 on answer key O for ATNDGR 1.

  ```
  CHA-VFGR:ATNDGR=1,TYPE=PRIOLEV,
  PRIONO=12,ANSKEY=O,PRIOLEV=7;
  ```

6) Activate the priority increase and change the timer to 30 seconds

- Activate the priority increase using AMO FEASU

  ```
  CHA-FEASU:TYPE=A,LM=INCPRIO;
  ```

- Change the priority timer

  ```
  CHA-CTIME:TYPESWU=ATNDTIME,CQPRIO=30;
  ```

7) Direct the overflow of ATNDGR 0 to ATNDGR 1. Change the overflow timer to 40 seconds.

- Activate the overflow by entering an overflow ATNDGR using AMO VFGR

  ```
  CHA-VFGR:ATNDGR=0,TYPE=GENERAL,OFLGR=1;
  ```

  The parameter "OFLGR=*" deactivates the overflow for this ATNDGR.

- Change the overflow timer

  ```
  CHA-CTIME:TYPESWU=ATNDTIME,CQOFL=40;
  ```

11.1.6.1.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
BUEND	PRIONUM	d	Prioritätsnummer 1-16
	PRIONO	e	Priority number 1-16
COT	PRIO	d	Priorität von der Unteranlage übernehmen für den kommenden Anruf. Achtung: neue Bedeutung in der E V3.0
	PRI	e	Accept priority from the satellite PBX for the incoming call.Attention: new meaning in EV3.0

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
VFGR	PRIOCALL	d	Verzweigungsparameter (Typ=PRIOCALL)
	ARUEAMT		Auflegen in Rückfrage - Amt
	ARUEQUE		Auflegen in Rückfrage - Quer
	EAINT		Erstanruf intern
	EABVT		Erstanruf bevorzugte TLN intern
	EINTRAMT		Eintreteaufforderung Amt
	EINTRQUE		Eintreteaufforderung Quer
	KETAMT		Kettenanruf Amt
	KETQUE		Kettenanruf Quer
	NOTRUF		Notruf /* Vorleistung*/
	ROE		Röcheln
	UEBVT		Überlauf intern - bevorzugte tln
	UEEAAMT		Überlauf Erstanruf - amt
	UEEAI		Überlauf erstanruf - intern
	UEEAQUE		Überlauf Erstanruf - quer
	WAAMT		Wiederanruf amt
	WAINT		Wiederanruf intern
	WAQUE		Wiederanruf quer

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
	PRIOCALL	e	Branch: priority numbers of call types
	COONHOOK		co on hook in consultation
	TIONHOOK		tie on hook in consultation
	LOFC		local first call
	LOPRIC		local prio call
	COINCO		co in consultation
	TIINCO		tie in consultation
	COSER		co serial call
	TISERTT		tie serial call
	HOT		hotline call
	EMERG		emergency calling /* Vorleistung */
	OVLOPRIC		overflow local prio call
	OVCOFC		overflow co first call
	OVLOFC		overflow local first call
	OVTIFC		overflow tie first call
	COREC		co recall
	LOREC		local recall
	TIREC		tie recall
	PRIOLEV	d	Verzweigung (TYP=PRIOLEV)
	AO		Abfrageorgan
	PRIONUM		Prioritätsnummer
	PRIOLEV		Priority Level
	PRIOLEV	e	Branch:
	ANSKEY		Answer key
	PRINO PRIOLEV		priority number
			priority level
	UELGR	d	Überlaufgruppe
	OFLGR	e	overflow attendant group

11.1.6.2 Priority Upgrade

11.1.6.2.1 Feature Description

Calls waiting longer are diverted after time to another Attendant group. This behavior is administerable. Every Attendant group (VFGR) has an overflow aim

of its own. The overflow is active then if another Attendant group than overflow aim is registered.

The priority level of calls with a low priority level is increased to the highest priority level (priority level 2) after timeout. Priority level 1 is reserved for Emergency calls only and can not be reached by Priority Upgrade.

11.1.6.2.2 Service Information

- Overflow after timeout is not executed for directed calls to an Attendant (serial call, re-call, personal call etc.). Exception: this Attendant is pre-blocked or is unplugged.
- The priority level is newly calculated at the overflow Attendant. For the internal and external first calls (incl. intercept), as well as for priorized stations, the priority numbers of the configured overflow call types apply.
- Every Attendant group has its own overflow destination.
- The overflow is active if an AC group has been specified as overflow destination.
- The over–running time is centrally adjustable.

11.1.6.2.3 Generation (Example)

- Priority Upgrade is activated using AMO FEASU :
  `CHANGE-FEASU:TYPE=<A>,CM=<CQPRI>;`
- The timer for the priority increase can be set using AMO CTIME :
  `CHANGE-CTIME:TYPESWU=ATND,CQPRIO=<5...240>;`
- Overflow to another Attendant group after timeout. Calls waiting for a longer period of time in the call queue are transferred to another Attendantgroup after timeout. This feature can be administrated using AMO VFGR :
  `CHANGE-VFGR:ATNDGR=<number>,TYPE=GENERAL,`
  `OFLGR=<assigned overflow attendant group>,`
- The overflow timer can be set using AMO CTIME.
  `CHANGE-CTIME:TYPESWU=ATND,CQOFL=<5...240>;`

11.1.6.2.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
CTIME	CQOFL	d	Zeitglied für den Überlauf
	CQOFL	e	Overflow timer
	CQPRIO	d	Zeitglied für die Prioritäterhöhung
	CQPRIO	e	Timer for priority increase
FEASU	ERHPRIO	d	Erhöhen der Priorität nach Zeitablauf
	INCPRIO	e	Increase priority level after timeout
VFGR	UELGR	d	Überlaufgruppe
	OFLGR	e	overflow attendant group

11.1.7 Automatic Night Service

11.1.7.1 Feature Description

For each Attendant group it can be defined if it works with an Automatic night switch,i.e. call forwarding - no answer for each Attendant of the group to Night option NOPT 8 after a timeout. If a call is ringing on the Attendants and the Attendant does not execute any call processing actions or switch settings then the Attendant console will switch to Night mode automatically after time out.

11.1.7.2 Service Information

- This feature works in different ways, dependant on the used group Queue mode :

  Attendant Group with Double Queue mode (DQ):

  If the Attendant is not the last Attendant in the group then the calls are distributed new to the other Attendants of the group in Day Service. Personal calls are released.

  If the Attendant is the last Attendant in the group then all waiting calls are forwarded to the NOPT8 destination. Personal calls are released.

  Attendant Group with Multiple Queues mode (MQ):

  If the Attendant is not the last Attendant in the group then the calls will be pre-sented to the other Attendants of the group in Day Service further. Directed calls to this special Attendant will be changed to parallel presented calls. Personalcalls are released.

  If the Attendant is the last Attendant in the group then all waiting calls are forwarded to the NOPT8 destination. Personal calls are released.
- The AMO ZAND parameter AUTNS has no impact for MQ Attendant groups.
- In both cases the Attendant Console changes to Night Service.

As a refinement of this behavior the Automatic Night Service can be executed for the ringing call only. The ringing call is newly distributed or forwarded to the NOPT8 destination only after time out. The Attendant console remains in Day Service.Therefore administrate the following parameter in addition to the VFGR parameter:

11.1.7.3 Generation (Example)

- Set automatic night option for an attendant group:
  `CHANGE-VFGR:ATNDGR=<number>,TYPE=GENERAL,AUTNS=ON;`
- Change the timer:
  `CHANGE-CTIME:TYPESWU=ATND,ATNDCALL=<10...90 seconds>;`
- Set automatic night option only for incoming calls:
  `CHANGE-ZAND:TYPE=ATND,AUTNS=YES;`

11.1.7.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
CTIME	ATNDCALL	d	Zeitglied für den Attendant Call
	ATNDCALL	e	Timer for Attendant Call
ZAND	AUNA	d	Automatische Nachtschaltung
	AUTNS	e	Automatic night switch
VFGR	AUNA	d	Automatische Nachtschaltung
	AUTNS	e	Automatic night switch

11.1.8 Attendant Intercept

11.1.8.1 Feature Description

Intercept of calls by the attendant terminal is controlled in accordance with ITR groups:

The allocation of the ITR group to the attendant group intercept is entered in a table by the VFGR AMO. An automatic process ensures that each of the groups 0-15 (though not all may have been entered) is assigned one ATNDGR. This is effected automatically by entering this ATNDGR in all ITR groups of the table when the first ATNDGR is set up with the VFGR AMO

Further ATNDGR can now be set up specifying precisely from which ITR group calls should be intercepted by this ATNDGR. The original entries will then be overwritten.

11.1.8.2 Service Information

- If the dialed station number leads to a station in the same system, the dialed station's ITR group is used for selecting the attendant console group to which the call is forwarded.
- If the dialed station number leads to a station in a remote system within a CorNet-N private network, the ITR group depends on the ITRN parameter value of the class-of-trunk (COT) of the calling line:
  - If ITRN ist set, the dialled station's ITR group is used for selecting the attendant console group to which the call is forwarded.
  - If ITRN ist not set, the calling line's ITR group is used for selecting the attendant console group to which the call is forwarded.
- If the dialled station number leads to a station in a non-networked remote system, the calling line's ITR group is always used for selecting the attendant console group to which the call is forwarded.

Hint:

Before an ATNDGR can be deleted, and unless it is the only one in the system, another ATNDGR must be entered with the CHANGE VFGR action as intercept destination. Assign an ATNDGR to an ITRGR as an intercept destination (ITDEST), e,g. 5.

```
AD-VFGR:ATNDGR=number,{NOPT1...NTVA8},
OPT=number,CQMAXF=number,ITDEST=5;
```

11.1.8.3 Generation (Example)

Intercept of incoming external calls (CO-trunk) in case of "non existent" achieved through a dedicated ATNDGR with night option to a analogue announcement device. Used to alleviate traffic to the operator. (see below the primary commands which are necessary to be configured)

```
/* Allow feature intercept */
CHANGE-FEASU:TYPE=A,CM=ICPTDID;

/* Cot with IVAC */
ADD-COT:COTNO=100,PAR=IVAC,
INFO="INTERCEPT";

/* Trunks, with ITR 15 */
CHANGE-TDCSU:PEN=<LTG-LTU-EBT-PORT>,
COTNO=100,ITR=15;

/* SLMA1 for announcement */
ADD-BCSU:MTYPE=PER,LTU=1,SLOT=55,
PARTNO=Q2141-X;

/* Configure station for announcement */
ADD-SCSU:STNO=2100,PEN=1-1-55-0,DVCFIG=ANATE,
DPLN=1,ITR=0,COS1=380,COS2=380,LCOSV1=8,
LCOSV2=7,LCOSD1=1,LCOSD2=1;

SOND=SOTL&NAWA,WAHL=MFV,DHPAR=MFVTLN,
INBETR=JA,GETLNNU=NEIN;

/* Station as night option (e.g.. No. 128) */
ADD-NAVAR:NOPTNO=128,TYPE=STN,STNO=2100;

/* Install ATNDGR with night option for
intercept ITR (15) of trunks  */

ADD-VFGR:ATNDGR=2,NOPT1=128,OPT=1,CQMAXF=3,
ITDEST=15;

/* Activate call queues */
ADD-VFGKZ:TYPE=ATNDGR,CD=98,ATNDGR=2;

ADD-VFGKZ:TYPE=ATNDGR,CD=99,ATNDGR=2;

/* Activate night option for ATNDGR */
```

```
ADD-ACTDA:TYPE=ATNDGR,ATNDGR=2,NOPT=1,
ACT=ACT;

/* Setup Interalia MMU2-62AB */
```

Operating Typ: Ring Start with Loop Current Check . Dipfix-Switch:

- S1 = on \
- S2 = on > Message 1 on all lines
- S3 = on /
- S4 = off \
- S5 = on \
- S6 = off > Ring Start Mode on all lines
- S7 = on /
- S8 = on > separate ansage

11.1.8.4 Relevant AMOs

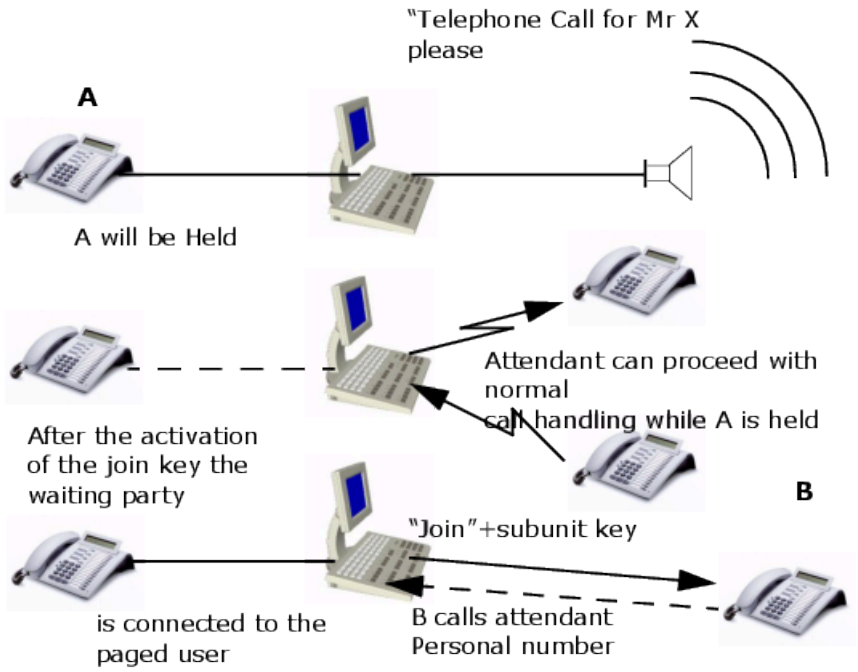
AMO	Parameter	Sprache/ Language	Beschreibung/ Description
NAVAR	NAVARNU	d	NACHTVARIANTENNUMMER
	NOPTNO	e	NUMBER OF NIGHT SWITCHING OPTION
	TYP	d	GERAETETYP DER NACHTVARIANTE
	TYPE	e	NIGHT ANSWER CATEGORY
	RNR	d	PLATZKENNZAHL DER EXTERNEN ZVFGR
	CD	e	CODE FOR EXT. CENTRALIZED ATND SERVICE
	VFGRU	d	VF-GRUPPENNUMMER
	ATNDGR	e	ATND GROUP NO.
	TLNNU	d	RUFNUMMER EINER NEBENSTELLE
	STNO	e	STATION NUMBER
FEASU	LM	d	Leistungsmerkmal
	CM	e	feature, class mark, facility
VFGR	VFGRU	d	NUMMER DER VPL - GRUPPE
	ATNDGR	e	ATTENDANT GROUP NUMBER
	NTVA1	d	NACHTVARIANTE 1 ZUGEORDNETE VARIANTE

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	NOPT1	e	DEVICE(S) ASSIGNED TO NIGHT OPTION 1
	ABWVBZ	d	vbz-gruppen die diese vfgr als Abwurfziel haben
	ITDEST	e	int. traffic groups having atnd group as intercept dest.
	EINGVA	d	im Nachtschaltungsfall zu aktivierende Variante
	OPT	e	night option on activation of night mode
VFGKZ	RNR	d	Kennzahl einer Vermittlungsfernsprechergruppe
	CD	e	attendant console group access code
	VFGRU	d	Vermittlungsfernsprechergruppe
	ATNDGR	e	attendant group number
ACTDA	VFGRU	d	vf-Gruppennummer
	ATNDGR	e	attendant group number
	NAVAR	d	Nachtvariante fuer vf-Gruppe
	NOPT	e	night options for attendant
	ACT	d	Aktivierungsparameter fuer Nachtvariante
	ACT	e	activation parameter for night option

11.1.9 Extend Call to Paged User

11.1.9.1 Overview

The requirement of this feature is to allow the Attendant to connect a caller in a held state with a party in talk state via a new function key JOIN



11.1.9.2 Feature Description

If the attendant is not able to contact the wanted user at their extension. The attendant either places the calling party on hold , or parks the calling party, and pages the wanted user.When the wanted user calls the attendant (Personal key) and the attendant accepts the call, then the attendant is able to join the calling party and the wanted party by pressing the JOIN key and then selecting the held or parked calling party. The call is then automatically released from the attendant as a 2 party call.

11.1.9.3 User Interface

The Extend Call to Paged User feature can be used by the attendant to join a call that is either held at theT,O or R (recall)sub-units or parked, with a paged user who calls into the attendant P sub-unit.(Personal Key) The 2 parties are connected following depression of the JOIN key and then selection of the relevant held or parked party.

This feature is available network-wide.

It is envisaged that this feature will be utilised by the attendant for the following scenarios

After a transferred call to a user has not been answered and the call has recalled to the attendant. The attendant then has the option to page the wanted user

An internal user may not be able to contact a user at their extension and request assistance from the attendant.

The attendant has the option of extending any call received at the P sub-unit(Personal key)to any held or parked call at the other sub-units.(Trunk key ,Attendant key or Parked call).

11.1.9.3.1 Extend Call to Paged User feature invocation from AC

The following description is applicable to:

AC4 on Upoe interface

There are 2 states that the incoming call can be in while the Attendant waits for the response to the paged call, these being held at the T,O or R sub-unit, which is described in case 1 below; or parked which is described in case 2 below.

Case 1 - Held Call

The incoming call is on hold at either the T,O or R sub-unit. A call held at either the T or R sub-unit is interchangeable.

The attendant pages the desired extension and carries on with normal call handling

The returned paged call arrives at the P sub-unit (Personal Key)of the Attendant, and the P sub-unit key will be flashing, the Attendant has an indication on the display of the waiting call against the P in the display, in addition to alerting tone

The Attendant accepts the incoming call by depressing the P key. The associated LED is now lit, and the Attendant display changes to show the calling party number and CONNETED

The Attendant now depresses the JOIN key, the JOIN LED is lit and the Attendant now selects the sub-unit which is to be joined to the call on the P sub-unit (E.G. the T Key), by depressing the T key. The two parties are now joined together and released from the Attendant. The Attendant display returns to normal

Case 2 - Parked Call

The incoming call is parked, the hold led is lit. The returned paged call arrives at the P sub-unit (P Key) of the Attendant, and the P key led will be flashing, the attendant display shows the calling party, the Attendant accepts the call by pressing the P key and the P key led is lit steady. The attendant now presses the JOiN key and the JOIN led is lit and the AC display shows connected. The park key is pressed and the park position which is to be "joined" to the call on the P sub-unit is selected. The 2 partys are connected together and the calls are released from the attendant ,where the display returns to normal.

11.1.9.3.2 Extend Call to Paged User feature invocation from AC-Win

The principle behind the feature invocation for ACWin and ACWinMQ Upoe is the same as that for AC.

The returned paged call to be joined arrives at the P sub-unit of the Attendant. An indication associated with the P sub-unit is shown. The Attendant can join a call received at the P sub-unit to a held call at either the T, O or R sub-units, or a parked call.

The new JOIN key will reside in the AC-Win Buttons window.

The incoming call (returned paged call) will appear in the AC-Win Call Control window.

When the attendant accepts the incoming call, it will be shown as CONNECTED in the AC-WIN Call Control window. The call to be JOINed can be held at either theT, O or R sub-units, or parked.

For held calls, the attendant clicks the JOIN key in the AC-Win Buttons window, or uses the keyboard, and then selects the sub-unit key (where the calling party is held) in the AC-Win Call Control window, both calls are now connected and released from the attendant.

For parked calls, the attendant clicks the JOIN key in the AC-Win Buttons window and then either double clicks to the call in the PARK window, or single clicks to the park position and then presses RECONNECT on the keyboard, the 2 parties are now connected and released from the attendant.

11.1.9.4 Service Information

The feature is an integrated S/W solution.

After the JOIN key has been pressed, only the following keys will appear active to the user:

- JOIN key again to toggle between on/off,
- RELEASE (CLEAR REQUEST) key - to deactivate the JOIN key and release the call on the active subunit.
- NIGHT SERVICE key - to activate/deactivate the blocking of the attendant console for new incoming calls. JOIN remains active
- TAPE RECORDING key - to activate/deactivate tape recording. JOIN remains active
- FUNCTIONAL 1 key - to activate/deactivate the call trace. JOIN remains active,
- HANDSET PLUG OFF for blocking the AC, JOIN will be deactivated
- All Voice Subunit key's (except that active - to execute JOIN)
- After JOIN and PA-Subunit key the attendant can select a park position (0-9) or exit the park menu by pressing the CHECK key.

All other keys will appear none functional to the user.

11.1.10 Remote Activation of Call Forwarding for Users at the Attendant Console

11.1.10.1 Overview

Variable call forwarding (FWD) can be activated or deactivated for any station (forwarding object) in the network at the attendant console (ATND). The call forwarding destination can be any call forwarding destination which the station user would normally be allowed to activate.

To begin with, you must assign the digit analysis results for remote activation (AFWDREM) and remote deactivation (DFWDREM) of call forwarding at the attendant console with the AMO WABE.

In order to enable the remote activation and deactivation feature, you must specify the COT parameter CFOS for both the incoming and outgoing digital tie lines in the path between the ATND and the telephone for which remote FWD activation is to be allowed. The connection path between ATND and forwarding object must be set up with LCR.

11.1.10.2 Service Information

To perform remote FWD, the ATND must have the COS FWDFAS. COSSU AMO is used for the administration of the COS.

The function is for DQ and MQ variants possible.

11.1.10.3 Generation (Example)

- Assign digit analysis results:
  `AD-WABE:CD=<code for AFWDATND>,DAR=AFWDATND, CD2=<code for DFWDATND>;`
- COT parameters for enabling remote FWD:
  `CHA-COT:COTNO=<COT_number>,COTTYPE=COTADD, PAR=CFOS;`
- COT parameters for disabling remote FWD:
  `CHA-COT:COTNO=<COT_number>,COTTYPE=COTDEL, PAR=CFOS;`

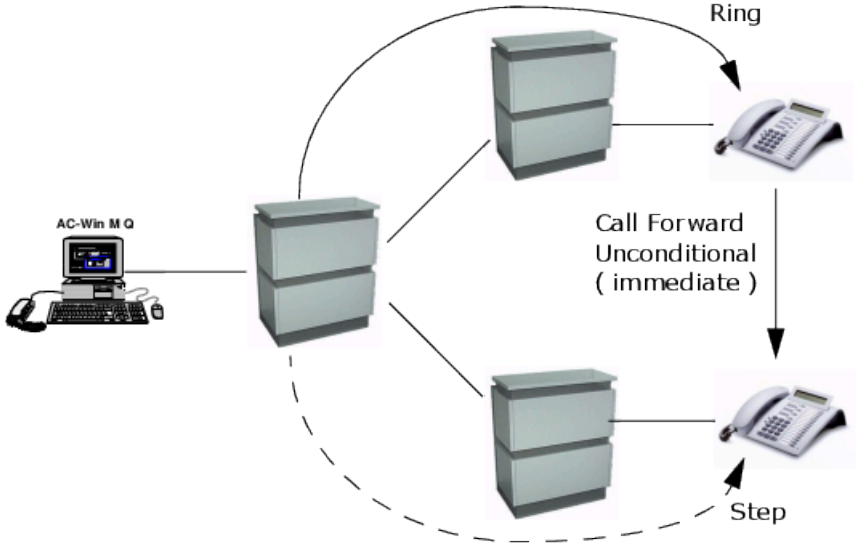
11.1.10.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Discription
COT	COTPAR	d	PARAMETERWERTE FUER EINE COT AUAT = PROGRAMMIERUNG DER ANRUFUMLEITUNG FUER ANDERE TLN MOEGLICH
	PAR	e	PARAMETER VALUES OF A COT CFOS = CALL FORWARDING PROGRAMMING FOR OTHER SUBSCRIBERS
WABE	KZP	d	KENNZAHLPUNKT AULEREM = ANRUFUMLEITUNG EINSCHALTEN REMOTE/FOLLOW ME
	DAR	e	DIGIT ANALYSIS RESULT AFWDREM = ACT CALL FORWARDING REMOTE/FOLLOW ME

11.1.11 Attendant Control of Diversion

11.1.11.1 Overview

The feature 'Control of Diversion' offers the operator (using ACWin MQ) a convenient method to control a diversion (Call Forwarding Unconditional - CFU often referred to as call forwarding immediate CFI)



11.1.11.2 Feature Description

The feature can be enabled or disabled system wide by using settings in AMO ZAND and set into operating mode per attendant group by AMO VFGR. If active for the attendant group the operator , when encountering a diversion, is informed and can choose to follow the diversion or overide it by the use of the buttons STEP or RING. If the feature is enabled in the system but not enabled for the attendant group then the operator has to press the DES key proir to calling a station with call forward immediate set i.e. the STEP and RING keys do not appear automatically and the attendant has know that the station has CFI set.

The feature works on different types of extensions, analog ,digital and functioal devices are supported

11.1.11.3 Service Information

The feature 'Control of Diversion' controls CFB and CFU only, not CFNR (Call ForwardingNo Reply).

If the called extension has ICF (Interactive Call Forwarding) activated, no control of diversion is possible.

If the called extension has a diversion to a call centre activated, no control of diversion is possible.

The feature works network wide with Realitis/DX over CorNet NQ orCorNet NQ/ DPNSS1.

The feature works for transit traffic with CorNet NQ .

For other digital or analogue trunks a control of diversion is not possible. The call follows the diversion.

11.1.11.4 Generation (Example)

- To enable or disable the feature the AMO ZAND is used:
  `CHA-ZAND:TYPE=ATND,COD=<YES/NO>;`

  If the feature is disabled a call always follows an existing diversion. The CoD buttons are without any function. The exception is if a loop subunit is reserved ('In Use' is displayed) and before the first digit is dialed, the reaction for the DES button is that 'NOT POSSIBLE is displayed.
- If the feature in enabled, it can operated in 2 different operation modes, depending on the selection in AMO VFGR :
  `CHA-VFGR:ATNDGR=<nr>,TYPE=GENERAL,COD=ON;`

  With this setting the feature is enabled permanently. For each extension with a diversion (CFU or CFB) a decision to STEP or RING is necessary when it is requested. The DES button is without any function.
  `CHA-VFGR:ATNDGR=<nr>,TYPE=GENERAL,COD=OFF;`

  With this setting the feature is enabled temporary and the operator has to use the DES button to activate the feature for next call before dialing is started. Toggling is possible in this state. The information 'DES ACTIVE' is displayed or removed from the call control window. If the dialed extension has CFU or CFB activated, so the available information about the extension and diversion is displayed and the operator has to decide to follow (STEP button) or override (RING button) the diversion.

11.1.11.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
ZAND	AULSTEU	d	Kontrollierte Anruflenkung in der Anlage aktiviert
	COD	e	Control of diversion enabled for the system
VFGR	AULSTEU	d	Kontrollierte Anrufumlenkung automatisch setzen J/N
	COD	e	Control of diversion set automaticaly Y/N

11.1.12 Displaying of the Source Dialling Number instead of Number of the Attendant Console

11.1.12.1 Feature Description

An incomming call from a public ISDN network that is transfered by the attendant in switch A to an busy extension in switch B provides the source dailing number and not the number of the attendant for the called subscriber and in the call log list.

11.1.12.2 Generation

```
CHA-ZANDE:TYPE=ALLDATA,SCALLOG=YES;
```

11.1.12.3 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
ZANDE	QNRRFLST	d	Quellenrufnummer in Anrufliste
	SCALLOG	e	Source number in call log

11.2 Attendant Light

Attendant Light offers customers (e.g. serving small offices) without central call acceptance for incoming calls the option to receive and speed extend incoming calls using a standard OpenStage 40 HFA or OpenStage 40 TDM phone. This phone also has to support certain attendant features.

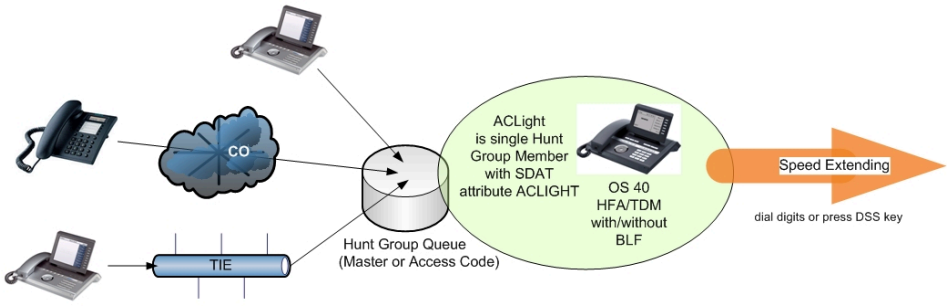


Figure 118: Attendant Light scenario

11.2.1 Service Information

11.2.1.1 General Information

- Released with OpenScape 4000 V7 R1.
- Attendant Light is supported only for OpenStage 40 HFA and OpenStage 40 TDM.

- The Attendant Light device must support the following attendant features:
  - **Multiple incoming call handling**: The existing OpenScape 4000 hunt group solution for queuing and answering calls is used. The Attendant Light device must be single user within a master or code hunt group. Therefore, call distribution options of hunt groups have no impact to Attendant Light because it is a single device in group.

    The Attendant Light can be called via a special Attendant access code which is configured over **DAR=HUNT**/**DAR=STN** in AMO WABE.

    If the Attendant Light is already busy with a call, all next incoming calls are queued. The call with the highest priority in the queue is assigned to the Attendant Light when it becomes available again. The priority order within the queue is emergency call, CO call, tie call, internal call.

    The call queue capacity can be set variable.

    Feature Interactions will be the same as for hunt group (AMO SA).
  - **BLF key module support** with a maximum of 90 direct call keys to observe the status of the programmed subscribers.

    Using the BLF module on the Attendant Light excludes the usage of any other key module.

    Using the Direct station selection keys on the busy lamp field the busy condition of the destination is displayed via a LED. If the destination is called despite being busy, call waiting is activated and the destination is called when no longer busy (only if call waiting is activated. If call waiting is not activated "Not Possible" will be displayed).

    Direct call keys cannot represent network wide parties.
  - **Speed Extend** with dialing a destination number or pressing a direct call key on the busy lamp field module while being in talk state.

    Speed Extending uses the operator if he does not want to announce the call prior to extending it to the destination station.

    In connection state with the partner (caller or called party) the operator dials the destination number of extension B or press DSS key without manually invocation of the consultation function.

    After end of dial, the A party is automatically transferred to the free destination and the Attendant Light device is released.

    Transfer busy is used when extension B is busy (only if call waiting is activated. If call waiting is not activated "Not Possible" will be displayed).

    IMPORTANT: Speed extending and dialling DTMF digits excludes each other.

IMPORTANT: Other specific Attendant Console / AC-Win and Attendant Group features as night services, call retrieval, control of diversion, call interception etc. are not supported by Attendant Light.

11.2.1.2 Interworking with other features

- Attendant Light device cannot act as ACD agent (attribute **AGENT**) and/or ACD supervisor (attribute **SUPER**) (blocked by AMO SDAT).
- **Chief/Secretary**

  The Attendant Light device cannot be a TEAM/CHESE member (attributes **TEAMSECR** and **TEAMEXEC**) (blocked by AMO SDAT).
- **Recall**

  Works as recall after Single Step Transfer.
- **Hunt group**

  Hunt group search type linear (**LIN**) and cyclic (**ZYK**) are supported.
  Using the extension code number 0

  In the case of customers for whom a further extension code number 0 is to route from the CO to the Attendant Light, in addition to the hunt group number for the Attendant Light, the Attendant Light can be configured as a "none" night service destination of the attendant console group (VFGR) 0.

  ```
  ADD-WABE:CD=0,CPS=6,DAR=ATNDDID;

  ADD-VFGKZ:TYPE=ATNDGR,CD=0,ATNDGR=0;

  ADD-NAVAR:NOPTNO=8,TYPE=STN,STNO=<No.
  of attendant light>;
  ```
- **Trunk night service destination**

  The ACLight can be configured as the trunk night service destination for ACLight in branch networks at the respective trunk access of the branches (see also Chapter 160, "Trunk Night Service".

11.2.1.3 Restrictions

- The Attendant Light is implemented with the hunt group feature. AMO VFGR, AMO VFGKZ and AMO NAVAR are not used.

  Exception: Use of the Attendant Light as a night service destination (see Section 154.1.2, "Interworking with other features" > **Using the extension code number 0**).
- The feature to be configured in AMO SDAT (**TYPE=ATTRIBUTE,AATTR=ACLIGHT**) cannot be displayed in OpenScape 4000 V7 R1 in AMO SBCSU (DISPLAY-SBCSU).

  This is possible as of OpenScape 4000 V7 R2.

11.2.2 Generation (Example)

11.2.2.1 Master Hunt Group

Subscriber number and hunt group number are the same. Subscriber can only be called as Attendant Light with 900.

- Configure OpenStage device with busy lamp filed

```
ADD-SBCSU:STNO=900,OPT=OPTI,CONN=DIR,
PEN=1-25-2-0,DVCFIG=OPTIP500,TSI=1,COS1=23,
COS2=9,LCOSV1=1,LCOSV2=1,LCOSD1=2,LCOSD2=2,DPLN=0,
ITR=0,SSTNO=N,COSX=0,SPDI=10,SPDC1=0,IDCR=N,REP=0,
STD=56,SECR=N,INS=Y,ALARMNO=0,RCBKB=N,RCBKNA=N,
DSSTNA=N,DSSTNB=Y,DIGNODIS=N,CBKBMAX=5,HEADSET=N,
HSKEY=NORMAL,CBKNAMB=Y,TEXTSEL=GERMAN,HMUSIC=0,
COMGRP=0,BLF=Y;
```

- Configure key layout for OpenStage device
  `CHANGE-TAPRO:STNO=900,STD=65;`
- DSS key administration:

```
ADD-ZIEL:TYPE=DSS,SRCNO=900,KYNO=1,DESTNOD=25501,
DEV=AD1;
```

- Configure Attendant Light device as a master in hunt group for getting a call queue:

```
ADD-WABE:CD=900,DAR=STN;

ADD-SA:TYP=TLN,RNR=900,VBZ=0,
ART=LIN,ANOKAP=20,NAME="ATTENDANT LIGHT",
VERLNEXT=NEIN,ANZART=SA;
```

- Configure device as Attendant Light device

```
CHANGE-SDAT:STNO=900,TYPE=ATTRIBUT,
AATTR=ACLIGHT;
```

11.2.2.2 Code Hunt Group

Subscriber number and hunt group number are different. Subscriber can be called as Attendant Light with 900 and as subscriber with 25502 (without attendant queue).

- Configure OpenStage device with busy lamp filed

```
ADD-SBCSU:STNO=25502,OPT=OPTI,CONN=DIR,
PEN=1-25-2-0,DVCFIG=OPTIP500,TSI=1,COS1=23,
COS2=9,LCOSV1=1,LCOSV2=1,LCOSD1=2,LCOSD2=2,DPLN=0,
ITR=0,SSTNO=N,COSX=0,SPDI=10,SPDC1=0,IDCR=N,REP=0,
STD=56,SECR=N,INS=Y,ALARMNO=0,RCBKB=N,RCBKNA=N,
DSSTNA=N,DSSTNB=Y,DIGNODIS=N,CBKBMAX=5,HEADSET=N,
HSKEY=NORMAL,CBKNAMB=Y,TEXTSEL=GERMAN,HMUSIC=0,
COMGRP=0,BLF=Y;
```

- Configure key layout for OpenStage device
  `CHANGE-TAPRO:STNO=22502,STD=65;`
- DSS key administration:

```
ADD-ZIEL:TYPE=DSS,SRCNO=22502,KYNO=1,
DESTNOD=25501,DEV=AD1;
```

- Configure Attendant Light device as a master in hunt group for getting a call queue:

```
ADD-WABE:CD=25502,DAR=STN;

ADD-WABE:CD=900,DAR=HUNT;

ADD-SA:TYPE=VCE,CD=900,ITR=0,STNO=25502,
STYPE=LIN,CQMAX=20,NAME="ACLIGHT",LVAFTEXT=N,
LSTMBOFF=Y,DISPTYPE=HT;
```

- Configure device as Attendant Light device

```
CHANGE-SDAT:STNO=25502,TYPE=ATTRIBUT,AATTR=ACLIGHT;
```

11.2.2.3 Configure key layout for busy lamp field

```
CHANGE-TAPRO:STD=65,DIGTYP=OST40BLF,KY09=VACANT,
KY10=VACANT,KY11=VACANT,KY12=VACANT,KY13=VACANT,
KY14=DSS,INFO="DR";

CHANGE-TAPRO:STD=65,DIGTYP=OPTIA1,KY01=DSS,
KY02=DSS,KY03=DSS,KY04=DSS,KY05=DSS,KY06=DSS,
KY07=DSS,KY08=DSS,KY09=DSS,KY10=DSS,KY11=DSS,
KY12=DSS,KY13=DSS,KY14=DSS,KY15=DSS,KY16=DSS,
KY17=DSS,KY18=DSS;

CHANGE-TAPRO:STD=65,DIGTYP=OPTIA2,KY01=DSS,
KY02=DSS,KY03=DSS,KY04=DSS,KY05=DSS,KY06=DSS,
KY07=DSS,KY08=DSS,KY09=DSS,KY10=DSS,KY11=DSS,
KY12=DSS,KY13=DSS,KY14=DSS,KY15=DSS,KY16=DSS,
KY17=DSS,KY18=DSS;

CHANGE-TAPRO:STD=65,DIGTYP=OPTIA3,KY01=DSS,
KY02=DSS,KY03=DSS,KY04=DSS,KY05=DSS,KY06=DSS,
KY07=DSS,KY08=DSS,KY09=DSS,KY10=DSS,KY11=DSS,
KY12=DSS,KY13=DSS,KY14=DSS,KY15=DSS,KY16=DSS,
KY17=DSS,KY18=DSS;

CHANGE-TAPRO:STD=65,DIGTYP=OPTIA4,KY01=DSS,
KY02=DSS,KY03=DSS,KY04=DSS,KY05=DSS,KY06=DSS,
KY07=DSS,KY08=DSS,KY09=DSS,KY10=DSS,KY11=DSS,
KY12=DSS,KY13=DSS,KY14=DSS,KY15=DSS,KY16=DSS,
KY17=DSS,KY18=DSS;

CHANGE-TAPRO:STD=65,DIGTYP=OPTIA5,KY01=DSS,
KY02=DSS,KY03=DSS,KY04=DSS,KY05=DSS,KY06=DSS,
KY07=DSS,KY08=DSS,KY09=DSS,KY10=DSS,KY11=DSS,
KY12=DSS,KY13=DSS,KY14=DSS,KY15=DSS,KY16=DSS,
KY17=DSS,KY18=DSS;
```

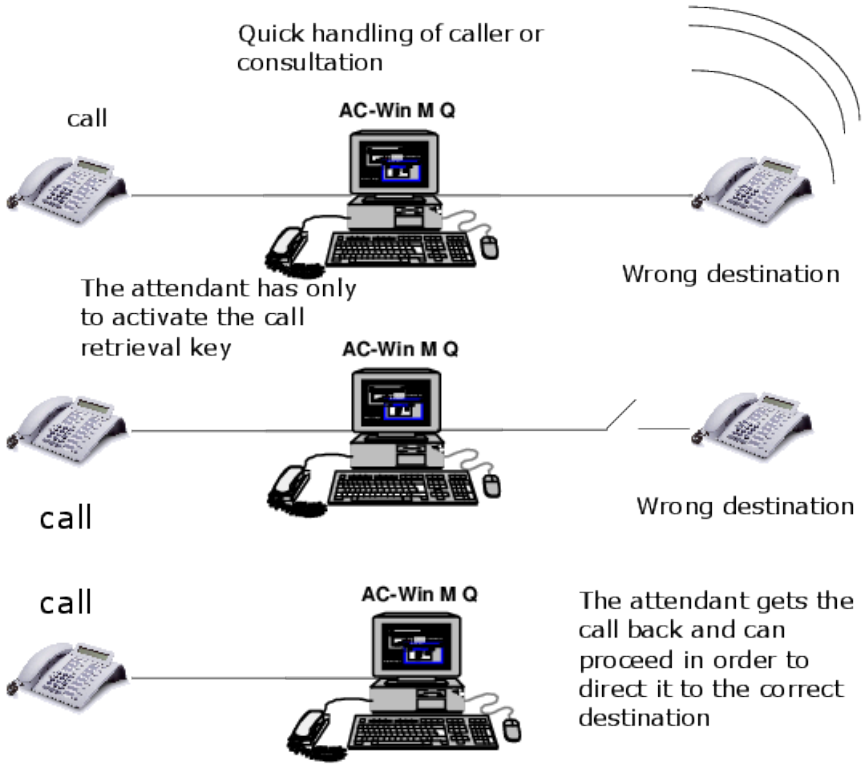
11.2.3 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
SDAT	EMERK=ACLIGHT	de	Gerät als Attendant Light konfigurieren
	AATTR=ACLIGHT	e	Configure device as Attendant Light
SA	TYP=SPR	d	Sammelanschluss des Typs "Sprache"
	TYPE=VCE	e	Hunt group type "Voice"
	RNR	d	Rufnummer des Sammelanschlusses
	CD		Hunt group access code
	ART	d	Suchart des Sammelanschlusses (linear oder zyklisch)
	STYPE	e	Search type of hunt group (linear or cyclic)
	ANOKAP	d	Anrufordnerkapzität
	CQMAX	e	Call ordering/queuing capacity
SBCSU	TLNNU	de	Rufnummer des Attendant Light Teilnehmers
	STNO	e	Number of the Attendant Light subscriber
	ART=OPTI	de	Hauptrufnummer des OpenStage-Endgerätes
	OPT=OPTI	e	Configure main number of OpenStage
	BLF=JA	d	Belegtlampenfeld (optional)
	BLF=YES	e	Busy lamp field (optional)
TAPRO	SNU=65	d	Tasten-Layout 65
	STD=65	e	Key layout 65
	TDxx=DR	d	Direktruftaste konfigurieren
	KYxx=DSS	e	Configure direct station selection key
ZIEL	QLRUFNU	d	Quellenrufnummer
	SRCNO	e	Source number
	TASNU	d	Tastennummer
	KYNO		Key number

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	DZLRUFNU	d	Zielrufnummer für Direktruf
	DESTNOD	e	Destination number for direct station selection

11.3 Call Retrieval

The Call Retrieval feature can be used on an Attendant Console to recover the last call, that the operator has transferred to an extension on behalf of an incoming call (local or remote)



11.3.1 Feature Description

This feature is released for operators using an ACWin (MQ) console. It can be used network wide in an homogeneous OpenScape 4000/HiPath 4000 and mixed OpenScape 4000/HiPath 4000 /DX networks. Only the last transfered call can be retreieved

11.3.2 Service Information

An internal or external extension A (any device type), who was requesting a call service from the operator, can be retrieved by the operator, if the operator has prior transferred the extension A to

- An alerting internal or external extension B and extension B has not answered yet
- An alerting internal or external extension B with activated CFNR feature and the call was forwarded to extension C and extension C has not answered yet
- A hunt/distribution group and no group member has answered yet
- A paging device and the paged user has not answered yet
- An ACD group and no agent or supervisor has answered yet
- An undialed CO trunk line and the remote CO extension has not answered yet
- A busy internal or external extension B (w/o camp-on)
- An alerting or busy internal or external extension B and the operator has provided incoming call service to another extension C but has not transferred extension C to somewhere else

An internal or external extension A (any device type), who was requesting a call service from the operator, can not be retrieved by the operator, if the operator has prior transferred the extension A to

- An internal or external extension B in talk state
- An alerting internal or external extension B and extension B has answered the call after the transfer
- An alerting or busy internal or external extension B and the call was already released
- An alerting or busy internal or external extension B and a recall is queued to the operator from extension B due to timer expiration
- An internal or external extension B and extension B has parked the call to another internal or external extension C
- an alerting or busy internal or external extension B and all loop keys on the ACWin (MQ) console are busy
- Voicemail server

11.3.3 Generation (Example)

- The Call Retrieval feature can be activated by the following command:
  `CHANGE-ZAND:TYPE=ATND,CALLRETR=YES;`
- The Call Retrieval feature can be deactivated by the following command:
  `CHANGE-ZAND:TYPE=ATND,CALLRETR=NO;`

11.3.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
ZAND	RUFRUECK	d	Gesprächsrückholung in der Anlage aktiviert

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	CALLRETR	e	Call retrieval set for the system

11.4 Code Calling System Basic

The CC (code calling/paging system) is connected to the system via the TMOM module. For the paging input, several circuits can be assigned (except for MEET-ME mode).

Depending on the code calling/paging equipment, the following operating modes are possible:

1) DISPLAY: station number of the paging party is displayed
2) VOICE ANNOUNCEMENT: talking facility to the paged party
3) MEET-ME: the paged party answers with an individual answering code and is switched to the paging party by the code calling equipment. For this operating mode, a special answering circuit (station line) must be configured for the code calling equipment with the AMO SSC. It is assigned a special administration code (CCNO), which is not entered in the DPLN. If several paging systems are installed, each one must be assigned a special answering circuit for MEET-ME operation.
4) MIXED MODE WITH CODE DIGIT: the operating mode (DISPLAY, VOICE, MEET-ME) or the type of code call (URGENT or NORMAL) is determined by the user, who dials a specific code ditit after the paged party's number.
5) TRANSPARENT MODE: the paged party's number need not be entered in the DPLN as a station number; it is transparently dialled through to the code calling system as a B-block. This mode is possible in conjunction with all operating modes mentioned above.

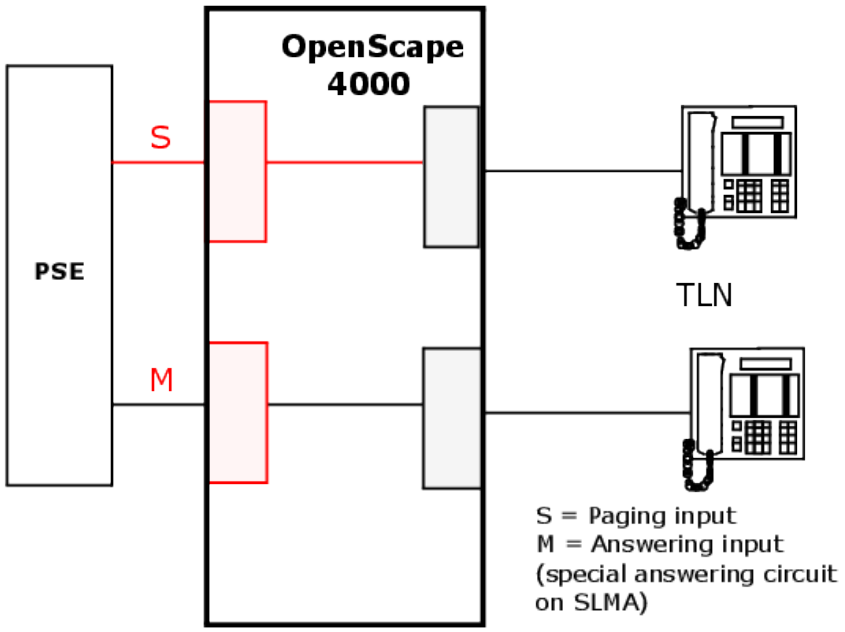


Figure 119: PSE configuration with Meet-me conference

11.4.1 CC in DISPLAY OPERATION

- Add the paging codes in the DPLN

  ```
  AD-WABE:CD=key-num,DAR=CCSN;
  ```
- Configure the TMOM module

  ```
  AD-BCSU:MTYPE=PER,LTU=number,SLOT=number,
  PARTNO=string;
  ```
- Add trunk group
  ```
  AD-BUEND:NO=number;
  ```
- Add class of trunk
  ```
  AD-COT:PAR=NTON;
  ```
- Assign a class of parameter

  ```
  AD-COP:PAR=DTMF&SACK&LSUP&PDP2&IDP1&DTM1;
  ```

  Parameter CCR depends on the type of code calling system! Value EOD can only be assigned with ESPA interface!
- Add a line circuit

  ```
  AD-TSCSU:COTNO=number,TGRP=number,DEV=CC,
  COPNO=number, *)
  ```

  *) for AMO TSCSU, the parameters must be declared as follows:

WIRES	=	depending on the system, 2, 3 or 4 wires
SUPV	=	SUPV1
ACKT	=	SZACK2
STADIAL	=	STADIAL1
ABLK	=	Y (paging party's station number is transmitted)
STNOLEN	=	0 (station number = paging number)

Assign a route for the code calling system

```
AD-RICHT:TYPE=CD,CD=key-num,CPS=1&2&3&4&5&6&7&8&9,
SVC=VCE,TGRP1=number;
```

IMPORTANT: CPS 6 (incoming CO trunk) is not assigned as paging via the public network is not provided. The CPSs 10&11&12 are only required for inter-PABX traffic.

11.4.2 CC in VOICE ANNOUNCEMENT Operation

Same as for DISPLAY OPERATION, except that parameter ABLK=N (NO) must be declared in AMO TSCSU.

11.4.3 CC in MEET-ME Operation

- Assign paging and answer codes
  `AD-WABE:CD=key-num,DAR=CCSN;`

  `AD-WABE:CD=key-num,DAR=CCANS;`
- Assign trunk group, class of trunk, class of parameter and trunk as for DISPLAY OPERATION, with the following differences:

  AMO COP: value CCM must be added to values for PAR AMO TSCSU: ABLK = N

  IMPORTANT: CPS 6 (incoming CO trunk) is not assigned as paging via the public network is not provided. The CPSs 10&11&12 are only required for inter-PABX traffic.
- Assign answering line circuit on SLMA
  `AD-SSC:TYPE=CC,CCNO=number,ITR=number;`
- Assign a route for the code calling equipment
  `AD-RICHT:TYPE=CD,CD=key-num,RTECD=number,`
  `CPS=1&2&3&4&5&8&9,SVC=VCE,CCNO= number;`

  The CPSs 10&11&12 are only required for inter-PABX traffic.

CD	=	Code calling (paging) code
RTECD	=	Answer code
CCNO	=	Administration number for special answering circuit

11.4.4 Code Calling in MIXED MODE Operation with CODE DIGIT

- The code digits are assigned in the DPLN according to the operating modes and paging modes of the code calling system.

CCDIS	Code digit	for	DISPLAY OPERATION
CCMEETME	"	"	MEET-ME
CCITN	"	"	DISPLAY (overwrite)
CCVCE	"	"	VOICE ANNOUNCEMENT
CCSURG	"	"	URGENT PAGING
CCS	"	"	NORMAL PAGING

In addition, the digit analysis result CCSCD (code calling with code digit) must be assigned in the DPLN instead of CCSN. If MEET-ME operation is possible, a code must also be assigned for the digit analysis result CCANS.

- Configure the trunk module and trunk group, assign the class of trunk and class of parameter and configure the trunk circuit as for DISPLAY OPERATION.
  - In the case of MEET-ME operation with code digit, the value CCM must be specified for the parameter PAR in the COP command.
  - In the case of DISPLAY OPERATION (CCDIS and CCITN), the parameter ABLK=Y must be declared in the TSCSU command.
- In addition, for MEET-ME operation with code digit, the special answering circuit must also be configured (AMO SSC), as well as the routes for the code calling and answering codes (see Section 156.3, "CC in MEET-ME Operation").

11.4.5 Code Calling in TRANSPARENT MODE Operation

The transparent mode is possible for all types of operation, and is set by declaring the parameter STNOLEN in the TSCSU command.

STNOLEN	= 0	means no transparent mode; the recipient's address must be assigned in the DPLN.
STNOLEN	= 1-20	means transparent mode will be used, and defines the length of the code to be transmitted to the CC (B-blocks). The code length can either be fixed or variable, depending on the ENDRAUT parameter (in AMO ZAND:TYPE=CCM): ENDRAUT = NO: fixed length ENDRAUT = YES: variable length STNOLEN defines the maximum length. Terminate shorter codes with '#'. En-bloc dialing (number redial, destination keys, key module, etc.) is not possible, if mixed mode with code digit Section 156.4, "Code Calling in MIXED MODE Operation with CODE DIGIT" is used.

11.5 General Night Switching Options

11.5.1 Feature Description

The system renders a range of night switching options available, which can be administrated in the system and are identifiable through their option number. Is is possible to assign one attendant group (ATNDGR) to as many as eight of these night switching options (NOPTNOs) respectively. Which of these night switching options handles the representation of the ATNDGR in the night service can then be specified on an individual basis at an attendant console (ATND) of the ATNDGR. In night service, the attendant group (ATNDGR) can be represented by a night switching option (NOPT). All calls to the attendant group (ATNDGR) are signalled at a free station assigned to this night switching

option. The assignment of the stations (STN) to the night switching options can be administrated in the system (AMO NAVAR).

- Universal Answering Options of this nature comprise precisely one station, which is configured especially for "Universal Answering".
- Station Option Options of this nature comprise up to 10 configured extensions. (Seizure takes place in cyclic form.)
- Internal Centralized ATNDGR Option An option of this nature comprises a centralized ATNDGR within the switch and is identified via its ATND group number. An internal centralized ATNDGR can only be assigned to one night switching option. However, this centralized ATNDGR need not yet be configured in an attendant group, i.e. the existence of the ATNDGR is not checked.
- External Centralized ATNDGR Option An option of this nature comprises a ATND group within the network and is identified via the code for the centralized ATND service and the destination number of the switch. An external centralized ATND service can only be assigned to one night option. However, neither the station access code nor the destination number need be configured.

11.5.2 Service Information

- Normally, a recall remains at the night service option which originally connected the call, and does not follow a call forwarding on no answer which may have taken place.

  NOTICE: Call forwarding on no answer (CFNA) to the night switching option takes place if the RECALL FROM HOLD NIGHT STATION is activated in the central system data and if a call forwarding destination is defined. Via AMOs or ComWin: Enter the parameter RENSFWD= yes of AMO ZAND's DATEN3 branch and configure a call forwarding destination by entering parameter UAERT=CFNR of AMO ZIEL's FWD branch.

- Call forwarding on busy (CFB) is not supported for night switching options.
- Recall to a night switching option which is a master hunting group does not follow the hunting group.

11.5.3 Generation (Example)

- Assign the stations for possible night switching option(s) as follows:

	Configuration Management > Port > Station Port. A port for universal night answer however in the menu branch: Configuration Management --> Port -->Special Station Port.

	Depending on the desired night station:
	
	`ADD-SBCSU: Assign night station or`
	
	`ADD-SCSU: Assign night station`
	
	`ADD-SSC: Assign port for universal answering`

- Assign the possible night switching option as follows:

	A dummy option can only be administrated via the expert mode. Expert Mode > ComWin > Open ... <IP> via AMO (see AMO command). Further options, such as night stations and universal night answer can be configured via Configuration Management > Groups > Night Switching options.

	Depending on relevant night switching option types:
	
	`ADD-NAVAR:NOPTNO=number,TYPE=L; (dummy option)`
	
	`ADD-NAVAR:NOPTNO=number,TYPE=STN,STNO=number; (station)`
	
	`ADD-NAVAR:NOPTNO=number,TYPE=GENANS, GENANSNO=num; (universal answering)`
	
	`ADD-NAVAR:NOPTNO=number,TYPE=CASINT, ATNDGR=num; (interna l centralized ATND service)`
	
	`ADD-NAVAR:NOPTNO=number,TYPE=CASEXT, CD=number; (external centralized ATND service)`

11.5.4 Expand a Night Option

Only possible for night stations (STN). All other options cannot be expanded.

- A night station is added as follows:

	Configuration Management --> Groups --> Night Switching Options, Night Stations tab. Enter the number of night switching options to be expanded and click the Search button. Click Add entry (right icon) and enter the new call number in the new field. (This procedure must be repeated for each call number).
	`CHA-NAVAR:NOPTNO=<navarnu>,FUNCT=ADD, TYPE=STN,STNO=<number>;`

11.5.5 Reduce a Night Option

Only possible for night stations (STN). All other options must be completely removed.

- A night station is deleted as follows:

	Configuration Management --> Groups --> Night Switching Options, Night Stations tab. Enter the call number of the extension to be deleted and click the Search button. Now highlight the extension to be deleted (right icon) and save.

	Via SNTN number specification:
	`CHA-NAVAR:NOPTNO=<number>,FUNCT=DEL,`
	`TYPE=STN,STNO=<tln_number>;`

11.5.6 Delete a Night Option

- The assignment to an ATND group is deleted as follows

	Deletion can only be administrated via the expert mode. Expert mode --> ComWin --> Open ...< IP> via AMO (see AMO command).
	Depending on the required option number: `CHA-VFGR:ATNDGR=<number>,{NOPT1=0,....,NOPT8=0};`

- An existing night switching option in the system is deleted as follows:

	Configuration Management --> Groups --> Night Switching Options, Night Stations tab. Enter the number of the night switching options to be deleted, click the Search button and then the Delete button.
	Via night switching option number: `DEL-NAVAR:NOPTNO=<number>;`

11.5.7 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
NAVAR	NAVARNU	d	NACHTVARIANTENNUMMER
	NOPTNO	e	NUMBER OF NIGHT SWITCHING OPTION
	TYP	d	GERAETETYP DER NACHTVARIANTE
	TYPE	e	NIGHT ANSWER CATEGORY

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	RNR	d	PLATZKENNZAHL DER EXTERNEN ZVFGR
	CD	e	CODE FOR EXT. CENTRALIZED ATND SERVICE
	VFGRU	d	VF-GRUPPENNUMMER
	ATNDGR	e	ATND GROUP NO.
	TLNNU	d	RUFNUMMER EINER NEBENSTELLE
	STNO	e	STATION NUMBER
VFGR	VFGRU	d	NUMMER DER VERMITTLUNGSFERNSPRECHER - GRUPPE
	ATNDGR	e	ATTENDANT GROUP NUMBER
	NTVAx	d	DER NACHTVARIANTE x ZUGEORDNETE VARIANTE (x=1-8)
	NOPTx	e	DEVICE(S) ASSIGNED TO NIGHT OPTION x (x=1-8)
ZAND	RUNSUML	d	Ein/ausschalten 'Wiederanruf des gehaltenen Teilnehmers'
	RENSFWD	e	Act/deact system option 'recall from hold/ night station'

11.6 Multiple Code Calling System CCM

The multiple code calling equipment (CCM) is connected to the system via the TMOM module. One circuit on the TMOM must be configured per code pair (normal and urgent code calling). Up to 15 code calling jobs can be entered via this circuit.

In the Meet-Me mode, the connection to the paging party is set up by the OpenScape 4000; unlike single-call paging, multiple paging does not have a special answering circuit.

If the 15 paging jobs are not sufficient, another TMOM circuit must be assigned to the CCM for a further code pair. In this case, the paged parties are assigned to one of the two code calling codes!

One code for normal code calling (CCMS) and one code for urgent code calling (CCMSURG) should always be set up. In the Meet-Me mode, the answering code (CCMANS) must be added.

Unlike single-call code calling, multiple code calling equipment also uses CO trunks for paging.

Multiple code calling can be set up in the following modes:

1) DISPLAY operation (call number of calling party is shown on receiver display)
2) Meet-Me

In addition, the following features can be configured for the multiple code-calling system:

3) Meet-Me operation with display
4) Display sequence of meet-me number and calling party number can be reversed
5) Calling party's number can be displayed left-justified or right-justified; display is filled or truncated accordingly
6) Block separator characters and end-of-block characters can be defined
7) CCM with code conversion
8) Parallel ringing of exchange calls when FWD/FNANS activated to CCM in Meet-Me operation
9) Priority signalling of urgent exchange calls for CCM in Meet-Me operation
10) Recorded announcements for CCM in Meet-Me operation
11) Multiple code calling of the same paging number
12) Suffix dialling to CCM when busy
13) Paging with on-hook handset internally and throughout network

11.6.1 CCM in Display Operation

In this mode it is possible to answer a paging Digite or Anate which pages when in consultation hold. To answer the station must dial the displayed station number.

- Add the code calling codes in the DPLN
  `AD-WABE:CD=key-num,DAR=CCMS;`

  `AD-WABE:CD=key-num,DAR=CCMSURG;`
- Add the configuration data for the TMOM
  `AD-BCSU:MTYPE=PER,LTU=number,SLOT=number, PARTNO=string;`
- Assign the trunk group
  `AD-BUEND:NO=1;`
- Add class of trunk
  `AD-COT:PAR=NTON;`
- Add the class of parameter
  `AD-COP:PAR=DTMF&SACK&BR64&LSUP&PVWZ& IDP1&DTM3;`

  Parameter CCR, if code calling release after every call is required (no queuing). Parameter EOD only with code-calling systems with "Call accpeted" / "Absence" signalling.
- Add the trunk circuit parameters
  `AD-TSCSU:COTNO=number,TGRP=number,DEV=CCM, *)`

  *) in the TSCSU command, the parameters must be declared as follows:

WIRES	=	2,3,4 or 6 wires, depending on code calling system
SUPV	=	SUPV1

ACKT	=	SZACK2
STADIAL	=	STADIAL1
STNOLEN	=	0
TBT	=	CCMEOD1
EOD	=	CCMEOD2
SRCHORD	=	15
SRCHATT	=	1
OPTYPE	=	DIS&BLKSEP&BLKEND&NOICPTRA (or other parameters, refer to AMO description)
WAIT	=	NOTRDY1
SRCHCANT	=	only if DELANS has been specified with parameter OPTYPE (see CTIME timers for CCM)
WAITT	=	Default value (see CTIME timers for CCM)
CDGT	=	Code digits from 0 to 9, with 1st digit for normal code calling and 2nd digit for urgent code calling. The digits must be specified as required by the code calling system.
CONV	=	Conversion of dialled number to CC code

For CCM in DISPLAY operation, the TSCSU parameter MABLK must be set to the number of digits of the calling party's number which are to be displayed, i.e. the parameter must be set to a value greater than '0' (see also CCM in Meet-Me operation with Display).

- Assign route to multiple code calling system
  `AD-RICHT:TYPE=CD,CD=key-num,RTECD=key-num, SVC=VCE,TGRP1=number;`
- Delete code calling job after going on-hook
  `CHA-ZAND:TYPE=CCM,DEL=YES;`
- Suffix dialling if busy
  `CHA-ZAND:TYPE=CCM,POSTDBSY=YES;`

NOTICE: The node number assigned to the CCM (NNO parameter of TACSU AMO) is evaluated by the KNMAT AMO for display number modification for DISPLAY operation or Meet-Me operation with display. This number must be a unique number (see also Display Number Modification with AMO KNMAT).

11.6.2 CCM in Meet-me Operation

- Assign codes for normal code calling, urgent code calling and answering in the DPLN
  ```
  AD-WABE:CD=key-num,DAR=CCMS;

  AD-WABE:CD=key-num,DAR=CCMSURG;

  AD-WABE:CD=key-num,DAR=CCMANS;
  ```
- Add configuration data for the TMOM module
  ```
  AD-BCSU:MTYPE=PER,LTU=number,SLOT=number,
  PARTNO=string;
  ```
- Assign a trunk group
  ```
  AD-BUEND:NO=number;
  ```
- The COT and COP parameters are entered as for DISPLAY operation, except that the COP parameter CCM for Meet-Me operation must also be specified.
- The trunk circuit is assigned as for DISPLAY OPERATION except:

  SRCHATT = 5, default value (max. 99 possible) and OPTYPE=Meet-Me instead of DISPLAY.
- Configure the circuit with the TSCSU AMO as for DISPLAY operation. The only parameters which are different are SRCHATT=5 (standard value, max. 99 possible) and OPTYPE=MEETME.

  For CCM in Meet-Me operation, the TSCSU parameter MABLK must be set to '0', i.e. calling party's number is not displayed (see also CCM in Meet-Me operation with Display).
- Assign route to multiple code calling system
  ```
  AD-RICHT:TYPE=CD,CD=key-num,RTECD=key-num,
  SVC=VCE,TGRP1=number;
  ```

11.6.3 CCM in Meet-me Operation with Display

- Configure the circuit with the TSCSU AMO as for Meet-Me operation (OPTYPE=MEETME).

  DIFFERENCE:

MABLK	This parameter defines the length of the number to be displayed on the code calling receiver (calling party's number/A-block).
Type of Input:	Single value, optional
Possible Values:	0
	1 - 16

Default Value: 0 (no number is displayed; standard Meet-Me operation)

NOTICE: The node number assigned to the CCM (NNO parameter of TACSU AMO) is evaluated by the KNMAT AMO

for display number modification for DISPLAY operation or Meet-Me operation with display. This number must be a unique number (see also Display Number Modification with AMO KNMAT)

11.6.4 Reversing the Number Display Sequence

For CCM in DISPLAY operation, you can reverse the display sequence of the number blocks on the CCM receiver devices by setting the ZAND parameter AAFTERB. This means that the A-block will be displayed after the B-block, i.e. the display sequence will be "answering number - calling party's number - answering code" (B-block/A-block/C-block).

- Set new display sequence "answering number - calling party's number - answering code"
  `CHA-ZAND:TYPE=CCM,AAFTERB;`

  Default Value: AAFTERB i s n o t set (i.e. standard sequence A-block/B-block/C-block, i.e. "calling party's number - answering number - answering code")

  An answering code will only be displayed if assigned with the TSCSU AMO.

11.6.5 Left-Justified/Right-Justified A-Number Display

The standard display mode is right-justified. This means that if the calling party's number (A-block number) is longer than the number of digits specified in the MABLK parameter, the beginning of the number will run off the left side of the display block. If the A-block number is shorter than the number of digits specified in the MABLK parameter, the left side of the display block will be filled in with zeroes.

If the display mode is set to left-justified, the end of the calling party's number will run off the right side of the display block, if too long. If shorter, the right side of the display block will be filled in with zeroes. You can change the display mode as follows:

- Set left-justified display mode
  `CHA-ZAND:TYPE=CCM,ADISPEND;`

  Default Value: ADISPEND i s n o t set (right-justified display mode)

  The total length of A-block + B-block + C-block, including separators and end-of-block characters, must not exceed 22 characters, otherwise the A-block will be truncated.

11.6.6 CCM with Block Separators and End-of-Block Characters

The length of the calling line information element varies according to where a caller is calling from (e.g. 12 digits for calls from digital ISDN exchanges, 0 digits for calls from analog exchanges, or 5 digits for internal calls). To compensate for this, some multiple code-calling systems can interpret block separator characters (*) and an end-of-block character (#). These special characters allow you to set a variable A-block length The block separator characters

separate the A-block, the B-block, and the C-block of a code-calling block. If an answering code is defined, the end-of-block character follows the C-block. If no answering code is defined, the end-of-block character follows the B-block.

- Configure the circuit with the TSCSU AMO as for CCM in DISPLAY operation or CCM in Meet-Me operation with display;

  DIFFERENCE:
  `OPTYPE=DIS&BLKSEP&BLKEND,`

  or
  `OPTYPE=MEETME&BLKTSEP&BLKEND,`

  and
  `MABLK=16 (maximum length);`

  In this case, for incoming calls from analog exchanges (calling line identification information element is 0), a single zero is transmitted in the A-block.

  If the code-calling system requires fixed lengths for the A block and the B-block, you should specify a fixed length for the A-block, and omit the block separators. In this case, if the answering number differs from the number of the calling party, the left or right side of the answering number display block (B-block) will either be filled in with zeroes (if the number is shorter) or the number will run off the left or right side of the block (if longer).
- Configure the circuit with the TSCSU AMO as for CCM in DISPLAY operation or CCM in Meet-Me operation with display;

  DIFFERENCE:
  `OPTYPE=DIS&NOBSEP&NOBEND,`

  or
  `OPTYPE=MEETME&NOBSEP&NOBEND,`

  and
  `MABLK= betewen 1 and 16;`

11.6.7 CCM with Code Conversion

If the station numbers used for code-calling responses in the OpenScape 4000 system (answering number in the B-block) are not the same as the search codes of the CCM, you must assign a code conversion table for these numbers. More than one search code can be assigned to the same station number (answering number), if required.

- Enable answering number/search code conversion for CCM
  `AD-TSCSU:,,DEV=PSM,,CONV=Y;`
- Assign a conversion table for the CCM

  ```
  AD-PERSI:TYPE=CCM,CCMSCD=key-num,STNO=number,
  CCNO=key-num;
  ```

11.6.8 Parallel Ringing of Exchange Calls if FWD/FNANS Activated to CCM in Meet-me Operation

Direct-dialled calls from digital and analog exchanges to users who have activated call forwarding or forwarding on no answer to the CCM system can be rung in parallel. This means that the user's telephone will continue ringing while he or she is being paged.

- Enable parallel rining for CCM in Meet-Me operation
  `CHA-ZAND:TYPE=CCM,STNRNG=Y;`

11.6.9 Priority Signalling of Urgent Exchange Calls for CCM in Meet-me Operation

Incoming exchange calls which are direct-dialled to the CCM system, or forwarded to the CCM system from a user's telephone, are signalled with the "urgent" CCM priority code (CCMSURG).

- Configure circuit with the TSCSU AMO as for CCM in Meet-Me operation.

  DIFFERENCE:
  `CDGT=x y; x = normal call, y = urgent call`

11.6.10 Announcements for CCM in Meet-Me Operation

Looped Announcements via Musiphon

For CCM systems in Meet-Me operation, a looped announcement can be played back to the calling party via Musiphon connected to an SLMA, instead of the code calling or paging tone (`CHA-ZAND:TYPE=CCM,SRCHTN=KNTNINT/MUSIC/RNGTNINT`).

- Enable announcement playback for internal and external calls to CCM in Meet-Me operation
  `CHA-ZAND:TYPE=CCM,ANNINTCC=Y,ANNEXTCC=Y;`
- Assign CCM tone (HOLDCCS) to SIU tone TSL or PEN TSL
  `CHA-ZAND:TYPE=TONES,CP=HOLDCCS,SIU=1 to n;`

  or
  `AD-SSC:PEN=a-b-c-d,TYPE=EXTANN,CPCALL=HOLDCC;`

  Callers from digital exchanges will always hear the r i n g b a c k tone; if parallel ringing is enabled for CCM in Meet-Me operation, callers from both digital and analog exchanges will hear the r i n g b a c k tone.

Synchronized Announcements

For CCM systems in Meet-Me operation, a synchronized announcement can be played back to the calling party via an external announcement unit connected to a TMOM, instead of the code calling or paging tone (`CHA-ZAND:TYPE=CCM,SRCHTN=RNGBK/ACTION/MUSIC`).

COP parameter CCR must be set for the calling line. If the calling line is a digital exchange the COP parameter ABPD (initial answering) must also be set. In addition, the synchronized announcement for call to CCM must be enabled centrally (`ZAND:TYPE=CCM,SYNCACCM=YES`)

Synchronized announcements are used for providing callers with a specific sequence of information prompts, depending on the call progress/traffic situation of the incoming call, in order to achieve specific reactions.

The prompts/announcements are achieved by connecting external announcement units to TMOM boards. Each prompt or announcement is heard from the beginning. Up to 50 callers can listen to an announcement at any one time. The announcement is not LTG-dependent.

The attributes of an announcement are defined in a specific announcement type (= announcement name). Between 1 and 64 announcement units or tone sources can be combined to form a single announcement type. This is done by configuring the TMOM boards for synchronized announcements (RAS), and assigning them to the same announcement type.

For more details, and instructions on how to configure a TMOM board for synchronized announcements, please refer to the AMO Usage Examples' section "Announcerment Unit, Synchronized Announcements".

Example:

Callers to the multiple code-calling system CCM should hear a synchronized announcement. The announcement is not to be repeated. After the announcement, the CCM hold tone is to be fed in for as long as possible. The call waiting tone (knocking/camp-on tone) is to be defined as the entry tone, and the ringback tone is to be defined as the exit tone. The required operating mode is "Start/Stop", and an announcement start delay timer of 2 seconds is to be set.

- Enable announcement for CCM in Meet-Me mode
  `CHA-ZAND:TYPE=CCM,SYNCACCM=YES`
- Assign announcement type 4:
  `AD-SYNCA: ANTT,4,Mueller_Inc,ON,,,HOLDCCS,255,`
  `ON,,,,,,,STA_STO,2;`
- Assign entry tone/exit tone for ANNCCM announcement reason
  `AD-SYNCA: ANNTONE,ANCCM,CAMP,RNGBK;`
- Assign announcement reason / announcement type table: Depending on the ITR code number of the incoming call, the announcement type 4 must be assigned to the announcement reason ANNCCM. The ITR numbers used depend on the types of call situation for which the announcement is required.
- If the CCM is reached by direct dialling, and the code-calling number dialled belongs to an internal user, the called user's ITR (5) is used.
  `AD-SYNCA: ANNMITR, ANCCM, 5, 4;`
- If the code-calling number dialled belongs to an external user, the calling user's ITR (7) is used.
  `AD-SYNCA: ANNMITR, ANCCM, 7, 4;`
- If the CCM is reached via call forwarding/forwarding on no answer after dialling an internal user's number, the ITR of the internal (forwarding) user (8) is used.
  `AD-SYNCA: ANNMITR, ANCCM, 8, 4;`
- If the CCM is reached via call forwarding/forwarding on no answer after dialling an external user's number, the caller's ITR (7) is used.

If the CCM system is operated without initial answering, callers from digital exchanges will always hear the r i n g b a c k tone; if parallel ringing is enabled for CCM in Meet-Me operation, callers from both digital a n d analog exchanges will hear the r i n g b a c k tone.

11.6.11 Display Number Modification with AMO KNMAT

The displayed number (calling number, i.e. number of code-calling party) can be shortened and/or supplemented with the aid of the KNMAT AMO. This is possible for internal and external code-calls alike; however, the number modification is only possible for numbers in the OpenScape 4000 numbering plan (NPI=UNKNOWN), and not for the PRIVATE or ISDN numbering plans.

NOTICE: For DISPLAY operation, or Meet-Me operation with display, the node number assigned to the CCM (NNO parameter of TACSU AMO) must be a unique number, since it is evaluated by the KNMAT AMO for display number modification.

- Configure the circuit with the TSCSU AMO as for DISPLAY operation, or Meet-Me operation with display.

  DIFFERENCE:

  NNO = Virtual node number.

  Type of Input: Single value or up to 3 linked single values, optional

  Possible Values: kkk, jjj-kkk or ii-jjj-kkk, where

kkk	=	1-999 (level 0 node code)
jjj	=	0-253 (level 1of multi-level node address)
ii	=	0-29 (level 2 of multi-level node address)

  See also ZAND AMO description, branch: ALLDATA, parameter: NNO

  Default Value: 0-15
- Add modification table data:

  CHA-KNMAT:

NPI	=	UNKNOWN, i.e. OpenScape 4000-specific numbering plan
LEVEL	=	0, single value, mandatory
ONNO	=	1-999, i.e. explicit source node number or
ONNOL	=	OWN/ROW, i.e. own node or all nodes
DNNO	=	node number assigned to CCM
MODCON	=	OUT, i.e. for outgoing traffic to CCM
NUMEXT	=	"number extension", i.e. digits prefixed to displayed number
NUMRED	=	"number reduction", i.e. digits removed from beginning of displayed number

  If no display number modification is to be carried out, and if the logical node number ROW is entered in the KNMAT matrix, you must enter the following:

- Add modification table data:

  CHA-KNMAT:

NPI	=	UNKNOWN, i.e. OpenScape 4000-specific numbering plan
LEVEL	=	0, single value, mandatory
ONNO	=	1-999, i.e. explicit source node number.
Logical node type ONNOL=ROWonly applies to those nodes for which no other modification type is assigned		
DNNO	=	node number assigned to CCM
MODCON	=	NONE
NUMEXT	=	"number extension", i.e. digits prefixed to displayed number[21]
NUMRED	=	"number reduction", i.e. digits removed from beginning of displayed number[21]

Example

The system has the node number 1-1-100; the calling numbers of all outgoing connections are prefixed with '19' (CHA-KNMAT:UNKNOWN,0,100,,,ROW,,OUT,19;).

The CCM is assigned the node number 1-1-37, the length of the display number is set to '6':
`CHA-TSCSU:PEN=<pen>,DEV=CCM,NNO=1-1-37,MABLK=6;`

Provided no other value is entered in the node connection matrix for node number 37, the display number of an internal call is modified by prefixing the digits '19' =>display number: 19 3100.

1) No modification:
`CHA-KNMAT:UNKNOWN,0,OWN,37,,,NONE,19;`

=> display number: 00 3100

2) Display numbers of calls from node 1-1-200 are to be prefixed with '17':
`CHA-KNMAT:UNKNOWN,0,200,,37,,,OUT,17;`

=> display number: 17 3100

11.6.12 Multiple code calling of the same paging number

Simultaneous code calling of the same paging number can be set. When answering, the calling party who is longest in the search queue and can be reached is selected.

- Set, if multiple code calling of the same paging number is allowed
  `CHA-ZAND:TYPE=CCM,SRCHONCE=YES/NO;`

[21] i.e. digit prefixes which are not to be added or removed

11.6.13 Suffix dialing to CCM with busy

Suffix dialing to CCM from Digite or Anate can be executed for a call to busy.

- Set, if suffix dialing to CCM is allowed for a call to busy.
  `CHA-ZAND:TYPE=CCM,POSTDBSY;`

11.6.14 Paging with on-hook handset internally and throughout network

It is possible to replace the handset after the call without releasing the job. Paging with an on-hook handset can be used both internally and externally throughout the net.

The CCM key lights up during netwide paging with on-hook handset. When the CCM key is pressed, the job is released in the node with the CCM connection.

- Set, if the paging job continues after handset replacement
  `CHA-ZAND:TYPE=CCM,DEL=YES/NO;`

  (entries must be made in the node of the paging party).

11.6.15 CTIME Timers for CCM

If a multiple code calling system has less search jobs than the number specified in the TSCSU AMO, the system starts a corresponding number of dummy tasks. For each dummy task in the search queue, a timer is started which takes the same amount of time to run down as a normal search job.

The next search job in the queue is not transmitted until the dummy task timer (WAIT1/2) has timed out. This allows the system to achieve near-constant time cycles for each repeat beeping.

With the CTIME AMO, you can configure the system to delete unanswered search jobs after a specific number of attempts, or to keep unanswered search jobs in the search queue for a specific length of time (to allow users more time to answer).

Search jobs are deleted when the timer runs out (CLRANS1/2/3/4).

For administration purposes, the two timers WAIT1 and WAIT2 are sufficient, since the OpenScape 4000 system permits a maximum of two multiple code-calling systems to be configured. These timers can be set between 0.5 and 5 seconds (in steps of 100 ms) .

- Change timers for first and second dummy task:

  `CHA-CTIME:TYPESWU=CCM,WAIT1=1000,WAIT2=2000;`
- Display timers for first and second dummy task:

```
DIS-CTIME:TYPESWU=CCM;
""
"   TIMERS FOR MULTIPLE CODE-CALLING SYSTEMS:"
"   ========================================"
"   +---------------------+---------------------+---------------------+"
"   | NOTRDY1  =  @@@@ SEC. | NOTRDY2  =  @@@@ SEC. | WAIT1    =  1000  MS. |"
"   | WAIT2    =  2000  MS. | CLRANS1  =  @@@@ SEC. | CLRANS2  =  @@@@ SEC. |"
"   | CLRANS3  =  @@@@ SEC. | CLRANS4  =  @@@@ SEC. |                       |"
```

```
"    +----------------------+----------------------+----------------------+"
""
```

- Regenerate the call processing timers:

```
REGENERATE-CTIME;

"CHA-CTIME:CP,@,@@,@,@@@,@@@,@@@,@@,@@@,@@@,@@@,@,@,@@@,@@@,@,@@,@@,@@@,"

"@@@,@@@,@@,@@@@@,@@@@@,@@@@@,@@@@@,@@@@@,@@@@@,@@@@@,"

"@@@@@,@@@@@,@@@@@,@@@@@,@@@@@,@@@@@,@@@@@,@@@@@,@@@@@,"
"@@@,@@@,@@,@@@,@@@,@@;"
"CHA-CTIME:TRK,@@@,@@@,@@@,@@@,@@,@@@;"
"CHA-CTIME:ATND,@@,@@,@@,@@;"
"CHA-CTIME:CCM,@@,@@,1000,2000,@@@,@@@,@@@,@@@;"
"CHA-CTIME:RES,@@@@@,@@@@@,@@@@@,@@@@@,@@@@@,@@@@@,@@@@@,@@@@@,@@@@@,"

"@@@@@,@@@@@,@@@@@;"
```

11.7 Remote Night Station Changeover

11.7.1 Feature Description

Previously, night stations (nightoptions/night variants) could be changed at an active attendant console or via AMO (See Chapter 153, "Attendant Console"). Also night stations can be changed at standard terminals as well as from an attendant console. The authorization will be assigned as a classmark in a COS for a specific group.

It will be possible for authorized users (regardless of whether the stations are defined as night stations or not) and authorized attendants in any attendant console group to change specific night stations within a system or other OpenScape 4000 systems that are connected via CorNet-N/Cornet-NQ.

Sequence of changeover

1) Dial the authorization code for activating the night station (*88).
2) Dial the ATNDGR access code for the attendant group whose night station you wish to change. This access code must be unambiguous throughout the network.
3) Dial the NOPT number of the night station you wish to change (1 to 8).
4) Terminate the action by entering '#'.

You can link several changes within the same system, e.g. you can change the night options for up to three attendant groups at the same time. Use the flash key (*) as a separator.

11.7.2 Service Information

- Only one attendant console group can be switched simultaneously in any other OpenScape 4000 system.

- The attendant code must be unique in the network.
- A maximum of 22 digits is possible.
- The DAR cannot be used for incoming trunks.

11.7.3 Generation (Example)

- Configure the digital analysis result as follows:
  `ADD-WABE:CD=*88,DAR=NOPT;`
- Configure authorization for switching as follows:
  `CHA-COSSU:TYPE=COS,COS=number,AVCE=NOPTCD;`
- The station must have appropriate authorization to use this feature.

11.7.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
WABE	RNR	d	Verzweigungsparameter
	CD	e	access code/station number
	KZP	d	Kennzahlpunkt
	DAR	e	Digit analysis result
COSSU	TYP	d	Verzweigungsparameter
	TYPE	e	Desired cossu option
	COS	d	Class-of-Service Nummer fuer Sprache (FAX)
	COS	e	class of service number for voice (FAX)
	ESBER	d	Einfügen COS-Optionen fuer Sprache
	AVCE	e	Add cos options for voice

11.8 Trunk Night Service

With the release of HPath 4000 V1.0 the night service function of the system is further enhanced.

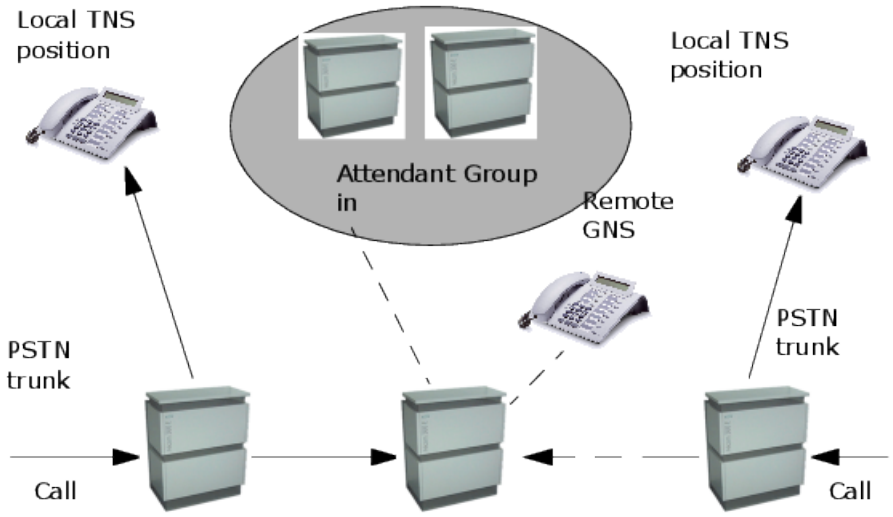


Figure 120: Trunk night service

11.8.1 Feature Description

The feature is based on the existing night service. In order to improve the facilities of network wide night service configuration, the following enhancements has been implemented:

(Remark: The night service feature does not depend on the type of the used attendant groups. The following descriptions are valid for Multiple Queue-MQ groups and Double Queue-DQ groups as well.).

The attendant console activates night mode by clicking the night button in the Buttons window or by pressing the Night key on the keyboard. The DAY/NIGHT Service indication in the call control window shows NIGHT.

This can also be achieved by unplugging the handset.

11.8.1.1 Console night service

When an attendant activates night mode in an attendant group with a least one other attendant in day mode, then the attendant is in Console Night Service. When the Attendant enters CNS then all dedicated calls to the console (e.g.Recalls Serial Calls etc) are changed to general calls and these are represented to the group. Personal calls to the Attendant are however disconnected and the caller recieves a notification of this.

The source button in the call control window will be disabled and appear grey to the user.Indication of calls in the source queue will still be presented to the console and will increment.

Outgoing calls can still be made as normal.

11.8.1.2 Group night service

When all attendants of an attendant group have activated night mode, the Group Night Service is active. The displays and keys are as CNS above.

This feature can be split into different requirements and their solutions.

Local Extension calls to an AC Group

When an AC group is night service (GNS) local extension calls shall always follow the GNS destination.

Incoming CO trunk calls

Group night service for trunk calls (GNS). Trunks follow the GNS destination where no individual night answer point is defined for the trunk as in the case for extension calls.

Trunk night service (TNS see below) If set for the system will override GNS.

Centralised attendant functionality

Incoming CO calls in a break-in node automatically routed to a remote AC group use the centralised attendant functionality (CAC). On encountering the remote attendant group in night service the break -in node is informed of the night status of the CAC and the GNS answer point. The decision as to which night answer point to route to is made in the break-in node i.e follow the GNS of the CAC or route to the TNS destination of the incoming trunk.

If trunk night service is active (ZAND:ATND- INIGHT=YES) in the centralized attendant switch, centralized attendant has night mode activated and rerouting is permitted, all calls will be diverted to the assigned night destination by rerouting to the originating switch.

The counter for CAS-diversions (ZAND: CACFWMAX) will be checked and incremented also for night diversions to internal centralized attendant.

11.8.1.3 Trunk night service

For each incoming networking trunk a local or netwide night service destination can be defined (TDCSU / TACSU parameter INIGHT), which is used for trunk night service instead of the group night service destination.

TNS is active if a TNS destination is configured for the trunk and the feature is enabled within the system (AMO ZAND:ALDATA,INIGHT=YES).The TNS is active independent of the active night option and the user cannot decide as to whether a call is routed to the GNS or TNS target. The decision is made on a per attendant group basis by a new parameter in VFGR :- INIGHTPR.

The most important trunk night service configurations are described in Section 160.4, "Generation (Examples)". The feature must be enabled / disabled generally with the system wide parameter **INIGHT** (ZAND:ATND). If disabled, group night service GNS is active for trunk calls. If enabled, the processing of trunk calls depends on the parameter **INGHTACT** (ZAND:ATND). This system wide parameter defines an AC group within the network (from the originating node point of view) on which the trunk night service destination instead of the group night service destination should be used. I.e., assuming there is a sequence of CAS-diversions how many diversions are allowed before switching to the TNS destination.

11.8.2 Restrictions

The feature has the following restrictions:

- GNS destinations (Analog or Digital) within OpenScape 4000 can only be local.
- If the TNS destination is a single device (analog or digital)there is no call waiting terminating feature (camp on) .Therefore a master hunt group should be configured to allow camp on of more than 1 night service call
- If the TNS destination is busy the system will try after a time out a new attempt to connect i.e, it will be polled. This could cause additional traffic on a network
- Cot parameters FWDN and FNAN must be set in all transit and centralised attendant nodes to enable the feature to work

11.8.3 AMO Usage Examples

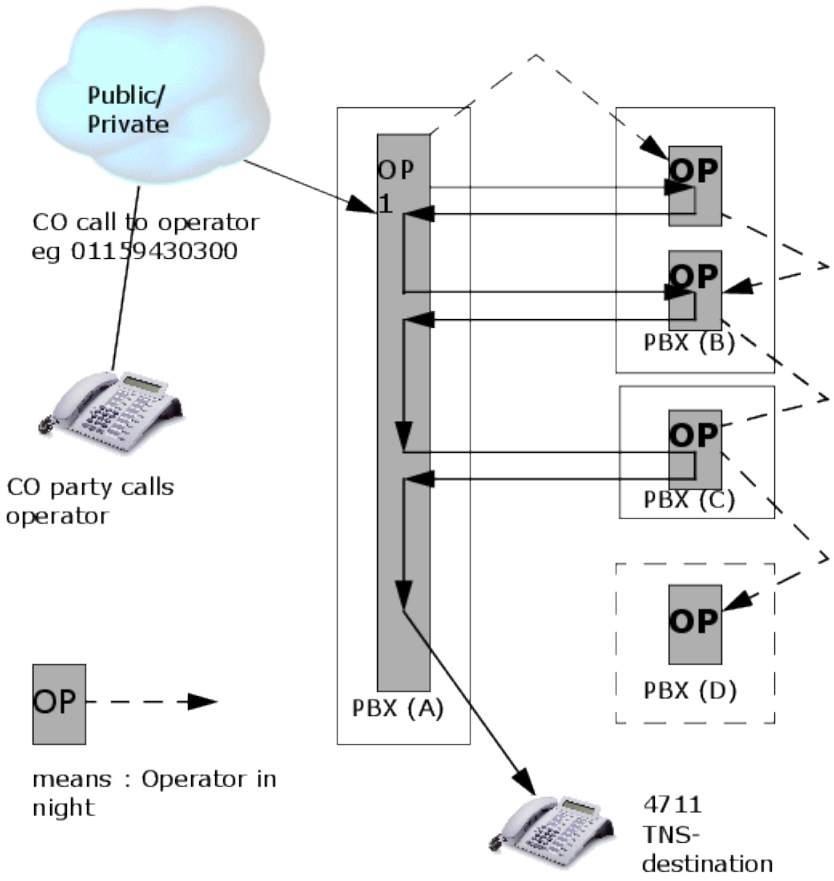


Figure 121: Call flow (routing) for INGHTACT = 4 in PBX(A)

Figure 125 illustrates the call flow (routing) for INGHTACT = 4 in PBX(A).

Operator (OP1) in PBX(A) has activated night mode to external centralized attendant OP2 in PBX(B). This attendant group in PBX(B) is in night mode to internal centralized attendant OP3, which is in night to another centralized

attendant (OP4) in PBX(C). This attendant group in PBX(C) has also activated night mode to another external centraized attendant OP5 in PBX(D).

Assuming, there's only a trunk night service destination on the CO-trunk configured(not on tie lines), INGHTACT in PBX(A) marks an attendant group, whichs night mode causes the diversion to the trunk night service destination in the originating switch.

- INGHTACT = 0: trunk night destination 4711 is always called (independent of night / day mode of OP1)
- INGHTACT = 1: trunk night destination 4711 is called, if called attendant group OP1 is in night mode.
- INGHTACT = 2: trunk night destination 4711 is called, if the centralized attendant OP2 is in night mode.
- INGHTACT = 3: trunk night destination 4711 is called, if 2nd centralized attendant OP3 is in night mode.
- INGHTACT = 4: trunk night destination 4711 is called, if 3rd centralized attendant OP4 is in night mode.

IMPORTANT: A device will not change its authorization level (COS), if used as trunk night destination. Furthermore, no parallel call situation will be supported at the trunk night destination.

The parameter **INIGHTPR** (AMO VFGR) controls, whether the trunk night service activation should depend on the activated night variant number 7 or not:

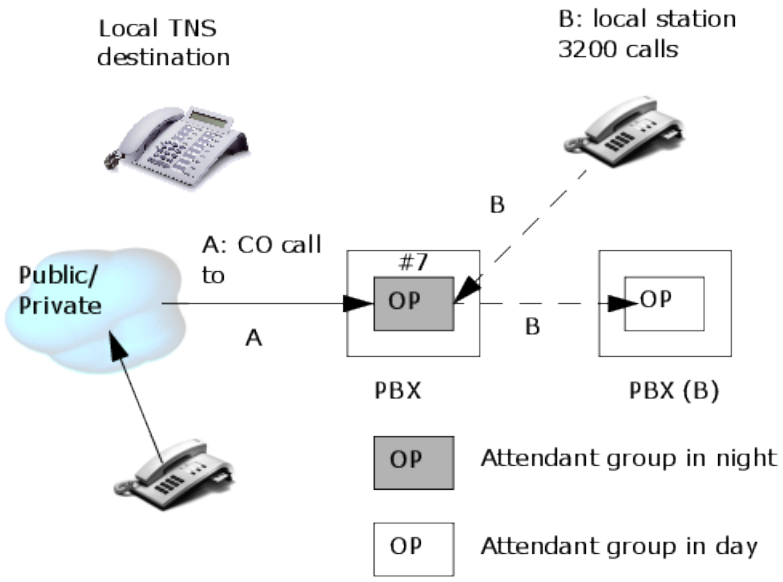
- INIGHTPR = NO :trunk night service is only active, if the activated night variant number equals #7 (this can give the attendant some measure of control)
- INIGHTPR = YES: trunk night service is always active.TNS is independent of the active NAVAR number and always has priority over the GNS.

If a trunk call is night-diverted to a busy trunk night destination, the call will be queued into the call queue of the final diversion initiating attendant / centralized attendant. By timer expiration a next diversion request will be started to the busy TNS destination.

11.8.4 Generation (Examples)

11.8.4.1 Trunk Night Service

Incoming CO calls to the operator (attendant group) should come to a local trunk night destination 4711, only if operator has activated night option 7 (in the example, night option 7 is night mode to external centralized attendant)



Parameter settings in PBX(A):

- AMO ZAND:ATND
  - INIGHT = YES
  - INGHTACT = 1
  - CACFWMAX >= 1
- **AMO VFGR**
  - INIGHTPR = NO
  - CASMFC = YES
- AMO VFGKZ
  - ATND+ATNDDID entries required
- AMO TDCSU / TACSU
  - INIGHT = 4711 (trunk night service destination number)

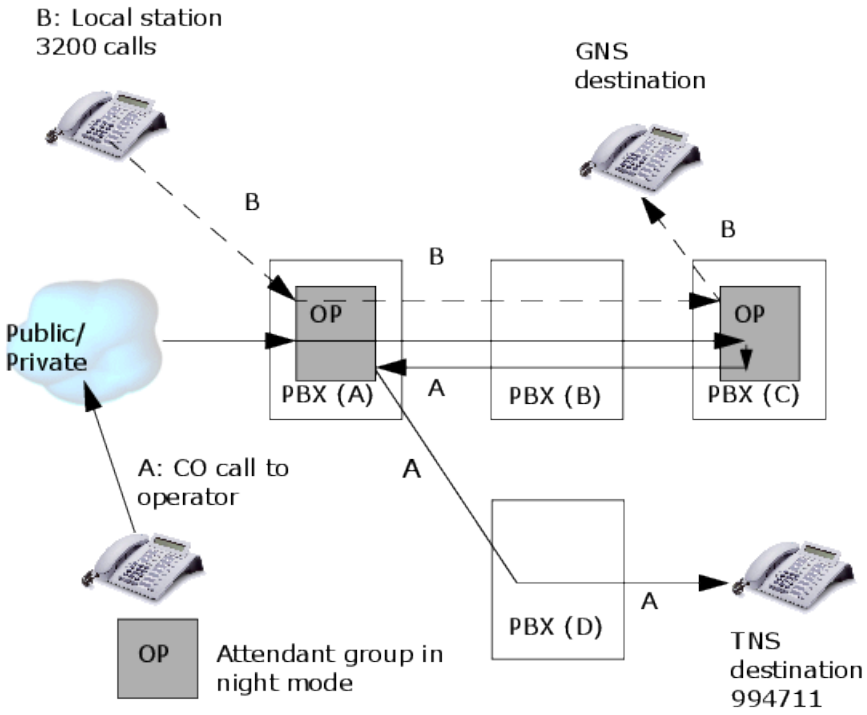
Parameters have to be set in all affected break-in-nodes / trunks of the network.

11.8.4.2 Centralized Attendant Configuration

In this scenario Trunk calls from CO should come to the trunk night service destination

994711, if the centralized attendant has activated night mode, but independent of the activated

night variant number. Local operator calls should terminate at the group night service destination.



11.8.4.2.1 Parameter settings

AMO	Parameter	PBX(A)	PBX(B)	PBX(C)
ZAND:ATND	INIGHT	YES	n/a	YES
ZAND:ATND	INGHTACT	2	n/a	2
ZAND:ALLDATA	CACFWMAX	>=2	n/a	>=2
VFGR	INIGHTPR	n/a	n/a	YES
VFGR	CASMCF	YES	n/a	YES
VFGKZ	ATND AND ATNDID	Entries reqd	n/a	Entries reqd
COT	FNAN FWDN	n/a	set for i/c trunk	set for i/c trunk
TACSU/TDCSU	INIGHT	External number 994711 set for i/c CO trunk	n/a	n/a

11.8.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Description
ZAND	VF=ENACHT	d	NEIN : Leitungsnachtschaltung ist deaktiviert. Lokale Anrufe bei einer VF-Gruppe im Nachtbetrieb werden immer an das aktive GNS-Ziel weitergeleitet JA: Leitungsnachtschaltung ist aktiviert. Amtsgespräche zu einer VF-Gruppe werden abhängig von der effektiven Betriebseinstellung des Vermittlungsplatzes und der ZVFs sowie von der effektiven Netzkonfiguration an TNS-Sonderziele weitergeleitet.
	ATND=INIGHT	e	NO : Trunk night service is deactivated.i.e local calls to an attendant group in night mode will always be forwarded to the activated group night service YES: Trunk night service is activated i.e trunk calls to an attendant group will be forwarded to special trunk night service destinations dependent on the actual mode of the attendant, the centralised attendants and on the actual network configuration.
	ENCHTAKT	d	0.....9 Legt fest, wie viele GNS-Umleitungen zulässig sind, bevor ein TNS-Ziel angesteuert wird. Der Wert von ENCHTAKT wird nur dann berücksichtigt, wenn die Leitungsnachtschaltung generell mit ENCHTAKT=JA/NEIN aktiviert wurde.
	INGHTACT	e	0.....9 Defines the number of group night service diversions to be allowed before a trunk night service destination is called. The value of INGHTACT takes affect only if trunk night service is generaly activated with INIGHT= YES/ NO.
	ZVFUMMAX	d	0,,,,,9 Der Grenzwert für die zulässige Anzahl Umleitungen an ZVFs sollte zumindest identisch mit dem ENCHTAKT-Wert sein.

AMO	Parameter	Sprache/ Language	Description
	CACFWMAX	e	0,,,,,9 The limit for the permited number of centralized attendant diversions should be at least equal to the INGHTACT value.
VFGR	ENACHTPR	d	NEIN: Amtsgespräche werden nur dann an das TNS-Ziel weitergeleitet, wenn die Nachtoption 7 aktiviert ist. JA: Die Leitungsnachtschaltung wird unabhängig von der aktiven Nachtoption aktiviert.
	INIGHTPR	e	NO: Trunk calls will be routed to the trunk night service destination only if the number of the activated night variant is 7. YES: Trunk night service is invoked independently of the activated night variant number
	ZVFMFAUL	d	zvf extern mit mehrfacher aul
	CASMCF	e	YES : The feature "multiple centralised attendant" feature is enabled NO: The feature is deactivated
VFGKZ	RNR	d	Kennzahl einer Vermittlungsfernsprecher-gruppe
	CD	e	Attendant console group access code
COT	AULN	d	Anrufumleitung ohne Bedingungen per Rerouting netzweit. Gültig für alle Satztypen. Ist der Parameter gesetzt, wird im Umleitungsfall die Umleitungsrufnummer an den Ursprungsknoten zurückgegeben, der daraufhin zu dieser Rufnummer eine neue Verbindung aufbaut. Die erste Verbindung wird ausgelöst. Gilt für alle digitalen Verbindungssätze und muß im gesamten Netz gesetzt werden. Ab EV1.0 wird AULN durch den COT Parameter PRZL ergänzt, der beim Programmieren einer netzweiten AUL die Zielprüfung veranlaßt. Parameter AULB und AULN schließen sich aus !!

AMO	Parameter	Sprache/ Language	Description
	FWDN	e	ICall forwarding without conditions via rerouting network-wide. Valid for all kind of trunks. If parameter is set, the call forwarded number is send back to origination node which will create a new connection to this station number. The first connection will be released. Valid for all digital trunks and has to be set in whole network! Since EV1.0 FWDN is enhanced by parameter CFVA which activates a check for destination number when programming a network-wide CFWD. Either parameter FWDN or CFBN may be set.
	RWSN	d	Einschalten der Rerouting Funktion bei Rufweiterschaltung. Gültig für alle Satztypen und netzweit.
	FNAN	e	Call forwarding no-answer via rerouting. Valid for all kind of trunks.
TACSU/ TDCSU	ENACHT	d	einzelnachtstelle
	INIGHT	e	individual night station i.e. per incoming line
CTIME	ATNDTNSR	d	setup-meldungsfrequenz (leitungs-nachtservice besetzt)
	ATNDTNSR	e	ATNDTNSR=3,....100 seconds : When a call is routed by night service to a trunk night destination which is busy ,the call is queued in a suitable attendant call queue and this timer is started. After the timer expires the call is routed again to the trunk night destination. If the destination is still busy ,ATNDTNSR will be started again

11.9 Universal Night Answer

11.9.1 Feature Description

Universal night answer or trunk answer from any station is a night option. Incoming calls are routed to an analog port (e.g. for universal ringing). The trunk call can then be taken at any telephone by dialling a code.

Each port for "trunk answer from any station" is assigned a neutral night variant of the type "GENANS" by means of its administration number and the NAVAR AMO. Only one port of this kind is permissible for each night option. This neutral night option is then assigned to the ATND group as one of the night options 1-8.

11.9.2 Service Information

- Prior to deletion of the port, the night option belonging to it must be deleted (interrogation and deletion of the appropriate night option with the NAVAR AMO). Before this, however, the night option must be released from the allocation to the ATND group (VFGR AMO).
- If this night variant was the only one, or was provided for automatic night service (AUTNS), this must be replaced by a substitute variant by means of CHANGE-VFGR.Service Information

11.9.3 Generation (Example)

- Configure the module (SLMA)

	Click Configuration Management --> System Data --> Module --> Module, New. Enter the port equipment number with LTG, LTU, EBT, select SLMA part number and save.

	The module is configured via AMO BCSU:
	`ADD-BCSU:TYPE=PER,LTU=<number>,`
	`SLOT=<number>,PARTNO=<string>;`

- Configure a universal night answer code:

	Click Configuration Management --> Tables --> Dial Plan --> Dial Code, New. Enter the dial code and select GENANS as the dial code type and save.
	A digit analysis result GENANS is configured via AMO WABE: `ADD-WABE:CD=<key-num>,DAR=GENANS;`

- Configure a universal night answer port (privileged station):

	Click Configuration Management --> Port --> Privileged Station Port, New. Enter station number, select as "universal night answer" and save.
	The privileged station is configured via AMO SSC: `ADD-SSC:TYPE=GENANS,UNANO=<anumber>;`

- Configure a night option (for GENANS):

	Click Configuration Management --> Groups --> Night Options, New. Enter night bell number, select as "universal night answer" type and save.

	The night option is configured via AMO NAVAR:
	`ADD-NAVAR:NOPTNO=<nnumber>,`
	`TYPE=GENANS,GENANSNO=<anumber>;`

- Assign a code for universal night answer:

	Assignment can only be administrated via expert mode. Expert Mode --> ComWin --> Open ...< IP> via AMO. (See AMO command).

	The code is configured via AMO VFGKZ:
	`ADD-VFGKZ:TYPE=ATNDGR,CD=<key-num>,`
	`ATNDGR=<number>;`

- Extend ATNDGR with night option:

	ATND group configuration can only be administrated via expert mode. Expert mode --> ComWin --> Open ...< IP> via AMO. (See AMO command).

	The ATND group is configured via AMO VFGR:
	`CHA-VFGR:ATNDGR=number,{NOPT1,...,NOPT8},`
	`OPT=<number>;`

11.9.4 Relevant AMOs

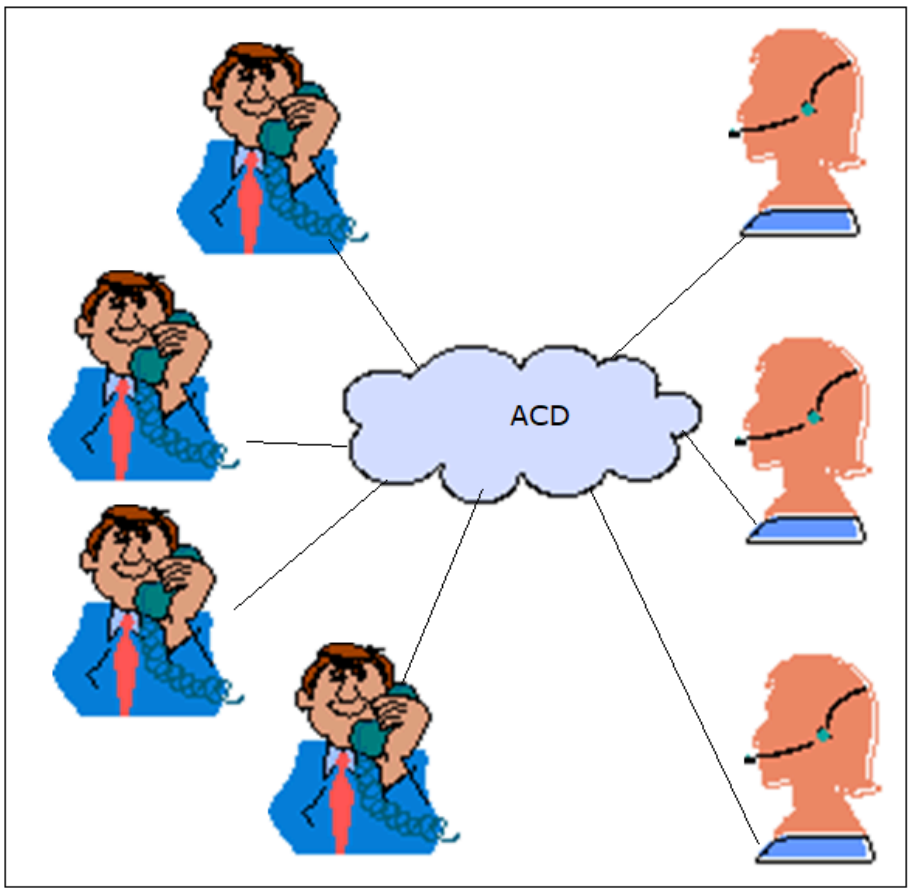
AMO	Parameter	Sprache/ Language	Beschreibung/ Description
NAVAR	NAVARNU	d	NACHTVARIANTENNUMMER
	NOPTNO	e	NUMBER OF NIGHT SWITCHING OPTION
	TYP	d	GERAETETYP DER NACHTVARIANTE
	TYPE	e	NIGHT ANSWER CATEGORY
	ABFNU	d	NUMMER EINES FUER ALLG.-ABFRAGEN EINGERICHTETEN GERAETES
	GENANSNO	e	DEVICE NUMBER OF PREASSIGNED UNIVERSAL NIGHT ANSWER STATION
SSC	TYP	d	TYP DER AUSGABE
	TYPE	e	SPECIAL STATION TYPE
	ARUFNU	d	RUFNUMMER DES ABF-ANSCHLUSSES
	UNANO	e	DEVICE NUMBER OF NIGHT ANSWER STATION / BELL
WABE	RNR	d	Verzweigungsparameter

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	CD	e	access code / station number
	KZP	d	Kennzahlpunkt
	DAR	e	Digit analysis result
VFGKZ	TYP	d	VERZWEIGUNG: KENNZAHL - VF-GRUPPE
	TYPE	e	TYPE OF FUNCTION
	RNR	d	KENNZAHL EINER VERMITTLUNGSFERNSPRECHER-GRUPPE
	CD	e	ATTENDANT CONSOLE GROUP ACCESS CODE
	VFGRU	d	VERMITTLUNGSFERNSPRECHER-GRUPPE
	ATNDGR	e	ATTENDANT GROUP NUMBER
VFGR	VFGRU	d	NUMMER DER VERMITTLUNGSFERNSPRECHER - GRUPPE
	ATNDGR	e	ATTENDANT GROUP NUMBER
	EINGVA	d	IM NACHTSCHALTUNGSFALL ZU AKTIVIERENDE VARIANTE
	OPT	e	NIGHT OPTION ON ACTIVATION OF NIGHT MODE
	NTVAx	d	DER NACHTVARIANTE x ZUGEORDNETE VARIANTE x = 1 ... 8
	NOPTx	e	DEVICE(S) ASSIGNED TO NIGHT OPTION x x = 1 ... 8

12 ACD

12.1 ACD (Automatic Call Distribution)

12.1.1 Enhanced Agent Feature Operation after Soft Restart



Examples of features maintained include but are not limited to:

- Agent to Supervisor Messages
- Call Forwarding
- Manual Hold
- callback
- conference
- repeat id
- dds/dss
- message waiting
- recall
- park to station/group park
- consult,transfer and toggle

12.1.1.1 Feature Description

This feature enhancement only applies to logged on ACD Agents that are connected to an ACD call from an external (outside the private network) source. The intent is to allow the Agent to have access to activation of all features following a soft restart just as it did before any restart.

12.1.1.2 User Interface

There is no special user interface for this feature enhancement. The feature applies to all ACD routed calls from an external source connected/talking to an (non-PhoneMail) ACD Agent.

12.1.1.3 Service Information

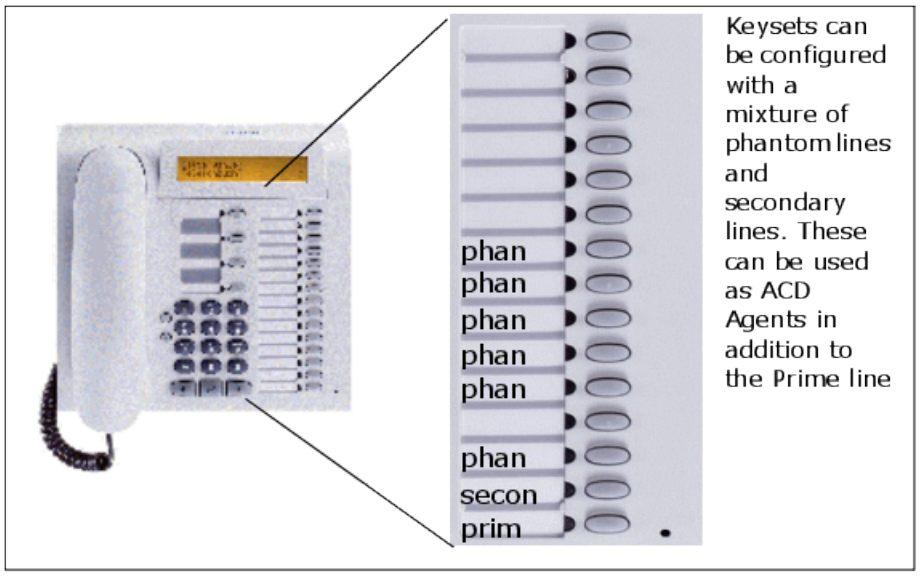
No special configuration is necessary for this feature enhancement. And no AMO usage is required.

12.1.2 Phantom Lines as Agents

12.1.2.1 Feature Description

A phantom line is synonymous with a signed-off keyset line. Essentially, this is a line that is currently not attached to a PEN number. Phantom/Signed-off keyset line appearances remain in service even though they do not have a physical line assigned. This feature enhancement allows a properly class marked phantom line to operate as an ACD Agent.

e.g. An Agents Keyset is configured with one prime line. In addition to the prime line the keyset may also have one or more phantom lines configured in addition to additional secondary lines. The Agent can log on to the prime line and all the secondary lines provided there are different logon I.D.'s are used for each line.



An Agent can never transition between a phantom Agent and a non-phantom Agent. That is, a phantom Agent is not permitted to sign-on and be assigned to a physical line. Similarly, a prime line Agent cannot sign-off and have its remaining line appearances become phantom Agent appearances.

12.1.2.2 User Interface

A phantom line can log on as an ACD Agent only if it is classmarked as an Agent (AGENT) and it is restricted from both signing on and signing off (NORELOC).

```
CHANGE-SDAT:STNO=2222,TYPE=ATTRIBUT,AATTR=NORELOC;
```

IMPORTANT: The NORELOC attribute blocks the line it is assigned to from performing autoset relocation (sign-on/ sign-off). A phantom Agent must be logged off from the line appearance where the phantom was initially logged on.

Operation of the phantom Agent line is the same as for other keyset lines which are Agents. The phantom line must be selected either manually or via the keyset's originating line preference setting for the phantom Agent line to be in use.

Some ACD features only operate on ACD keysets -- keysets whose prime line is an Agent. Also note that the ACD LEDs that indicate Agent modes and call queue status only apply to the device's prime line and not any secondary or phantom line appearance.

Phantom lines can be classmarked as ACD Supervisors (SUPER) and as autologon extensions (AUTOLOG). However, phantom lines are blocked from acting as ACD group Supervisors and from being automatically logged on.

12.1.2.3 AMO Usage

Two methods exist for creating a phantom Agent. This is because there are two ways in which the line can be signed-off.

12.1.2.3.1 Create a Phantom Agent Via Feature Access Code for Sign-Off

In order to sign-off a line via feature access code, the line must have a PIN assigned.

- Create secondary line appearance(s) of some keyset line (3340).
- Create a PIN1 for the line (3340) via AMO PERSI.
- Sign-off the keyset line (3340) by selecting the prime line and entering the sign-off access code followed by the line's PIN1. Normal sign-off restrictions apply here including the restriction that the line does not possess the NORELOC attribute.

Now 3340 is a phantom line (it PEN has been removed). The remaining line appearances of 3340 are still in service. However, an Agent cannot logon the phantom line without first being blocked from performing autoset relocation or sign-on/sign-off (NORELOC).

- Mark the phantom line so that it cannot be signed-on/off.

```
CHA-SDAT:3340,ATTRIBUT,NORELOC;
```

If 3340 is not class marked as an Agent, this also must be done via AMO SDAT.

- Log an Agent onto line 3340. One way of doing this is by selecting the line, entering the logon access code and entering a valid, free Agent ID.

Now 3340 is a phantom ACD Agent.

12.1.2.3.2 Create a Phantom Agent Via AMOs Only

1) Create secondary line appearance(s) of some keyset line (3340).

- Sign-off the keyset line (3340) via AMO DSSU. Normal sign-off restrictions apply here including the restriction that the line does not possess the NORELOC attribute.

  ```
  CHA-DSSU:TYPE=SIGNOFF,STNO=3340;
  ```

- Mark the phantom line so that it cannot be signed-on/off.

  ```
  CHA-SDAT:STNO=3340,TYPE=ATTRIBUT,
  AATTR=NORELOC;
  ```

  If 3340 is not class marked as an Agent, this also must be done via AMO SDAT.

- Log an Agent onto line 3340 by selecting the line, entering the logon access code or pressing the AVAIL key, and entering a valid, free Agent ID.

  Now 3340 is a phantom ACD Agent.

IMPORTANT: A phantom/signed-off keyset line can also be created directly with AMO SBCSU by not assigning a PEN and setting INS=SIGNOFF.

12.1.2.4 Relevant AMOs

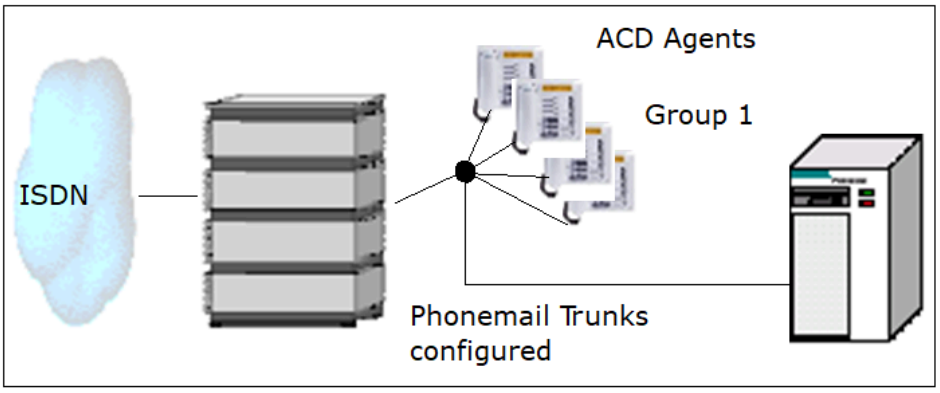
AMO	Parameter	Sprache/ Language	Beschreibung/Description
PERSI	PIN1	e	Create PIN for use when signing off keyset line manually
	PIN1	d	PIN für manuelles Abmelden der Keyset-Leitung erzeugen
SDAT	ATTRIBUT	e	Mark line as AGENT and NORELOC (prevents sign-on/sign-off)
	MERKMAL	d	Leitung als AGENT und KRELOC markieren (verhindert automatisches Anmelden/Abmelden)
DSSU	TYPE	e	Sign-off/Sign-on existing keyset line
	TYP	d	Vorhandene Keyset-Leitung abmelden/anmelden
SBCSU	INS	e	Create keyset (without PEN) as initially signed-off
	INBETR	d	Keyset (ohne LAGE) als abgemeldet erzeugen

12.1.3 PhoneMail Ports as Agents

12.1.3.1 Feature Description

This feature provides the ability to route ACD calls to PhoneMail Agent groups.

Properly configured PhoneMail trunk ports are treated as Agents and calls can be queued to their PhoneMail Agent group awaiting a free Agent/ trunk. PhoneMail Agents are always logged on and in available mode when their corresponding trunk port is in service i.e. the phonemail agents are automatically given the attribute auto logon without AMO configuration and are logged on after restart,reload when the trunk comes back into service.



12.1.3.2 User Interface

ACD calls can be routed to PhoneMail via a Route-to-Group ART step. The Agents in the ACD PhoneMail group are associated with a specific trunk port in an ACD PhoneMail trunk group. Routing and queuing to an ACD PhoneMail group is the same as for normal ACD groups. The only difference is that specific Agent selection is performed based on the ACD PhoneMail trunk selection algorithm rather than the ACD group's Agent selection algorithm.

The PhoneMail service access number used to route calls to the PhoneMail Agent group is configured with the ACD group. This number must first be defined in AMO RICHT. Upon successful completion of a route to a PhoneMail Agent, the calling party display will be updated to show the DNI number followed by the NAME configured in RICHT associated with the PhoneMail group's service access number.

IMPORTANT: If the PhoneMail service access number assigned to the Agent group is invalid, all attempts to route ACD calls to this PhoneMail Agent group will cause an error to be logged. Such failures cause ART processing to abandon further attempts to reach the PhoneMail Agent group for this call (i.e. no queuing to the group).

12.1.3.3 AMO Usage

Assume that an STMD2 board is already properly configured in slot 1-1-49 to connect to an Xpressions server. (Note that the S0 interface to PhoneMail is the only interface supported for ACD's "PhoneMail Ports as Agents" enhancement.) Also assume a valid COT (111) and COP (112) are already defined and the numbering plan used is open.

- If a PhoneMail service access number is not yet defined for routing calls to PhoneMail/Xpressions, one must be created. Create PhoneMail service access number 27441.

```
ADD-RICHT:MODE=PM,IDX=1,SAN=27441,NAME="ACD
PHONEMAIL ACCESS",STYPE=XPRESION;
```

- Create an ACD PhoneMail Agent group. Group 4 will be a PhoneMail ACD group with service access number 27441.

  ```
  ADD-ACDGP:ACDGRP=4,TYPE=PM,PMSAN=27441;
  ```

- Create an ACD PhoneMail trunk group. Trunk group 444 will contain only Agents/trunks for ACD group 4.

  ```
  ADD-BUEND:TGRP=444,NAME="ACD PM TRUNK GROUP",
  NO=30,RSV=N,TDDRFLAG=ON,GDTRRULE=0,ACDPMGRP=4;
  ```

- Create the ACD PhoneMail trunks and populate the ACD PhoneMail trunk group. (There is nothing special for ACD PhoneMail Agent trunks in this case; just the usual construction of digital trunks.) Each trunk must eventually become an Agent before being brought into service. PEN 1-1-49-0 will be added to ACD PhoneMail trunk group 444.

  ```
  ADD-TDCSU:OPT=NEW,PEN=1-1-49-0,COTNO=111,COPNO=112,
  DPLN=0,LCOSV=1,CCT="PM AGENT",PROTVAR=PSS1V2,
  SEGMENT=8,DEDSVC=NONE,TRTBL=GDTR,ATNTYP=TIE,TCHARG=N,
  SUPPRESS=0,TGRP=444,DEV=S0CONN;
  ```

  Repeat for each trunk circuit that will be an ACD PhoneMail Agent.

- Create a trunk route for ACD PhoneMail. (No special configuration for ACD PhoneMail.) LRoute 98 will route calls to ACD PhoneMail trunk group 444.

  ```
  ADD-RICHT:MODE=LRTENEW,LRTE=98,TGRP=444,
  NAME="ACD PM",DNNO=1-1-200,PDNNO=1-1-200;
  ```

- Create access code for reaching ACD PhoneMail. 27 will be the access code for ACD PhoneMail.

  ```
  ADD-WABE:CD=27,DAR=TIE;
  ```

- Make ACD PhoneMail access code lead to route pointing to ACD PhoneMail trunk group. Trunk access code 27 will take calls to route 98 and ACD PhoneMail trunk group 444.

  ```
  ADD-LDAT:LROUTE=98,LSVC=ALL,TGRP=444,ODR=2,
  LAUTH=1;

  ADD-LDPLN:LDP=27-X,LROUTE=98,LAUTH=1;
  ```

- Create the ACD PhoneMail Agents and populate the ACD PhoneMail group. Agent 41 will be an Agent in ACD PhoneMail group 4.

  ```
  ADD-AGENT:AGTID=41,AGTTYPE=PM,ACDGRP=4,AGTPOS=1,
  PEN=1-1-49-0,BCHAN=1;
  ```

  Repeat for each PhoneMail Agent/trunk to be added to the ACD PhoneMail group.

- Activate the ACD PhoneMail Agents/trunks. This can only be done once they are assigned a PEN in an ACD PhoneMail group.

  ```
  ACT-DSSU:ONTYPE=AUL,TYPE=PEN,PEN1=1-1-49-0,
  PEN2=1-1-49-7;
  ```

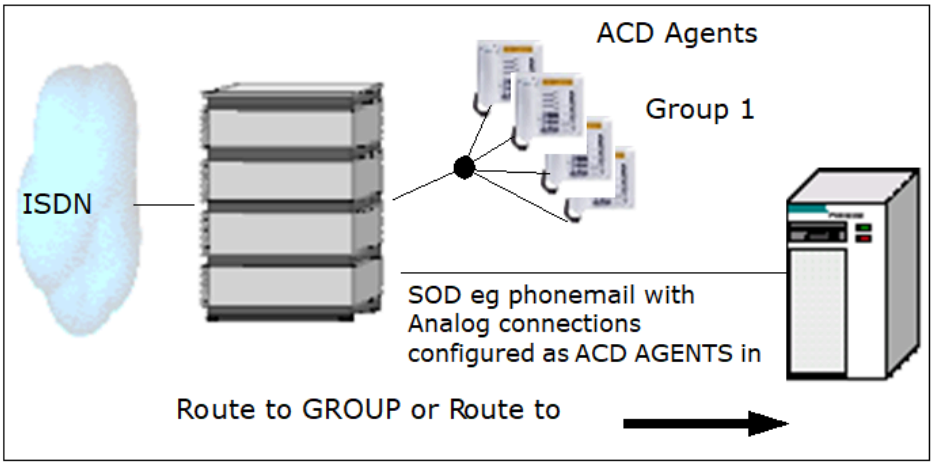
12.1.3.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
RICHT	MODE	e	Define an Lroute for the phonemail trunk group
	ART	d	LRTG für die PhoneMail-Bündelgruppe definieren
WABE	CD	e	Define PhoneMail service access number
	KZP	d	PhoneMail-Dienstkennzahl definieren
ACDGP	TYPE and PMSAN	e	Create ACD PhoneMail Agent group with service access number assigned
	TYP und PMSAN	d	ACD PhoneMail-Agentengruppe mit Dienstkennzahl anlegen
BUEND	ACDPMGRP	e	Link trunk group to ACD PhoneMail Agent group
	ACDPMGRP	d	Bündelgruppe mit ACD PhoneMail-Agentengrupppe verknüpfen
AGENT	PEN and BCHAN	e	PhoneMail Agents must be given the PEN and B-channel of the ACD PhoneMail trunk that they are associated with
	LAGE und BKANAL	d	Den PhoneMail-Agenten müssen die LAGE und der B-Kanal der ACD PhoneMail-Amtsleitung zugeordnet werden, zu der sie gehören

12.1.4 Special Outpulsing Devices (SODs) as Agents

12.1.4.1 Feature Description

A Special Outpulsing Device (SOD) is a specially configured analog device which is expected to receive DNIS digit information via inband digit signalling upon through-connection of an ACD call. The exact DNIS digit information outpulsed to an SOD is configurable on a system basis.



SODs can be configured as Agents. Because they are typically not normal Agent positions, they can activate indefinite work mode via a simple offhook-onhook sequence when configured as autologon Agents.

12.1.4.2 User Interface

An analog station, analog OPS, or T1 OPS is configured as an SOD in AMO SCSU. When an SOD answers an ACD call via a Route-to-Agent, Route-to-Group, or Route-to-Extension ART step, the internal and/or external DNIS number associated with the call is outpulsed to the SOD. The exact DNIS number(s) to outpulse is determined by system flag TYPEDNIS in AMO ZAND. Outpulsing of DNIS digits after the SOD answers begins after the time period (OHDELAY1) defined in AMO DTIM2.

SODs can be configured as autologon Agents. Such Agents enter indefinite work mode automatically when they go offhook and then onhook without dialing any digits. They must go offhook and enter the available mode access code to be routed to as an Agent again. This is required to prevent the ACD from routing calls to the SOD when it is unavailable e.g. when back-up operations are in place.

12.1.4.3 AMO Usage

12.1.4.3.1 Creation of SOD and Outpulsing Characteristics

Assume the analog station, analog OPS, or T1 OPS device that will become the SOD is already created as extension 2200. Configure 2200 as an SOD that will be outpulsed external DNIS information only beginning 1 second after through-connection of an ACD call.

- Assign 2200 as an SOD.
  `CHA-SCSU:STNO=2200,SPEC=SOD;`
- Set system flag to the type of DNIS information to be outpulsed after through-connection of an ACD call to an SOD. Set up so that only external DNIS digits (as received from external party) are outpulsed.
  `CHA-ZAND:TYPE=ALLDATA2,TYPEDNIS=EXTDNIS;`

- Set system timer for offhook delay to control interval after answer before outpulsing of DNIS begins. Set timer to 1000 milliseconds.
  `CHA-DTIM2:TYPEDH=GEN,OHDELAY1=1000;`

12.1.4.3.2 Creation of SOD as Autologon Agent for Special Work Mode Activation

There is no new, special configuration for this aspect of the feature enhancement. This is done automatically because the SOD simply must be an autologon Agent.Therefore when an agent is configured and it is a SOD then it will automaticaly log on.

The code for deactivating work mode must be configured in the device

12.1.4.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
SCSU	SPEC	e	Designate analog device as a Special Outpulsing Device
	SOND	d	Analoges Gerät als SOD bestimmen
ZAND	ALLDATA2	e	Configure the type of DNIS information (internal and/or external) to outpulse (TYPEDNIS)
	DATEN2	d	Art der DNIS-Informationen (intern und/oder extern) konfigurieren, die auszusenden sind (TYPDNIS)
DTIM2	GEN	e	Configure timer to delay outpulsing for an interval following connection to SOD (OHDELAY1)
	ALLG	d	Zeitüberwachung konfigurieren, um die Aussendung der DNIS nach Anschaltung einer Leitung an ein SOD um eine bestimmte Zeit zu verzögern (OHDELAY1)

12.1.5 Silent/Tone Monitoring of Non-Agent Targets

12.1.5.1 Feature Description

Silent/tone monitoring targets must not be classmarked as an Agent. Monitoring targets must only be classmarked as "Can Be Silent Monitored".

12.1.5.2 User Interface

There is no change to the user interface. The restriction that a monitoring target must be first classmarked as AGENT before being classmarked as CBSTMON has been removed. Only the CBSTMON classmark is necessary for monitoring.

No special configuration is necessary for this feature enhancement.

12.1.5.3 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
SDAT	ATTRIBUT	e	AGENT attribute is no longer a prerequisite for assigning the CBSTMON attribute
	MERKMAL	d	Das Attribut AGENT ist keine Voraussetzung mehr, um das CBSTMON-Attribut zuordnen zu können

12.1.6 Consultation Calls from Conference into ACD

12.1.6.1 Feature Description

Any station that can consult away from a conference is allowed to consult away from a conference to an ACD number/destination.

12.1.6.2 User Interface

There is no special user interface for this feature enhancement.

No special configuration is necessary for this feature enhancement and no Amos are required.

12.1.7 Honoring of Call Forwarding for ACD Routes Offsite

12.1.7.1 Feature Description

ACD routes to offsite (outside the ACD node) destinations will be forwarded according to the forwarding rules of the destination station.

There is no special user interface for this feature enhancement and no configuration or AMO.

12.1.8 Automatic Call Acceptance (ACD Zip Tone)

12.1.8.1 Feature Description

This feature allows you to configure a toggle button on the ACD agent telephone that allows the agent to set their telephone to automatically answer inbound telephone calls.

When the button is pressed, the lamp comes on indicating that the feature is enabled. When the button is pressed again, the lamp turns off.

If the feature is engaged and the lamp is on, and a call is delivered to the agent by ACD call processing, a short burst of tone, or "zip" tone, is heard in the headset the agent is using, and the caller is automatically answered and connected to the agent. The call is terminated when the caller hangs up or the agent presses the line key or the release key.

When the feature is not engaged and the lamp is off, the telephone call must be answered by the agent manually by pressing the line key.

12.1.8.2 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
TAPRO	AUTOM	e	Automatic Call Acceptance
	AUTOM	d	Automatische Gesprächsannahme

12.1.9 Personal Call Notification (AICS for ACD calls only)

12.1.9.1 Feature Description

Automatic Call Pickup will be available for telephones configured with ACD functionality.

There are 2 scenarios:

Agent is logged on and available

- **AICS** is activated
  - The agent receives ACD calls. In this case nothing is changed: the agent automatically hears the AICS zip tone and then gets connected to the caller, or the agent automatically hears the **AUDSRCID** if activated, then the zip tone and then gets connected to the caller.
  - The agent receives personal calls. In this case the agent hears a personal announcement if activated (see below Â¡V user interface), similar to AUDSRCID, then the zip tone and then gets connected to the caller.

- **AICS** is not activated
  - The agent receives ACD calls. In this case nothing is changed: the agent station rings. When the agent answers it gets connected to the caller or it hears the AUDSRCID if activated and then gets connected to the caller.
  - The agent receives personal calls. The agent station rings. When the agent answers it hears a personal announcement if activated (see below Â¡V user interface), similar to **AUDSRCID**, then it gets connected to the caller.

  Agent is logged off, or not available

  AICS activated/not activated:
- The agent cannot receive ACD calls.
- The agent receives calls on his private line. In this case AICS has no effect, the station rings and the agent uses the handset to answer the call. No announcement starts.

12.1.9.2 Service Information

- It is important to note that RECNUM 206 should be used in the future for this feature only! Therefore **RECNUM=206** cannot be used for other announcements any more.
- In case of a keyset station the activation and deactivation of the **AICS** must be made with the HS button instead of the **AICS** parameter from AMO KCSU.

12.1.9.3 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
KCSU	AICS	e	Automatic incoming call signalling on headset AICS=YES: Incoming call automatically collected. AICS=NO: Incoming call must be manually collected.
	AUTOANT	d	Automatisches Antworten bei Kopfsprechgarnitur AUTOANT=JA: Gespräch wird automatisch entgegengenommen. AUTOANT=NEIN: Gespräch muss manuell entgegengenommen werden.

12.1.10 Display the A Number at the Agent

12.1.10.1 Feature Description

The displays for calling and called parties in an ACD scenario follows the following implementation rules:

Once an internal DNIS number was identified by the system, it is retained throughout the life of the call unless it is overwritten.

During the life of a call, the DNIS information may be overwritten one or more times by new DNIS information. This can occur each time a call is transferred, extended or ACD routed to a number which is identified as a DNIS number.

The initial DNIS information for a call is not the first DNIS information produced when DNIS information is produced more than once, e.g. due to multiple ACD routings. The displays will be updated using the actual DNIS information which is saved as redirecting data in call buffer.

In the described scenario, the calling party will be updated accordingly with the actual DNIS number.

When agents' numbers are not suppressed (**SUPAGTNU=NO** in AMO ZAND), the calling party display will be updated with agent's informations (number and/ or name).

The functionality of the CR:

With the implementation of this CR the displays for calling and calles parties in an ACD scenario follows the following rules:

In case of an ACD call on the display of the calling party only the called ACD number (DNIT number) can be seen.

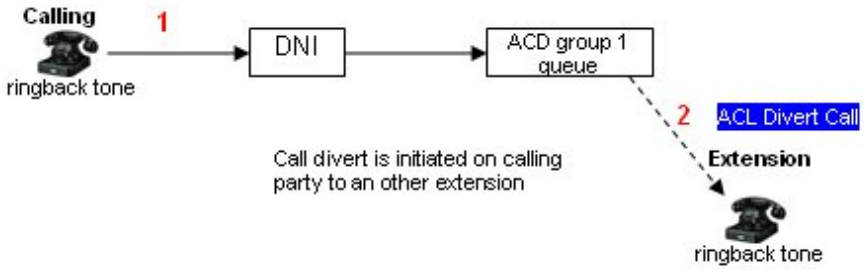
This feature prevents to show the numbers of the agents and also other routed or diverted devices on the calling party display.

If this feature is activated the already existing ACD display feature "suppress agent number" has no influence for the calling party display.

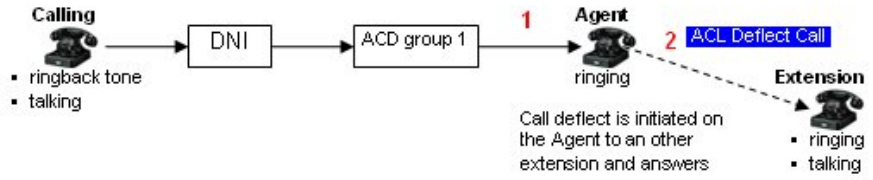
In the following Section 162.10.2, "Scenarios" the scenarios where this feature is working are described.

12.1.10.2 Scenarios

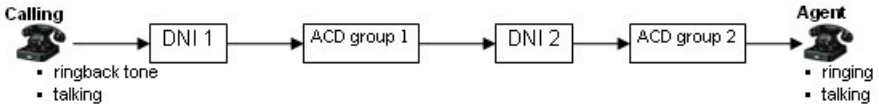
1) The calling party is diverted from the ACD's queue:



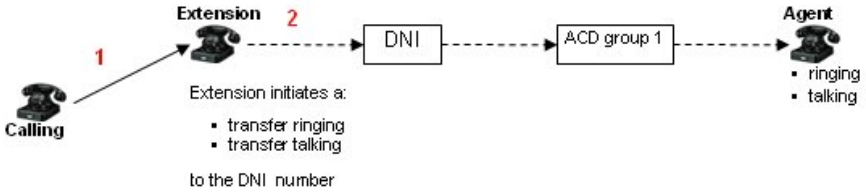
2) The ringing call is deflected from the agent



3) The calling party is routed to a second DNI number (DNI 1 will be displayed on the calling)



4) The Calling party is transferred to an ACD by an extension



At the call connection the display of the calling party shows the (first) DNI number.

12.1.10.3 Activation

The above described feature can be activated with the following AMO command:

```
CHANGE-ZANDE:TYPE=ACD, ORIGDNI =YES;
 AENDERN-ZANDE:TYP=ACD,ORIGDNI=JA;
```

12.1.11 Ringback Tone for Diverted Call to analog CallDirector

12.1.11.1 Feature Description

It is possible to eliminate the ringback tone for a calling party if the application divert a call from ACD queue to an anlaog CallDirector port and the calling party was routed in the ACD to a music or an announcement.

12.1.11.2 Service Information

Prerequisites

- AMO ZAND RESERVE parameter 186 is activated.
- Calling party is in ACD queue and hears music or announcement.

- Application activated a CSTA deflect (ACL Diver Call) request for calling party CallDirector port.
- The destination of CSTA Deflect (ACL Diver Call) Request is an analog CallDirector port.
- Destination CallDirector has an activated AGENT flag in AMO SDAT.

User interface:

Calling party will not hear ringback tone when the application divert the call from ACD music or announcement to the Call Director port.

calling party

Possible calling party devices:

- internal digital phone
- internal analog phone
- internal functional device
- external call via digital trunk (CO or TIE trk.)

12.1.11.3 Generation (Example)

- Activation of the feature
  `CHANGE-ZANDE:TYPE=ACL,DIVCRDIR=YES;`
- Analog CallDirector

```
ADD-SCSU:STNO=5300,PEN=1-2-91-0,DVCFIG=ANATE,
DPLN=0,ITR=0,COS1=50,COS2=50,LCOSV1=1,LCOSV2=1,
LCOSD1=1,LCOSD2=1,COSX=0,SPDI=0,COFIDX=0,SPEC=SUFDIAL,
DIAL=VAR,DHPAR=DTMFST,INS=YES,SSTNO=NO,HMUSIC=0,
CONN=DIR,FLASH=YES,DTMFBLK=NO,PMIDX=0;
```

- **AGENT** flag for CallDirector

```
CHANGE-SDAT:STNO=5300,TYPE=ATTRIBUT,AATTR=AGENT;
```

12.1.11.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
SCSU	GERKON=ANATE	d	CallDirector muss als Anate konfiguriert sein.
	DVCFIG=ANATE	e	CallDirector must be configured as Anate.
SDAT	EMERK=AGENT	d	CallDirector muss ein aktiviertes AGENT-Flag haben.
	AATTR=AGENT	e	CallDirector must have an activated AGENT flag.
ZANDE	DIVCRDIR=JA	d	Aktivierung des Leistungsmerkmals mit DIVCRDIR im Zweig ACL.

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	DIVCRDIR=YES	e	Activation of the feature with DIVCRDIR in branch ACL.

12.1.12 Divert Call Request Support of Reroute Internal

12.1.12.1 Divert Call Requests if the Destination is a Trunk with Reroute Internal

12.1.12.1.1 Feature Description

ACD routes queued calls internally (to internal stations called agents) or externally (destinations are trunks). There are cases when a trunk is configured with **RERTEINT** (Reroute Internal) attribute in AMO LDAT. ACD is able to execute routings to **RERTEINT** destinations.

Use Cases

Use Cases for ACD with route to a destination on a trunk with **RERTEINT**.

The feature takes care of two cases:

1) ACD has configured a **RTOFF** step to a destination on a trunk with **RERTEINT**.
2) An application which monitors ACD queues, diverts the call to a destination on a trunk with **RERTEINT**.

For a configuration with

- 200 as trunk access code,
- 200-x the LDPLN entry,
- **RERTEINT** in corresponding AMO LDAT,
- 3400 internal station,
- 3500 external station (configured with closed numbering),
- 9663500 trunk access code for open numbering and external station 3500

the following scenarios are implemented:

1) A call to ACD is queued

ACD has configured a step RTOFF 2003400

ACD executes this step

Call is routed internally to stn 3400

2) A call to ACD is queued

ACD has configured a step RTOFF 2003500

ACD executes this step

Call is routed externally to 3500

3) A call to ACD is queued

   ACD has configured a step RTOFF 2009663500

   ACD executes this step

   Call is routed externally to 9663500

4) A call to ACD is queued

   Application invokes DIVERT to destination 2003400

   ACD executes this step

   Call is routed internally to stn 3400

5) A call to ACD is queued

   Application invokes DIVERT to destination 2003500

   ACD executes this step

   Call is routed externally to 3500

6) A call to ACD is queued

   Application invokes DIVERT to destination 2009663500

   ACD executes this step

   Call is routed externally to 9663500

12.1.12.1.2 Service Information

The solution applies also for routings to agents which are forwarded to **RERTEINT** destinations (to enable execution of forward for agents, set AMO ACDSD, **AGTFWD=YES**).

No AMO configuration is necessary to activate this feature.

12.1.12.2 ACL Set Forward Command Support for Reroute Internal

12.1.12.2.1 Feature Description

ACL set FWD has been enhanced to apply LCR reroute internal functionality to determine the redirection number and to determine the redirection name from the redirection number after LCR logic has been applied. The redirection name is presented on forwarded station display instead of trunk name.

This means that in case of ACL set forward to external destinations, the trunk name is determined and presented on forwarded station display next to redirection number.

Use Cases

Use Cases for ACL set forward command for reroute internal:

For a configuration with

- 200 as trunk access code
- 200-x the LDPLN entry
- **RERTEINT** in corresponding LDAT
- trunk name "NETWORK" in corresponding RICHT
- 3400 internal station with name "JOE SMITH"
- 3480 internal DNIT number, with DNI display "ACD ROUTING"
- 3500 external station (configured with closed numbering)

- 9663500 trunk access code for open numbering and external station 3500

the following scenarios are implemented:

1) ACL set FWD for 3412 to 2003480

display of 3412 shows: "Forwarding to 2003400 ACD ROUTING"

2) ACL set FWD for 3412 to 2003400

display of 3412 shows: "Forwarding to 2003400 JOE SMITH"

3) ACL set FWD for 3412 to 2003500

display of 3412 shows: "Forwarding to 2003500 NETWORK"

4) ACL set FWD for 3412 to 2009663500

display of 3412 shows: "Forwarding to 2009663500 NETWORK2

12.1.12.2.2 Service Information

- The redirection number determined after LCR reroute internal processing is not validated by ACL (parameters **CFVA** in AMO COT or AMO ZAND parameter **NOCFW** are ignored).
- The name of the redirection number after **RERTEINT** processing is determined identically in ACL as in not-**RERTEINT** scenarios, when internal redirection number is used in ACL set FWD command.
- If no name is configured for redirection number, then the name misses on forwarded station display.
- ACL is not clever enough to determine hunt group names, therefore:
  - if redirection number is pilot hunt group, trunk name is used
  - if redirection number is master hunt group, name of master station is used
- If **RERTEINT** processing fails or redirection number is not valid, trunk name is used
- No AMO configuration necessary to activate this feature.

Restricions:

For this CR to work, there's a limit of maximum 4 accepted trunk access codes used simultaneously for a destination number.

In other words it means the following:

For a configuration:

- 3400 internal station with name "JOE SMITH"
- 51 as trunk access code
- 51-x the AMO LDPLN entry
- **RERTEINT** in corresponding AMO LDAT
- 52 as trunk access code
- 52-x the AMO LDPLN entry
- **RERTEINT** in corresponding AMO LDAT
- 53 as trunk access code
- 53-x the AMO LDPLN entry
- **RERTEINT** in corresponding AMO LDAT
- 54 as trunk access code
- 54-x the LDPLN entry
- **RERTEINT** in corresponding AMO LDAT
- 55 as trunk access code
- 55-x the AMO LDPLN entry

- **RERTEINT** in corresponding AMO LDAT
- trunk name "NETWORK" in corresponding AMO RICHT

the expected results are the following:

1) ACL set FWD for 3412 to 515253543400

display of 3412 shows: "Forwarding to 515253543400 JOE SMITH2

2) ACL set FWD for 3412 to 51525354553400

display of 3412 shows: "Forwarding to 515253543400 NETWORK"

3) DIVERT or **RTOFF** of ACD queued call to 515253543400

call is routed internally to 3400

4) DIVERT or **RTOFF** of ACD queued call to 51525354553400

routing is rejected, the call remains in ACD queue

12.1.13 Application Populated Caller ID (APCID)

The caller identification set by applications using ACL Make Call Request is called **Application Populated Caller ID (APCID)** and has two parts - number and name.

Call Center customers want to send out (internally and externally) the agent's CLIP (e.g. Service Number) according to the task he is involved in. For example, a Call Center handles calls for different customers (brands) and the agents have to callback to the clients. They want to show the customers (brands) service number.

12.1.13.1 Feature Description

The implementation is based on the two information elements **NumberToDisplay** and **NameToDisplay** that are part of the ACL MakeCallRequest.

NumberToDisplay and **NameToDisplay** overrides the existing number and name configured or active (e.g. via PIN) on the physical device used to initiate the call.

The feature has been implemented from the calling party perspective for:

- analog phones
- digital phones,
- Keysets,
- HFA IP phones.

12.1.13.2 Service Information

Rules

1) Application provides only **NumberToDisplay** (no **NameToDisplay**). In this case **NameToDisplay** can be determined in 3 possible ways:

- If **NumberToDisplay** is configured as station in the system then its PERSI name will be provided as **NameToDisplay**. If this station has no PERSI, then **NameToDisplay** is empty.
- If PIN is entered on physical device, then PIN name will be provided as **NameToDisplay**. If PIN data contains no name, then **NameToDisplay** is empty.
- Otherwise PERSI name of physical device will be provided. If physical device has no PERSI, then **NameToDisplay** is empty.

Application provides only **NameToDisplay** (no **NumberToDisplay**). In this case the number can be determined in 2 possible ways:

- If PIN is entered on physical device, then PIN number is provided.
- Otherwise physical device number is provided.

2) If physical device has PIN entered, it is preserved and restored after the call is terminated.

3) In the called party's Call Log, **NumberToDisplay** and **NameToDisplay** are saved. If this number is called back, it might happen that the call fails. The call will be established only if **NumberToDisplay** is configured in the system. The same happens in case of call back scenarios.

4) If the physical station has restricted number and/or name (i.e. it is secret station, **SSTNO=YES** in AMO SBCSU), the presentation of **NumberToDisplay** and **NameToDisplay** will not be restricted. The presentation will be kept as configured if one of the two parameters misses and is determined as described above (see 1 and 2).

5) To enable APCID feature for outgoing CO calls, the CO trunks must be configured with **VNCO** (send **V**irtual Subscriber **N**umber to **CO**) in AMO COT. If **VNCO** is not set, the identity of the physical station will be sent to the CO partner.

6) If physical station has **PUBNUM** or **PUBNAME** set, they are ignored. **NumberToDisplay** and **NameToDisplay** will be sent to CO partner.

7) To enable APCID feature for call forward scenarios over network, parameters **FWDN** and/or **FNAN** have to be set in AMO COT of the involved trunks.

8) It is the application's responsibilty to use this feature as law enacted. Sending out a legal number and name than the real calling party's identity to a public network is always the responsibility of the initiator of the call.

9) If a call is initiated for a station with **NumberToDisplay** and **NameToDisplay**, they will be presented as long as the station is not idle. It means that the application populated caller id information will not change if the station invokes any of the following features:

- HOLD - if the agent puts its partner on hold and consults, Application Populated Caller ID information is used for the consultation call.
- RETRIEVE - Application Populated Caller ID information is presented to the partners, since MakeCall call has not terminated and agent didn't go to idle.
- CONSULT - same as HOLD

- RECONNECT - Application Populated Caller ID information is presented to the partners, since MakeCall call has not terminated and agent didn't go to idle. TRANSFER - there are three cases for TRANSFER
  - agent is transferred to a new partner - the new partner will see Application Populated Caller ID since MakeCall call has not terminated and agent didn't go to idle.
  - agent transfers a CO call to agent 2 - the CO partner is connected to agent 2 and sees the the original Application Populated Caller ID, even if MakeCall call has terminated and agent went to idle (the CO trunks must be configured with VNCO in COT).
  - agent transfers a TIE or internal call to agent 2 - agent 2 identity is presented to the TIE or internal partner. Application Populated Caller ID is deleted because MakeCall call has terminated and agent went to idle.
- CONFERENCE - Application Populated Caller ID is still presented to the partners, since MakeCall call has not terminated and agent didn't go to idle.
- SINGLE STEP TRANSFER - same as TRANSFER (see TRANSFER - there are three cases for TRANSFER)
- ALTERNATE - agent toggles from active to held call and always Application Populated Caller ID is presented

12.1.13.3 Generation (Example)

The feature does not need any configuration to activate, due to working with additional optional parameters in an existing ACL Make Call service.

12.1.14 Displaying the ACD Pilot Number and Name for Outgoing System-Internal Calls

ACD pilot number and name of an logged on agent who initiates an internal call can be configured and displayed.

12.1.14.1 Feature Description

If an agent is part of a group for which a configuration with pilot number and name exists (**GRPPN** and **GRPNAME** in AMO ACDGP), and the agent makes a call towards another subscriber, the pilot number and name will be displayed at the called side. These data will remain valid until the agent becomes idle, regardless if the agent has logged off in the mean time or gets involved in various scenarios.

NOTICE: This feature is supported for phones display only. Pilot Number and Name act as a PIN for the agent. PIN feature is not supported on CSTA interface, therefore ACD Pilot Number and Name are not propagated via CSTA to applications. Original agent number and name will be presented instead.

The **ACD Group Pilot Number** (**GRPPN**) is a number per ACD group which fully replace the agent's number when an agent places a call. It must be a configured number in AMO ACDGP which can be called back. The ACD group pilot number can be assigned to one or more groups of agents.

The **ACD Group Name** (**GRPNAME**) is a text per ACD group which fully replaces the agent's name when an agent places an internal call (configurable in AMO ACDGP).

If the name and number of the ACD group should not be presented, then the corresponding fields in AMO ACDGP must be empty.

12.1.14.2 Service Information

- If the agent's station is secret, the new caller ID will not be secret.
- If the agent's call is initiated by an application which sets calling name and number (see Section 162.13, "Application Populated Caller ID (APCID)"), then ACD group pilot number and ACD group name will be ignored.
- The ACD Pilot Group Number will be a configured directory number with AMO DNIT. It must be a number which can be called directly. An ACD Pilot Group Number can be assigned to one or more groups of agents. A group of agents can have a Pilot Number if desired. A group of agents can have a Group Name if desired.

  In the called party's Call Log, the caller ID is saved. When the directory number is called back, the DNI processing will be executed, as configured by AMO DNIT.

  Caller ID is made of two parts, number and name. The number is in this case the Pilot Number. The name is a configured name per ACD group.
- Pilot Number will be used for all types of calls (internal or external). If parameter **PUBNUM** is set in AMO SDAT, it will be set for external calls and will overwrite ACD Group Pilot Number.
- If an ACD group is configured im AMO ACDGP only with the Pilot Number (no Group Name), then the Group Name will be taken from AMO DNIT.

  If the Pilot Number has **DISPLAY** parameter set, then it will be used as Group Name.

  If the Pilot Number has no **DISPLAY** set, then the Group Name will be empty.
- If an ACD group is configured only with the Group Name (no Pilot Number), then the Pilot Number will be determined in two possible ways:
  - If PIN is entered on agent's station, then PIN user number is provided.
  - Otherwise agent's physical station number is provided.
- If a call is initiated by an agent with Pilot Number (**GRPPN**) and Group Name (**GRPNAME**) as agent's ID, they will be displayed as long as the station is not idle. It means that the agent's ID will not change if the station invokes any of the following features:
  - Hold - if the agent puts its partner on hold and consults, **GRPPN** and **GRPNAME** are used for the consultation call.
  - Retrieve - **GRPPN** and **GRPNAME** are presented to the partners, since agent's call has not terminated and agent didn't go to idle.
  - Consult - same as hold

- Reconnect - **GRPPN** and **GRPNAME** are presented to the partners, since agent's call has not terminated and agent didn't go to idle.
- Transfer - there are three cases for TRANSFER:
  - Agent is transferred to a new partner - the new partner will see **GRPPN** and **GRPNAME** since agent's call has not terminated and agent didn't go to idle.
  - Agent transfers a CO call to agent 2 - the CO partner is connected to agent 2 and sees the the original **GRPPN** and **GRPNAME**, even if agent's call has terminated and agent went to idle (the CO trunks must be configured with **VNCO** in AMO COT).
  - Agent transfers a TIE or internal call to agent 2 - agent 2 identity is presented to the TIE or internal partner. **GRPPN** and **GRPNAME** are deleted because agent's call has terminated and agent went to idle.
- Conference - GRPPN and GRPNAME are still presented to the partners, since agent's call has not terminated and agent didn't go to idle.
- Single Step Transfer - same as TRANSFER
- Alternate - agent toggles from active to held call and always GRPPN and GRPNAME are presented

12.1.14.3 Generation (Example)

ACD Group Pilot Number and Group Name must be configured in AMO ACDGP with the parameters **GRPPN** and **GRPNAME**.

Directory Number set as ACD Group Pilot number must be configured in AMO DNIT with **ROUTING=DRTD** or **ROUTING=DRTDSA**.

12.1.14.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
ACDGP	GRPPN	d	GRUPPE PILOT NUMMER
	GRPPN	e	GROUP PILOT NUMBER
	GRPNAME	d	GRUPPENNAME
	GRPNAME	e	GROUP NAME
DNIT	ANZEIGE	d	ANZEIGETEXT ANZEIGETEXT wird nur ausgewertet, wenn der Parameter **GRPNAME** im AMO ACDGP nicht gesetzt ist. ANZEIGETEXT gesetzt: Der Inhalt von ANZEIGETEXT wird als Gruppenname verwendet. ANZEIGETEXT nicht gesetzt: Gruppenname ist leer.

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	DISPLAY	e	DISPLAY only will be evaluated if parameter **GRPNAME** in AMO ACDGP is not sett! DISPLAY set: Content of DIPLAY is used as Group Name, DISPLAY not set: Group Name is empty.

12.1.15 DNIT Number Presentation

12.1.15.1 Feature Description

If a call that was routed by ACD has reached a Call Director and this call is transferred by the Call Director to an agent which is logged on and available, then the original caller sees on the display the DNIT number which was originally dialed, instead of seeing the agent's number.

The transfer can be either made by ACL commands SingleStepTransfer or Consultation and Transfer, or it can be executed as Transfer ringing or Transfer talking.

The calling station can be any station, and the Call Director can also be an analog port.

Scenario

A station dials a DNIT number, which is routed via ACD to a group of agents.

If none of the agents are free, then the call is routed to a Call Director.

The caller sees on the display the DNIT number.

The call is held for as long as there is no free agent.

As soon as an agent becomes free (still logged on and available), the Call Director transfers the held call to a free agent.

After the transfer is executed and the agent's station is ringing, the caller will still see the DNIT number, even after the agent has answered.

12.1.15.2 Service Information

- If the agent is forwarded CFU to another destination, then the same behaviour as in case of an ACD call will be kept: If AGTFWD is set to YES, then the forwarding will be executed when the CallDirector calls this agent, otherwise the agent will ring. If the type of forwarding is not unconditional, but Call Forward No Reply or Call Forward busy, then the call from the Call Director will be redirected.

- If the agent is a Hunt Group master or member in a Pick-up group, then the functionality is the same: after the call is transferred and answered, the calling station will have the DNIT number on the display.
- It is possible to assign virtual nodes (defined with KNDEF) to internal routing directory number (ACD=YES branch) in order to ensure correct number modification in complex E164 numbering environments.

12.1.15.3 Generation (Example)

Prerequisite

The agent must be logged on and available.

Configuration:

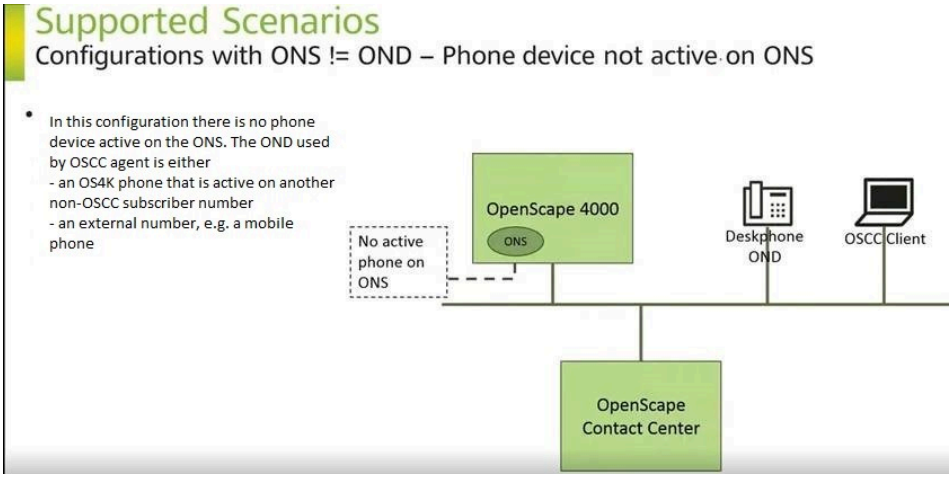
- Parameter **SUPAGTNU** is set to **YES** in AMO ZAND branch **ACD**.
  `CHANGE-ZAND:TYPE=ACD,SUPAGTNU=YES;`
- The Call Director has to be flagged as **CALLDIR** in AMO SDAT.
- The behavior in case of a forwarding set for the agent's station is controlled by the **AGTFWD** parameter from AMO ACDSD.

12.1.16 Virtual Agents

12.1.16.1 Feature description

This feature provides the ability to integrate external employees into the call distribution from OpenScape Contact Center V10, so that a terminal device does not have to be provided at the OpenScape 4000 for each external employee. A login at a virtual extension (extension without physical terminal device) is possible. The external employee logs on to the virtual extension with Agent Portal Web and activates his or her external phone number as preferred device.

That means that an OSCC user (agent ONS) can use the OSCC Preferred Device (static OND) with OpenScape 4000 in such a way that there is no physical device on the ONS. That means there's only a device achievable on the OND but no device active on the ONS.



12.1.16.2 Static OND

Static OND is a feature used by OpenScape Contact Center and allows integration between OpenScape Contact Center and OpenScape UC.

OND (preferred device) feature is an UC feature. If UC monitors the user's extension (ONS) and the user has set a preferred device (OND), than UC takes over the call to ONS and routes it to OND. This is done using ONS|OND binding mechanism. That means if an OND is used, all the monitoring events are reported with binding information ONS|OND, meaning the monitoring events are for the user (ONS), but generated by preferred device the user is active on (OND).

The term "static OND" was introduced to allow ONS|OND mechanism for an OSCC agent who sets her or his own preferred device, with no interference from UC. That means once the Static OND is set by OSCC for an agent, the call to agent is not "offered" to UC and UC does not invoke regular routing on this call. When Static OND device is set, OS4K routes itself the call to Static OND device. Advanced routing rules configured in UC are not active. If the call is not answered at the preferred device within a certain time, it is expected that the call will be moved back to the queue by OSCC in order to be assigned to another agent.

12.1.16.3 Virtual Agent Station

Virtual Agent Station is a new virtual station which is based on existing SCSU device AUXDIGI/ACLSTN. The new station can be configured with SCSU as device AUXDIGI/VIRTAGT (new value VIRTAGT for param INS)

Example:

```
ADD-SCSU:STNO=15281,DVCFIG=AUXDIGI,DPLN=0,ITR=0,
COS1=30,COS2=30,LCOSV1=1,LCOSV2=1,LCOSD1=1,LCOSD2=1,
COSX=0,SPDI=0,TEXTSEL=ENGLISH,INS=VIRTAGT,SSTNO=NO,
HMUSIC=0,PMIDX=0;

DIS-SCSU:15281;
```

```
H500: AMO SCSU STARTED
------------------------------ USER DATA ---------------------------------
STNO =15281 COS1 =30 DPLN =0 SPDI =0
PEN = COS2 =30 ITR =0 SPDC1 =
DVCFIG =AUXDIGI LCOSV1 =1 COSX =0 SPDC2 =
INS =VIRTAGT LCOSV2 =1 RCBKB =NO
PMIDX =0 ALARMNO =0 LCOSD1 =1 HMUSIC =0 RCBKNA =NO
SSTNO =NO COTRACE =NO LCOSD2 =1 SPEC =
COFIDX = DIAL = PULSTYPE= PULSLEV=
CCTIDX = ACKST = TEXTSEL=ENGLISH
DHPAR = NEONMWI=
CONN = FLASH = DTMFBLK = WITKEY :NO
------------------- ACTIVATION IDENTIFIERS FOR FEATURES --------------------
DND :NO CWT :NO
HTOS :NO HTOF :NO HTOD :NO VCP :YES
--------------------- FEATURES AND GROUP MEMBERSHIPS -----------------------
PUGR : HUNTING GROUP : NO
NIGHT OPTION : NO
------------------------ STATION ATTRIBUTES (AMO SDAT) ---------------------
--------------------------------------------------------------------------
```

The new VIRTAGT station added with SCSU consumes a license.

For the new VIRTAGT station only AGENT attribute can be set from ACD attributes list with AMO SDAT.

12.1.16.4 Agent features for Virtual Agent Station

OpenScape 4000 allows logon of an AGENT on the virtual agent station, but rejects the request to set AVAILABLE mode for the agent if Static OND is not set. If Static OND is set, the agent can become available. Only the combination of virtual station and Static OND allows ACD features to be available for an AGENT without a physical device.

If these conditions are met, then Virtual Agent with Static OND behaves as a classic Agent with Static OND.

12.1.16.5 Restrictions

In order to avoid miss-usages, some restrictions were introduced:

- For Virtual Agent station AMO SDAT allows only AGENT attribute to be set from ACD attributes set. Error F80 is generated if other ACD attribute is set.

  Example:

  F80: 15281 AUTOLOG IS NOT ALLOWED FOR SCSU DEVICE AUXDIGI

  VIRTUAL AGENT

- AMO SDAT rejects deletion of STAOND or AGENT attribute if an AGENT is already logged on virtual agent station. Error F79 is generated:

  F79: STAOND ATTRIBUTE CANNOT BE DELETED, BECAUSE VIRTUAL AGENT

  IS STILL LOGGED ON

  F79: AGENT ATTRIBUTE CANNOT BE DELETED, BECAUSE VIRTUAL AGENT

  IS STILL LOGGED ON
- ACL rejects deletion of Static OND data, via CSTA Set Forward Request, if an AGENT is already logged and available

  AckCode = improperCallState

12.2 Flexrouting

12.2.1 Feature Description

12.2.1.1 The fundamental routing functions of the ACD package are:

- Incoming call processing.
- Flexible ACD routing.
- Queuing unanswered calls if no agent is free.
- Queuing free agents to answer the next incoming ACD calls.
- Playing music or announcements in an ACD connection while searching for a free agent.
- Assigning to agent groups on recognition of agent logon.
- Special features for operating terminals to support the agent's work with specific ACD function keys and ACD displays (for example, LEDs for queued calls, ACD status display).
- Additional functions to support the operator console when monitoring ACD groups and various control tasks (for example, controlling the agent features).
- Generating a complete ACD event stream (ACL messages) to support CCMS functions (new: ACDAPP).

12.2.1.2 Server Functions

- The ACDAPP can operate as an application server with functions for generating reports and statistics.
- The ACDAP supports various management functions with a range of reports and statistics which can be implemented by the ACD administrator and ACD operator console to monitor ACD agent and ACD system performance.
- An ALAN is used for the connection to the OpenScape 4000. The new ACL-C link developed is used as a data interface.

12.2.1.3 The following is a short description of the features

ACD features for flexible routing and queuing:

- ACD flexible routing
- ACD look-ahead routing
- ACD day and night service
- Queuing available agents
- Queuing incoming calls
- End-of-shift routing (work schedule table)
- Calendar routing (day and year table)

Features for ACD agents:

- Logon/logoff code
- Mandatory ACD logon
- Automatic logon
- ACD agent mode and status
- Agent autowork
- LED display for agent modes
- LED display for queued ACD calls
- ACD folder status display
- Billing code entry
- Call duration display

Features for the ACD operator console:

- Control of AGT Features (CAF)
- ACD group status display
- Monitoring/silent monitoring

Features for ACD call processing:

- Shared DID lines (threshold value control) --> AMO BUEND
- Automatic incoming call signaling (AICS)

Announcement texts:

- ACD announcement texts
- ACD music
- Acoustic caller identification

ACD messaging services:

- Short message service
- Emergency message service

Features for source/destination-based routing:

- Destination-based routing
- ACD call destination display
- Source-based routing
- ACD call source display (visual source recognition)

ACDCQ features:

- ACL protocol implementations

12.2.2 User Interface

A call can be held in up to sixteen call waiting queues. If more than sixteen destinations are specified for this call, these are only connected when a destination becomes free. If a call is routed to a free agent who does not reply, the agent's status is set to UNAVAILABLE (call distribution disabled) as soon as the FNA timer expires (after 20 s). The call is then lost.

12.2.3 Service Information

- Flexrouting can also be operated without a server.
- Flexrouting is assigned a DPLN group with the AMO ZAND. This means that callers can also reach the destinations they require by calling the appropriate DPLN.
- The LCR classes of service that are forwarded by the flexrouting feature when setting up a call belong to the A-station. The LCOSs associated with trunks are used for stations that do not forward an LCOS.
- Terminals with key module should be used in preference.
- A SUPERVISOR/AGENT must not be a member of a CHESE (SECR) as this would nullify its flexrouting functions.
- ART 1 (ACD routing table) cannot be modified in the AMO ACDRT. ARTs 2-15 can only be modified with the master password. Standards should be defined in these ARTs for emergency operation. They can only be modified in the SET branch at the operating terminal. The other ARTs can be modified with a level-2 password at the operating terminal and the agents.
- The Silent Monitoring parameter in the AMO ZAND allows authorized users to override calls at authorized extensions. The send route is deactivated here.
- An external VMS must be entered as a destination with the following syntax: VMOWN ACD mailbox
- The attendant console operator can dial ACD numbers directly.
- The attendant console operator can initiate consultation calls with ACD numbers.
- The CASTMON function in the AMO SDAT can now be configured for analog terminals.
- There are now only four possible slots for the DMP5L Q2271-X board.
- GDTR rules for routing based on outgoing numbers is now available for up to 22 digits (formerly only sixteen).

- SMTIMER: Timer for delayed activation of silent/tone monitoring can be configured.

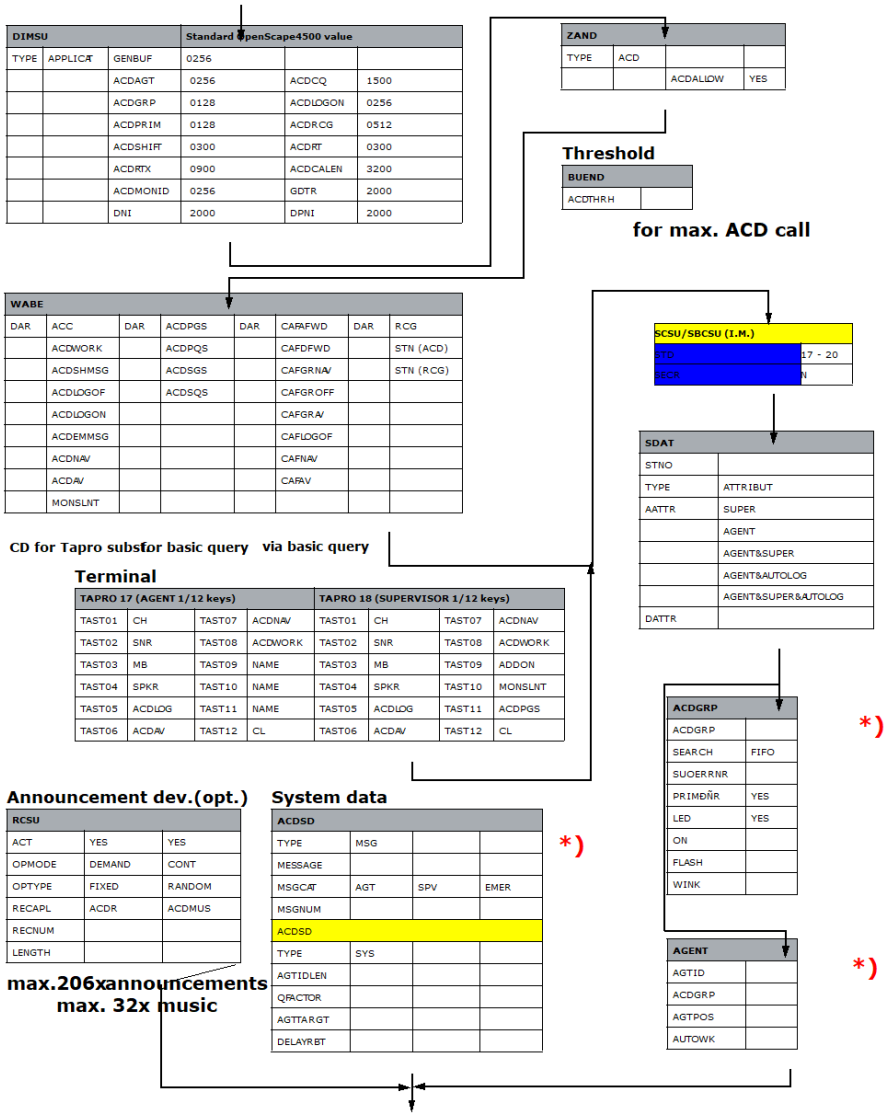


Figure 122: Generation information, part 1

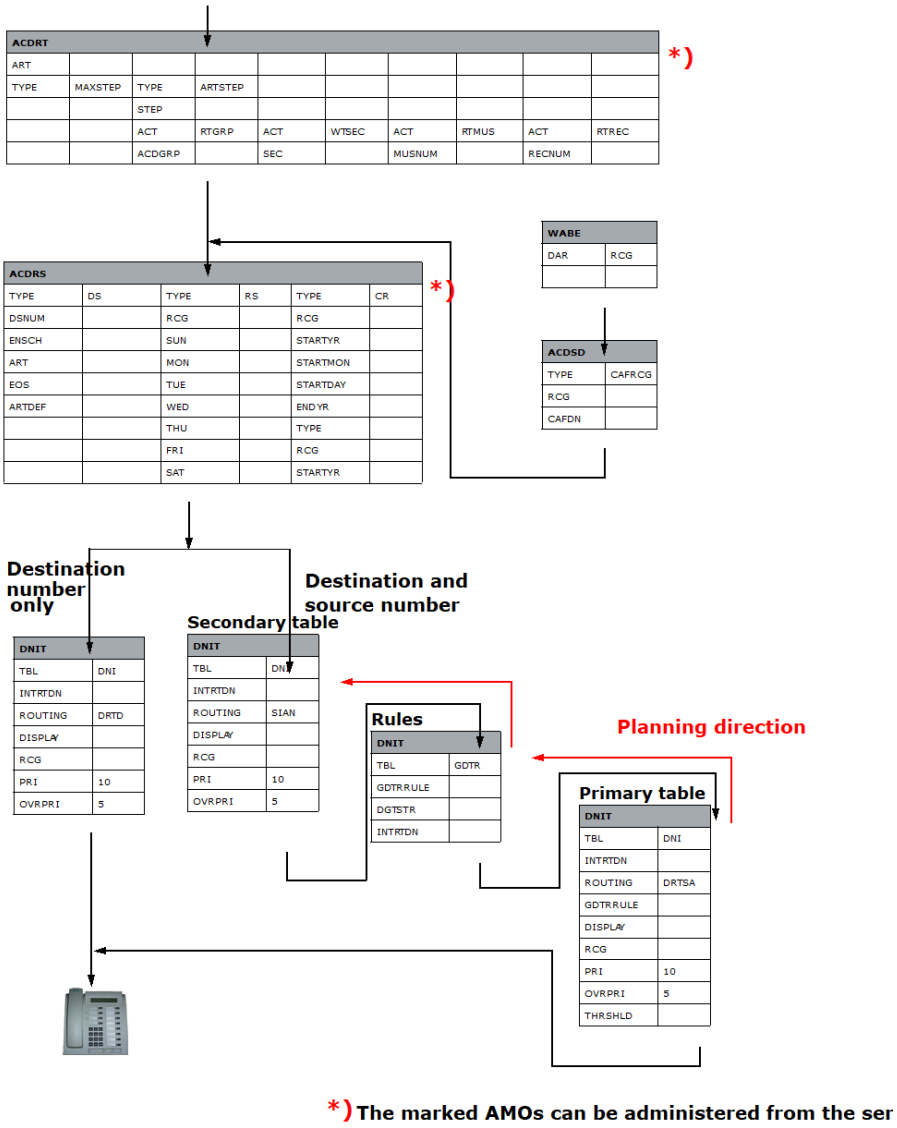


Figure 123: Generation information, part 2

12.2.4 Generation (Example)

12.2.4.1 Defining ACD call numbers, groups and users

The following ACD call numbers are defined:

7351 (hotline 1), 7352 (hotline 2) and 7353 (hotline 3)

Terminals 7361 through 7369 should be assigned AGENT properties. Terminals 7361, 7364, and 7367 should be assigned the SUPERVISOR property.

ACD group 1 should consist of the agent IDs 1637, 2637, and 3637. ACD group 2 should consist of the agent IDs 4637, 5637, and 6637. ACD group 3 should consist of the agent IDs 7637, 8637, and 9637.

An agent should be able to log on to random agent telephones using the agent ID.

- Enable ACD in the AMO ZAND and set the silent monitoring variant
  `CHA-ZAND:TYPE=ACD,ACDALLOW=YES,MONTONE=YES;`

  If you want silent monitoring to be performed without tones:
  `SET-ZAND:MONSLNT=YES;`
- Configure the codes in the DPLN

```
ADD-WABE:CD=**10,DAR=ACDLOGON,CHECK=N;

ADD-WABE:CD=##10,DAR=ACDLOGOF,CHECK=N;

ADD-WABE:CD=**11,DAR=ACDAV,CHECK=N;

ADD-WABE:CD=##11,DAR=ACDNAV,CHECK=N;

ADD-WABE:CD=**12,DAR=ACDWORK,CHECK=N;

ADD-WABE:CD=**13,DAR=ACC,CHECK=N;

ADD-WABE:CD=**14,DAR=MONSLNT,CHECK=N;

ADD-WABE:CD=**15,DAR=MONTONE,CHECK=N;

ADD-WABE:CD=**20,DAR=ACDPGS,CHECK=N;

ADD-WABE:CD=##20,DAR=ACDSGS,CHECK=N;

ADD-WABE:CD=**21,DAR=ACDPQS,CHECK=N;

ADD-WABE:CD=##21,DAR=ACDSQS,CHECK=N;

ADD-WABE:CD=**22,DAR=ACDEMMSG,CHECK=N;

ADD-WABE:CD=**23,DAR=ACDSHMSG,CHECK=N;

ADD-WABE:CD=##30,DAR=CAFLOGOF,CHECK=N;

ADD-WABE:CD=**31,DAR=CAFAV,CHECK=N;

ADD-WABE:CD=##31,DAR=CAFNAV,CHECK=N;

ADD-WABE:CD=**32,DAR=CAFGRAV,CHECK=N;

ADD-WABE:CD=##32,DAR=CAFGRNAV,CHECK=N;

ADD-WABE:CD=##33,DAR=CAFGROFF,CHECK=N;

ADD-WABE:CD=**34,DAR=CAFAFWD,CHECK=N;

ADD-WABE:CD=##34,DAR=CAFDFWD,CHECK=N;
```

- Display the call numbers that are required for flexrouting (agent, supervisor call number and hotline 1-3)
  `DIS-WABE:TYPE=GEN,CD=7350&&7369,DAR=STN;`

- Configure terminals 7361 && 7369

```
ADD-SBCSU:STNO=7361&&7369,OPT=OPTI,CONN=DIR,
DVCFIG=OPTISET,COS1=13,COS2=11,LCOSV1=5,LCOSV2=1,
LCOSD1=5,LCOSD2=1,DPLN=0,REP=1,STD=17;

CHA-TAPRO:STNO=7361&7364&7367,STD=18;

ADD-PERSI:TYPE=STN,STNO=7361,NAME=SUPERVISOR,PIN1=1637;

ADD-PERSI:TYPE=STN,STNO=7362,NAME=AGENT,PIN1=2637;

ADD-PERSI:TYPE=STN,STNO=7363,NAME=AGENT,PIN1=3637;

ADD-PERSI:TYPE=STN,STNO=7364,NAME=SUPERVISOR,PIN1=4637;

ADD-PERSI:TYPE=STN,STNO=7365,NAME=AGENT,PIN1=5637;

ADD-PERSI:TYPE=STN,STNO=7366,NAME=AGENT,PIN1=6637;

ADD-PERSI:TYPE=STN,STNO=7367,NAME=SUPERVISOR,PIN1=7637;

ADD-PERSI:TYPE=STN,STNO=7368,NAME=AGENT,PIN1=8637;

ADD-PERSI:TYPE=STN,STNO=7369,NAME=AGENT,PIN1=9637;
```

- Assign agent/supervisor skills for the terminals
  - Activate stations 7361, 7364, and 7367 as SUPERVISOR with the attributes: agent and supervisor, automatic logon and monitoring authorization

```
CHANGE-SDAT:STNO=7361,TYPE=ATTRIBUT,AATTR=AGENT&SUPER&AUTOLOG&CASTMON&CAF;
CHANGE-SDAT:STNO=7364,TYPE=ATTRIBUT,AATTR=AGENT&SUPER&AUTOLOG&CASTMON&CAF;
CHANGE-SDAT:STNO=7367,TYPE=ATTRIBUT,AATTR=AGENT&SUPER&AUTOLOG&CASTMON&CAF;
```

  - Activate stations 7362, 7363, 7365, 7366, 7368, and 7369 as AGENT with the attribute: agent can be monitored

```
CHA-SDAT:STNO=7362&&7363,TYPE=ATTRIBUT,AATTR=AGENT&CBSTMON;
CHA-SDAT:STNO=7365&&7366,TYPE=ATTRIBUT,AATTR=AGENT&CBSTMON;
CHA-SDAT:STNO=7368&&7369,TYPE=ATTRIBUT,AATTR=AGENT&CBSTMON;
```

- Set the ACD system data
  - ID= 4-digit, priority increased after 20 s, ID-based identification, ringback tone delay of 3 s.
  - When setting AGTIDTYP=ID, the ID number is used to create the link to the ACD group when logging the agent on.

```
CHA-ACDSD:TYPE=SYS,AGTIDLEN=4,QFACTOR=20,AGTTARGT,
DELAYRBT=3;
```

  - Check if the ROUTREQ timer is less than the DELAYRBT

```
DISPLAY-CTIME:TYPESWU=CP1;
```

  - The DELAYRBT should not exceed five seconds. The maximum length in the OpenScape 4000 is approximately 30 seconds (protocol timer T310). The exact value depends on the partner system, for example, Telekom

- Configure ACD group 1

  The LED threshold values are based on the number of waiting calls.

  This is the primary group of supervisor 7361.

  ```
  ADD-ACDGP:ACDGRP=1,TYPE=NORMAL,SEARCH=FIFO,
  SUPEXT=7361,PRIMARY=YES,LED=YES,ON=1,FLASH=2,
  WINK=3;
  ```

  Assign agents to group 1 (AUTOEXT is only required if the call number is needed for identification. No other agents can then log on to this device with their own call number).

  ```
  ADD-AGENT:AGTID=1637,ACDGRP=1,AGTTYPE=NORMAL,
  AUTOWK=5;

  ADD-AGENT:AGTID=2637,ACDGRP=1,AGTTYPE=NORMAL,
  AUTOWK=5;

  ADD-AGENT:AGTID=3637,ACDGRP=1,AGTTYPE=NORMAL,
  AUTOWK=5;
  ```

- Configure ACD group 2

  The LED threshold values are based on the number of waiting calls.

  This is the primary group of supervisor 7364.

  ```
  ADD-ACDGP:ACDGRP=2,TYPE=NORMAL,SEARCH=FIFO,
  SUPEXT=7364,PRIMARY=YES,LED=YES,ON=1,FLASH=2,
  WINK=3;
  ```

  Assign agents to group 2 (AUTOEXT, see group 1).

  ```
  ADD-AGENT:AGTID=4637,ACDGRP=2,AGTTYPE=NORMAL,
  AUTOWK=5;

  ADD-AGENT:AGTID=5637,ACDGRP=2,AGTTYPE=NORMAL,
  AUTOWK=5;

  ADD-AGENT:AGTID=6637,ACDGRP=2,AGTTYPE=NORMAL,
  AUTOWK=5;
  ```

- Configure ACD group 3

  The LED threshold values are based on the number of waiting calls.

  This is the primary group of supervisor 7367.

  ```
  ADD-ACDGP:ACDGRP=3,TYPE=NORMAL,SEARCH=FIFO,
  SUPEXT=7367,PRIMARY=YES,LED=YES,ON=1,FLASH=2,
  WINK=3;
  ```

  Assign agents to group 3 (AUTOEXT, see group 1).

  ```
  ADD-AGENT:AGTID=7637,ACDGRP=3,AGTTYPE=NORMAL,
  AUTOWK=5;

  ADD-AGENT:AGTID=8637,ACDGRP=3,AGTTYPE=NORMAL,
  AUTOWK=5;
  ```

```
ADD-AGENT:AGTID=9637,ACDGRP=3,AGTTYPE=NORMAL,
AUTOWK=5;
```

- Create short messages
  - Create messages to the supervisor.

    ```
    CHA-ACDSD:TYPE=MSG,MESSAGE=PLEASE REMOVE,
    MSGCAT=SPV,MSGNUM=1;

    CHA-ACDSD:TYPE=MSG,MESSAGE=ASSISTANCE REQUESTED,
    MSGCAT=SPV,MSGNUM=2;
    ```
  - Create messages to the agent.

    ```
    CHA-ACDSD:TYPE=MSG,MESSAGE=PREPARE REMOVAL,
    MSGCAT=AGT,MSGNUM=1;

    CHA-ACDSD:TYPE=MSG,MESSAGE=POOR PERFORMANCE,
    MSGCAT=AGT,MSGNUM=2;
    ```
  - Configure an emergency message.

    ```
    CHA-ACDSD:TYPE=MSG,MESSAGE=HEART ATTACK,
    MSGCAT=EMER;
    ```

12.2.4.2 Defining routes

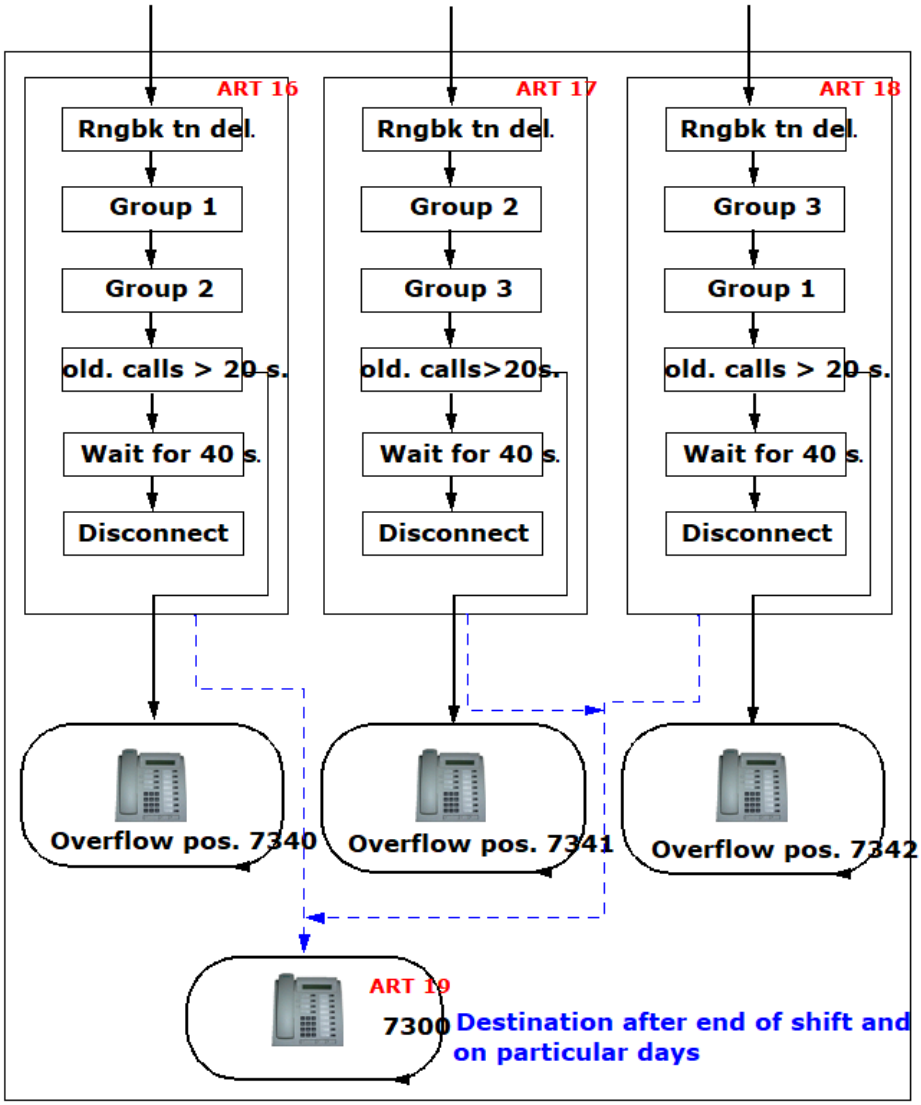


Figure 124: Overview of route configuration

ACD routes 2-15 can only be modified with SET.
`SET-ACDRT:ART=2,TYPE=MAX,MAXSTEP=5;`

- Configure the ACD routing tables
  - Configure ACD routing table 16

    `ADD-ACDRT:ART=16,MAXSTEP=8;`

    Configure ACD route 16:

    Go to ACD group 1 with overflow to ACD group 2 and subsequent breakout to station 7340 if a user has been waiting in the queue for more than 20 s.

    `CHA-ACDRT:ART=16,TYPE=ARTSTEP,STEP=1,ACT=DELAYRB;`

```
CHA-ACDRT:ART=16,TYPE=ARTSTEP,STEP=2,ACT=RTGRP,
ACDGRP=1;

CHA-ACDRT:ART=16,TYPE=ARTSTEP,STEP=3,ACT=RTGRP,
ACDGRP=2;

CHA-ACDRT:ART=16,TYPE=ARTSTEP,STEP=4,ACT=COND,
CACDGRP=1,CGSTEP=7,TEST=OLDINQGT,VALOLD=00-20;

CHA-ACDRT:ART=16,TYPE=ARTSTEP,STEP=5,ACT=WTSEC,
SEC=40;

CHA-ACDRT:ART=16,TYPE=ARTSTEP,STEP=6,ACT=DISCON;

CHA-ACDRT:ART=16,TYPE=ARTSTEP,STEP=7,ACT=RTEXT,
EXTNUM=7340;

CHA-ACDRT:ART=16,TYPE=ARTSTEP,STEP=8,ACT=DISCON;
```

– Configure ACD routing table 17

```
COPY-ACDRT:ART=16,NEWART=17;
```

Configure ACD route 17:

Go to ACD group 2 with overflow to ACD group 3 and subsequent breakout to station 7341 if a user has been waiting in the queue for more than 20 s.

```
CHA-ACDRT:ART=17,TYPE=ARTSTEP,STEP=2,ACT=RTGRP,
ACDGRP=2;

CHA-ACDRT:ART=17,TYPE=ARTSTEP,STEP=3,ACT=RTGRP,
ACDGRP=3;

CHA-ACDRT:ART=17,TYPE=ARTSTEP,STEP=4,ACT=COND,
CACDGRP=2,CGSTEP=7,TEST=OLDINQGT,VALOLD=00-20;

CHA-ACDRT:ART=17,TYPE=ARTSTEP,STEP=7,ACT=RTEXT,
EXTNUM=7341;
```

– Configure ACD routing table 18

```
COPY-ACDRT:ART=17,NEWART=18;
```

Configure ACD route 18:

Go to ACD group 3 with overflow to ACD group 1 and subsequent breakout to station 7342 if a user has been waiting in the queue for more than 20 s.

```
CHA-ACDRT:ART=18,TYPE=ARTSTEP,STEP=2,ACT=RTGRP,
ACDGRP=3;

CHA-ACDRT:ART=18,TYPE=ARTSTEP,STEP=3,ACT=RTGRP,
ACDGRP=1;

CHA-ACDRT:ART=18,TYPE=ARTSTEP,STEP=4,ACT=COND,
CACDGRP=3,CGSTEP=7,TEST=OLDINQGT,VALOLD=00-20;

CHA-ACDRT:ART=18,TYPE=ARTSTEP,STEP=7,ACT=RTEXT,
```

```
EXTNUM=7342;
```

– Configure ACD routing table 19 for end-of-shift, Sundays, and holidays

```
ADD-ACDRT:ART=19, MAXSTEP=3;

CHA-ACDRT:ART=19,TYPE=ARTSTEP,STEP=1,
ACT=DELAYRB;

CHA-ACDRT:ART=19,TYPE=ARTSTEP,STEP=2,
ACT=RTEXT,EXTNUM=7300;

CHA-ACDRT:ART=19,TYPE=ARTSTEP,STEP=3,
ACT=DISCON;
```

- Configure and assign route control group (RCG) call numbers
  – Configure RCG call numbers (call numbers only used by flexrouting)

    Only digits 0-9 are permitted. You can use the asterisk (*) to delete the AMO ACDSD entry.

    ```
    ADD-WABE:CD=70001&&70003,DAR=RCG;
    ```

  – Assign RCG call numbers to the RCGs.

    ```
    CHA-ACDSD:TYPE=CAFRCG,RCG=1,CAFDN=70001;

    CHA-ACDSD:TYPE=CAFRCG,RCG=2,CAFDN=70002;

    CHA-ACDSD:TYPE=CAFRCG,RCG=3,CAFDN=70003;
    ```

- Create shift schedules
  – Extend shift schedules with CHANGE only.

    ```
    ADD-ACDRS:TYPE=DS,DSNUM=1,SHIFT=17-00,
    ART=16,EOS=YES,ARTDEF=19;

    ADD-ACDRT:TYPE=DS,DSNUM=2,SHIFT=18-00,
    ART=17,EOS=NO,ARTDEF=19;

    ADD-ACDRT:TYPE=DS,DSNUM=3,SHIFT=19-00,
    ART=18,EOS=NO,ARTDEF=19;

    ADD-ACDRT:TYPE=DS,DSNUM=4,SHIFT=23-59,
    ART=19,EOS=NO,ARTDEF=19;
    ```

  – Configure day routing tables.

    ```
    ADD-ACDRT:TYPE=RS,RCG=1,SUN=4,MON=1,TUE=1,
    WED=1,THU=1,FRI=1,SAT=4;

    ADD-ACDRT:TYPE=RS,RCG=2,SUN=4,MON=2,TUE=2,
    WED=2,THU=2,FRI=2,SAT=4;

    ADD-ACDRT:TYPE=RS,RCG=3,SUN=4,MON=3,TUE=3,
    WED=3,THU=3,FRI=3,SAT=4;
    ```

  – Configure calendar days with special routing (holidays).

    ```
    ADD-ACDRT:TYPE=CR,RCG=1,STARTMON=12,STARTDAY=24,
    ENDMON=12,ENDDAY=26,DSNUM=4;
    ```

```
ADD-ACDRT:TYPE=CR,RCG=2,STARTMON=12,STARTDAY=24,
ENDMON=12,ENDDAY=26,DSNUM=4;

ADD-ACDRT:TYPE=CR,RCG=3,STARTMON=12,STARTDAY=24,
ENDMON=12,ENDDAY=26,DSNUM=4;

ADD-ACDRT:TYPE=CR,RCG=3,STARTMON=11,STARTDAY=1,
ENDMON=11,ENDDAY=1,DSNUM=4;

ADD-ACDRT:TYPE=CR,RCG=2,STARTMON=11,STARTDAY=1,
ENDMON=11,ENDDAY=1,DSNUM=4;

ADD-ACDRT:TYPE=CR,RCG=1,STARTMON=11,STARTDAY=1,
ENDMON=11, ENDDAY=1,DSNUM=4;

ADD-ACDRT:TYPE=CR,RCG=1,STARTMON=1,STARTDAY=1,
ENDMON=1,ENDDAY=1,DSNUM=4;

ADD-ACDRT:TYPE=CR,RCG=2,STARTMON=3,STARTDAY=1,
ENDMON=1,ENDDAY=1,DSNUM=4;

ADD-ACDRT:TYPE=CR,RCG=3,STARTMON=1,STARTDAY=1,
ENDMON=1,ENDDAY=1,DSNUM=4;

ADD-ACDRT:TYPE=CR,RCG=3,STARTMON=1,STARTDAY=5,
ENDMON=1,ENDDAY=5,DSNUM=4;

ADD-ACDRT:TYPE=CR,RCG=2,STARTMON=1,STARTDAY=5,
ENDMON=1,ENDDAY=5,DSNUM=4;

ADD-ACDRT:TYPE=CR,RCG=1,STARTMON=1,STARTDAY=5,
ENDMON=1,ENDDAY=5,DSNUM=4;
```

- Configure destination-dependent routing

  AMO DNI (Directory number information translation) For normal users

  – Destination selection based on the number dialed (7351)

  ```
  ADD-DNIT:TBL=DNI,INTRTDN=7351,ROUTING=DRTD,
  DISPLAY="CALLS VIA 7351",ACD=YES,RCG=1,
  PRI=30,OVRPRI=20;
  ```

  – Destination selection based on the number dialed (7352)

  ```
  ADD-DNIT:TBL=DNI,INTRTDN=7352,ROUTING=DRTD,
  DISPLAY="CALLS VIA 7352",ACD=YES,RCG=1,
  PRI=30,OVRPRI=20;
  ```

  – Destination selection based on the number dialed (7353)

  ```
  ADD-DNIT:TBL=DNI,INTRTDN=7353,ROUTING=DRTD,
  DISPLAY="CALLS VIA 7353", ACD=YES,RCG=1,
  PRI=30,OVRPRI=20;
  ```

- Configure destination- and source-based routing

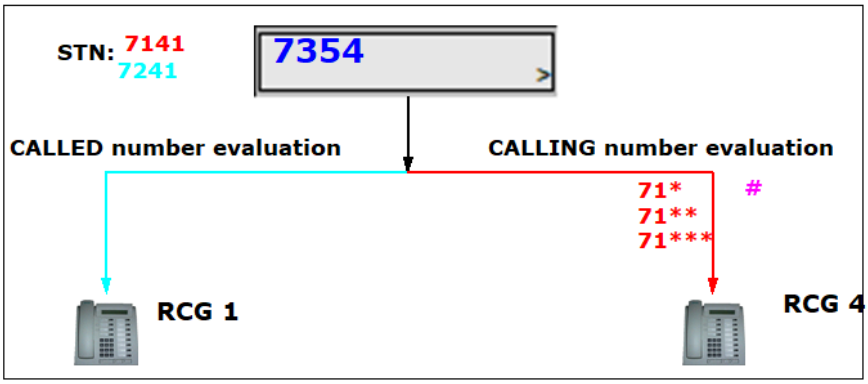


Figure 125: Overview of route configuration

AMO DNI (Directory number information translation)

For preferred users

Destination selection based on the number dialed (7354) and the calling number (calling party's call number).

- Route for source- and destination-based routing
  `ADD-WABE:CD=70004,DAR=RCG;`
- Call number for internal flexrouting addressing (call number is not dialed)
  `ADD-WABE:CD=70100,DAR=STN;`
- Define flexrouting route 4

  ```
  CHA-ACDSD:TYPE=CAFRCG,RCG=4,CAFDN=70004;
  ```
- Route for special stations with disconnection if extension is busy

  ```
  ADD-ACDRT:ART=20,MAXSTEP=3;

  CHA-ACDRT:ART=20,TYPE=ARTSTEP,STEP=1,
  ACT=DELAYRB;

  CHA-ACDRT:ART=20,TYPE=ARTSTEP,STEP=2,
  ACT=RTEXT,EXTNUM=7367;

  CHA-ACDRT:ART=20,TYPE=ARTSTEP,STEP=3,
  ACT=DISCON;
  ```
- Day shift number for special customers

  ```
  ADD-ACDRT:TYPE=DS,DSNUM=5,SHIFT=20-
  00,ART=20,EOS=NO,ARTDEF=19;

  ADD-ACDRT:TYPE=RS,RCG=4,SUN=4,MON=5,TUE=5,
  WED=5,THU=5,FRI=5,SAT=4;
  ```
- Route for special stations

  ```
  ADD-DNIT:TBL=DNI,INTRTDN=70100,GDTRRULE=0,
  DISPLAY="Customer King 7354",ACD=YES,RCG=4,
  PRI=30,OVRPRI=20,AUDSRCID=0,THRSHLD=*;
  ```
- Definition of special stations (all that begin with 71)

```
ADD-DNIT:TBL=GDTR,GDTRRULE=1,DGTSTR=71**,
INTRTDN=70100 ;
```

- Miscellaneous stations

```
ADD-DNIT:TBL=DNI,INTRTDN=7354,GDTRRULE=1,
DISPLAY="CUSTOMER Normal 7354",ACD=YES,
RCG=1,PRI=30,OVRPRI=20,AUDSRCID=0,THRSHLD=*;
```

12.2.5 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/Description
ACDGP	ACDGRP	d	ACD Gruppen Nummer
		e	acd group number
	SUCHE	d	Suchverfahren nach freien Agenten in dieser ACD Gruppe
	SEARCH	e	search method for acd group
	SUPERNR	d	Supervisor Rufnummer für diese ACD Gruppe
		e	primary option for acd group
	PRIMAER	d	Hauptgruppen Funktion für diese ACD Gruppe
	PRIMARY	e	primary option for acd group
	LED	d	Led Funktion für diese ACD Gruppe
		e	led options for acd group
	LEDEIN	d	Schwellwert für >Led leuchtet
	ON	e	led on option
	LEDLANG	d	Schwellwert für >Led, blinkt mit langer Pause
	FLASH		flash led option
	LEDKURZ	d	Schwellwert für >Led, blinkt mit kurzer Pause
	WINK	e	wink led option
ACDRS	ANFJAHR	d	Anfangsdatum: Jahr
	STARTYR	e	start year of range entity
	ANFMON	d	Anfangsdatum: Monat
	STARTMON	e	start month of range entity

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	ANFTAG	d	Anfangsdatum: Tag
	STARTDAY	e	start day of range entity
	ART	d	ACD Routing Tabelle der Arbeitsschicht
		e	acd routing table
	ARTDEF	d	Voreingestellte Art
		e	acd routing table default
	ASPLAN	d	Arbeitsschichtplan
	DSNUM	e	day shift number
	ASPLNDI	d	Arbeitsschichtplan für Dienstag
	TUE	e	tuesday day shift number
	ASPLNDO	d	Arbeitsschichtplan für Donnerstag
	THU	e	thursday day shift number
	ASPLANFR	d	Arbeitsschichtplan für Freitag
	FRI	e	friday day shift number
	ASPLANMI	d	Arbeitsschichtplan für Mittwoch
	WED	e	wednesday day shift number
	ASPLANMO	d	Arbeitsschichtplan für Montag
	MON	e	monday day shift number
	ASPLANSA	d	Arbeitsschichtplan für Samstag
	SAT	e	saturday day shift number
	ASPLANSO	d	Arbeitsschichtplan für Sonntag
	SUN	e	sunday day shift number
	ENDJAHR	d	Endedatum: Jahr
	ENDYR	e	end year of range entity
	ENDMON	d	Endedatum: Monat
	ENDMON	e	end month of range entity
	ENDTAG	d	Endedatum: Tag
	ENDDAY	e	end day of range entity
	ENDSCH	d	Ende der Arbeitsschicht

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	SHIFT	e	shift end time
	RCG	d	Route Controll Gruppe
		e	route control group
	SEF	d	Schichtendefunktion
	EOS	e	end of shift option
	TYP	d	Tabellentyp
	TYPE	e	type of table
ACDRT	ACDGRP	d	Nummer der ACD Gruppe
		e	acd group number
	AGENTEN	d	Anzahl der Agenten für Vergleich
	VALAGT	e	condition compare value for agents
	AGTID	d	Identifikationsnummer des Agenten
		e	agent id
	AKTION	d	Welche Aktion wird beim Step ausgeführt
	TEST	e	type of conditional test
	ANRUFE	d	Anzahl der wartenden Anrufe für Vergleich
	VALCAL	e	condition compare value for calls queued
	ANSAGENR	d	Nummer der Sprachansage
	RECNUM	e	recorded announcement number
	ART	d	Nummer der ACD Routing Tabelle
		e	acd routing table number
	EXTTLNNU	d	Externe Teilnehmerrufnummer
	EXTNUM	e	extension number
	MAXSTEP	d	Anzahl der möglichen Steps
		e	maximum step of art
	MUSIKNR	d	Nummer der Wartemusik
	MUSNUM	e	music number
	NEUART	d	Nummer der neuen ACD Routing Tabelle
	NEWART	e	acd routing table number for copied art

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	PACDGRP	d	Diese ACD Gruppe wird überprüft
	CACDGRP	e	acd group for conditional checks
	PRUEFBED	d	Typ der Prüfbedingung
	TEST	e	type of conditional test
	SEK	d	Wartezeit in Sekunden
	SEC	e	seconds
	STEP	d	Step-Nummer
		e	step number
	TLNNU	d	Interne Tln-Rufnummer
		e	
	TYP	d	Was soll administriert werden
	TYPE	e	function mode
	ZEIT	d	Wartezeit für Vergleich
	VALOLD	e	condition compare value for oldest call in queue
	ZIEL	d	Sprungziel (Fortsetzung mit diesem Step)
	GSTEP	e	step goto number
	ZIELBED	d	Sprungziel (wenn Bedingung erfüllt)
	CGSTEP	e	step goto number for conditional step
ACDSD	AGTIDLAE	d	Länge der Identifikationsnummer der ACD Agenten
	AGTIDLEN	e	acd agent's id length
	AGTIDTYP	d	Wie werden die ACD Agenten identifiziert
	AGTTARGT	e	acd agent target
	FTONVERZ	d	Freiton - Verzögerung in Sekunden
	DELAYRBT	e	delay ringback timer
	NACHRNUM	d	Nachrichtennummer
	MSGNUM	e	message number
	NACHRTXT	d	Nachrichtentext
	MESSAGE	e	message text

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	NACHRTYP	d	Nachrichtentyp
	MSGCAT	e	message category
	PRIOZEIT	d	Zeit in Sek. bis ein wart. Anruf eine höhere Prio. bekommt
	QFACTOR	e	queue factor timer
	RCG	d	Route Control Group
		e	route control group
	RCGADR	d	REG Adressennummer (für CAF)
	CAFDN	e	control agent facility directory number for rcg
	TYP	d	Tabellentyp
	TYPE	e	type of table
AGENT	ACDGRP	d	ACD Gruppen-Nummer
		e	acd group number
	AGTID	d	Identifikations-Nummer des Agenten
		e	agent's identification number
	AGTPOS	d	Position des Agenten in der ACD Gruppe
		e	agent's position in a group
	AUTOARB	d	Zeit in Sekunden zur Nachbearbeitung eines Anrufs
	AUTOWK	e	auto work time
	AUTORNR	d	Rufnummer für automatisches anmelden
	AUTOEXT	e	auto logon extension number
	NEUID	d	Neue Identifikations-Nummer des Agenten
	NEWID	e	agent's new identification number
	TYP	d	Was soll gelöscht werden.
	TYPE	e	type of deletion
DIMSU	ACDAGT	d	Anzahl der ACD Agenten
		e	number of acd (automatic call distribution) agents

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	ACDCQ	d	Anzahl der Einträge im ACD Anrufordner
		e	number of acd call-queuing pool elements
	ACDGRP	d	Anzahl der ACD Gruppen
		e	number of acd groups
	ACDKALEN	d	Anzahl der Einträge für ACD Kalender-Routing
	ACDCALEN	e	number of calendar routing entries
	ACDLOGON	d	Anzahl der Agenten, die zur gleichen Zeit angemeldet sind
		e	number of acd agents logged on at once
	ACDMONID	d	Anzahl der ACD Monitorpunkte (nur ACD - G)
		e	no. of monitored id sets (e.g. acd agents, trunk groups ...)
	ACDPRIM	d	Anzahl der ACD Primär - Agenten
		e	number of primary acd agent positions
	ACDRCG	d	Anzahl der ACD Routing - Control Gruppen
		e	number of acd route-control groups
	ACDRT	d	Anzahl der ACD Routing Tabellen
		e	number of acd routing step tables
	ACDRTX	d	Anzahl der ACD Routing Zusatztabellen
		e	number of auxiliary acd routing step tables
	ACDSCH	d	Anzahl der ACD Schichtzeiten
	ACDSHIFT	e	number of acd shifts
	DNI	d	Anzahl der Einträge für die Umwertung der B-Rufnr.
		e	number of directory number information table indices
	DPDNI	d	Anzahl der Datenpoolelemente für den Dimsu Parameter DNI
		e	number of datapool elements reserved for dimsu parameter dni

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	GDTR	d	Anzahl der Einträge für die Umwertung der A-Rufnr.
		e	number of general digit translation table entries
DNIT	ANSAGENR	d	Nummer der Sprachansage
	AUDSRCID	e	audible source identification
	ANZEIGE	d	Anzeigetext für das gerufene Endgerät
	DISPLAY	e	called device display
	GDTRRGL	d	Nummer einer GDTR-Regel zur SID/ANI Umsetzung
		e	
	INTRTADR	d	Interne Routing Adressnummer
	INTRTDN	e	internal routing directory number
	MAXANRUF	d	Anzahl gleichzeitiger ACD Anrufe bei dieser Reg.
	THRSHLD	e	number of incoming trunk acd calls
	NGDTRRGL	d	Neue Nummer einer GDR-Regel zur SID/ ANI Umsetzung
	NEWRULE	e	new gdtr element with sid/ani rule
	NREGEL	d	Neue Regel zur allg. Zeichenumsetzung
	NEWDGTS	e	new digit string
	PRIO	d	Priotät des ACD Anrufs in Anrufordner
	PRI	e	priority for acd call queued to acd group
	RCG	d	Route Control Group
		e	route control gruppe
	REGEL	d	Regel zur allg. Zeichenumsetzung
	DGTSTR	e	digit string for dnis or sid/ani
	ROUTING	d	Verwendetes Verfahren für das Routing
		e	type of routing to take place
	TAB	d	Auswahl der betreffenden Tabelle

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	TBL	e	used table for directory number information and translation
	UEBLPRIO	d	Priorität des ACD Anrufs nach Überlauf
	OVRPRI	e	overflow priority for acd call
RCSU	ANSLAE		Länge der Ansage in Sekunden
	LENGTH	e	length of recorded announcement in seconds
	ANSNR	d	Nummer der Sprachansage
	RECNUM	e	number of recorded announcement
	ANWENDNG	d	Anwendung des Ansagegerätes
	RECAPL	e	application of the selected recorder
	ANZ	d	Anzahl der einzuricht. Ansagegeräte
	NO	e	number of recorders to be created
	BETRART	d	Betriebsart des Ansagegerätes
	OPMODE	e	operation mode for recorders
	CIRCIDX	d	Index zur Timerblocktabelle für SLMA
		e	index into timer block table for slma1 circuit
	MUSNR		Nummer der Musik
	MUSNUM	e	number of music recording
	WIEDART		Wiedergabeart des Ansagegerätes
	OPTYPE	e	operation type for recorder
SDAT	AMERK	d	Teilnehmermerkmale ausfügen
	DATTR	e	delete subscriber attribute
	EMERK	d	Teilnehmermerkmale einfügen
	AATTR	e	add subscriber attribute
	TYP	d	Typ der Administration
	TYPE	e	type of administration
TAPRO	ACC	d	Account Code (Gespräch makieren)
		e	account code

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	ACDAGTN	d	Nachrichten zum Agenten schicken
	ACDAGTM	e	send message to agent
	ACDARB	d	Agent arbeitet
	ACDWORK	e	agent work
	ACDLOG	d	Agent logon/logoff
		e	agent logon/logoff
	ACDNOTN	d	Notfallnachricht
	ACDEMMSG	e	emergency message
	ACDNVB	d	Agent nicht verfügbar
	ACDNAV	e	agent not available
	ACDPGS	d	Primärer Gruppenstatus
		e	primary group status
	ACDPQS	d	Primärer Queue Status
		e	primary queue status
	ACDSGS	d	Sekundärer Gruppenstatus
		e	secondary group status
	ACDSPVN	d	Nachricht zum Supervisor senden
		e	send message to supervisor
	ACDSQS	d	Sekundärer queue Status
		e	secondary queue status
	ACDVB	d	Agent verfügbar
	ACDAV	e	agent available
	ACK	d	Nachricht Quittieren
		e	message acknowledgment
	MITHOERT	d	Mithören mit Ton
	MONTONE	e	tone monitoring
WABE	ACC	d	Account Code
		e	account code
	ACDARB	d	Agent arbeitet

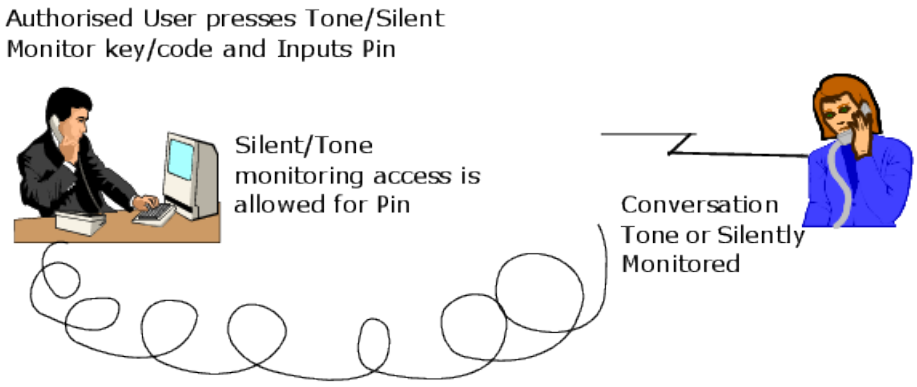
AMO	Parameter	Sprache/ Language	Beschreibung/Description
	ACDWORK	e	agent work
	ACDKURZN	d	Kurznachrichten
	ACDSHMSG	e	short message
	ACDLOGOF	d	Agent logogg
		e	agent logoff
	ACDLOGON	d	Agent logon
		e	agent logon
	ACDNOTN	d	Notfallnachricht
	ACDEMMSG	e	emergency message
	ACDNVB	d	Agent nicht verfügbar
	ACDNAV	e	agent not available
	ACDPGS	d	Primär Grupen Status
		e	primary group status
	ACDPQS	d	Primär Queue SStatus
		e	primary queue status
	ACDSGS	d	Sekundär Gruppen Status
		e	secondary group status
	ACDSQS	d	Sekundär Queue Status
		e	secondary queue status
	ACDVB	d	Agent Verfügbar
	ACDAV	e	agent available
	CAFAULA	d	CAF ausschalten der Umleitung der RCG
	CAFDFWD	e	caf deactivate forwarding of rcg
	CAFAULE	d	CAF einschalten der Umleitung der RCG
	CAFAFWD	e	caf activate forward of rcg
	CAFGRNVB	d	CAF Gruppe nicht verfügbar
	CAFGRNAV	e	caf group not available
	CAFGROFF	d	CAF Gruppe logoff
	CAFGROFF	e	caf group logoff

AMO	Parameter	Sprache/ Language	Beschreibung/Description
	CAFGRVB	d	CAF Gruppe verfügbar
	CAFGRAV	e	caf group available
	CAFLOGOF	d	CAF Agent lofoff
	CAFLOGOF	e	caf agent logoff
	CAFNVB	d	CAF Agent nicht verfügbar
	CAFNAV	e	caf agent not available
	CAFVB	d	CAF Agent verfügbar
	CAFAV	e	caf agent available
	RCG	d	Route Control Group Nummer
		e	route control group number
ZAND	ACDERL	d	FlexRouting Schalten
	ACDALLOW	e	FlexRouting allowed
	MITHOERT	d	FlexRouting Mithören mit Ton
	MONTONE	e	FlexRouting tone monitoring
	MITHOER	d	FlexRouting Mithören ohne Ton (nur über SETZEN)
	MONSLNT	e	FlexRouting Silent monitoring

12.3 Flexrouting Silent/Tone Monitoring PIN

12.3.1 Overview

In certain countries it is allowed for calls to be monitored either silently or with the injection of a tone. Two features "Silent Monitoring" and "Tone Monitoring" are available for certain class marked stations to enable them to carry out this function. Also stations who are to be Silent/Tone monitored have also to be class marked. As an additional security feature the monitoring stations can be forced to input a PIN prior to executing Silent/Tone monitoring.



12.3.2 Feature Description

The Silent/Tone Monitoring PIN feature is built upon the the ACD Silent/Tone Monitoring feature and the PIN (Personal Identification Number) feature.

It is an optional security enhancement for the ACD Silent/Tone Monitoring feature which requires the user to enter a valid password before activating Silent/Tone Monitoring. The password used will be a local or network PIN number. COPINs 1-4 and the ID card PIN are valid as long as the home station of the PIN possesses the "can activate silent/tone monitoring" attribute. If the PIN's associated home station number is not configured with this monitoring authorization, the monitoring activation request is denied.

When the switch is configured for the network PIN mode of operation, the connection between the local switch and the remote switch where the home station of the PIN may be located, must be CorNet-NQ end to end.

If the PIN was required for monitoring activation, it will be deactivated when monitoring ends (the only exception is the ID card PIN which will remain active even after monitoring ends.) If, however, the PIN was not required for monitoring activation, PIN deactivation occurs only for short PIN.

It is also possible to silent monitor all agents using an application which will record all calls. When an agent is not on the phone but is monitored, the supervisor normally hears "please hold the line" every 4 seconds. This means that a record of 8 hours will contain a lot useless information. Using a parameter in AMO ZANDE it is possible to suppress this message and the application stops recording when there is no line activity for 6 seconds.

It is also possible to monitor a consultation call. This feature is called "Extended Silent Monitoring/Tone Monitoring".

12.3.3 User Interface

12.3.3.1 Feature Activation with Positive Acknowledgement

If the system flag for the Monitoring with PIN is enabled, PIN activation must precede activation of Silent/Tone Monitoring.

The user can activate a PIN by using the service menu, by inserting the ID PIN chip card into the telephone device, or by employing the PIN Manual feature dialing procedure. If the entered PIN is valid, it will remain active for the time configured in its COPIN. If the system flag for the Monitoring Pin is not enabled, the Silent/Tone Monitoring feature is activated using the previous unsecure activation procedure.

Tone monitoring may be activated by pressing the MONTONE key configured on the digite device or by dialing the access code for Tone Monitoring.

Silent monitoring may be activated by pressing the ADDON key configured on the digite device or by dialing the access code for Silent Monitoring.

After a PIN has been entered, Silent/Tone Monitoring can be activated during the time the PIN is active. When a PIN is activated, the user hears dial tone and can then start the activation of Silent/Tone monitoring without first going on hook. In the case of "long" PIN or the ID card PIN, the user may go on hook and then activate monitoring at a later point in time as long the PIN is active.

12.3.3.2 Feature Activation with Negative Acknowledgement

An user attempting to activate the Silent/Tone Monitoring feature without an active PIN when a PIN is required, will receive the message "Not authorized" after the Silent/Tone Monitoring access code has been entered or after the Silent/Tone Monitoring key has been depressed.

12.3.3.3 Feature Deactivation

When the Silent/Tone Monitoring party goes on hook, monitoring is deactivated. If the Monitoring PIN was a requirement for the activation of Monitoring, the active "short" or "long" PIN is also deactivated and the message "Identification deleted" is displayed for digites with display. The ID card PIN is not deactivated.

If, however, the Monitoring PIN system parameter was not a requirement for Monitoring, the "long" PIN or the ID card PIN is not deactivated. The short PIN is deactivated as is usually done after one call.

12.3.4 Service Information

A station or a recording device, which has the proper authorizations can listen the calls made by a another station to a third party. Only the basic calls can be listened and when the monitored station leaves the actual call and goes ino consultation with another subscriber or trunk, the monitoring is interrupted and the monitor hears the "Please hold" announcement. It is also possible to monitor a consultation call.

The monitoring will be extended with the same type of monitoring as the initial call! For example, if the monitor has activated the Tone Monitoring, for the consultation call the tone will also be present, given the condition that the extended tone monitoring is enabled.

The monitoring of the consultation call is started only if the Extended Monitoring is enabled for the whole system by means of AMO ZANDE through the parameters **EXTMNTON** or **EXTSLTMN**.

The monitoring can be either silent or with tone and can only be activated from a Digite or an Anate phone.

Only Digites and Anates can be monitored as targets.

The supported partners of the monitored station are:

- Digital phones
- Analog phones
- SIP devices
- Functional devices
- Trunks (digital/analog)

silent

The silent monitoring implies that the listened parties are not notified about the fact that they are being monitored.

tone

The tone monitoring means that the monitored and its partner are hearing a tone which lets them know that their call is monitored by another station.

12.3.5 Feature Interactions

Call Forwarding:

If the montiored party attempts to initiate a consultation call towards a forwarded station, when the forward destination picks up the call, the conversation will be monitored, regardless of the forwarding type (CF unconditional, CF busy, CF no reply).

Pickup Groups:

If the montiored party attempts to initiate a consultation call towards a station which is member in a PickUp Group and the call is picked-up by another member, the call will be monitored.

Hunting Groups:

If the montiored party attempts to initiate a consultation call towards a station which is a Hunt Group Master, and the call is answerded by another member, the call will be monitored.

If the monitored party dials the number of a HuntGroup and the call advances to a member which answers is, the call will be monitored.

Direct Call Pickup:

If the montiored party attempts to initiate a consultation call towards a station and another station answers the call using the Direct Call Pickup feature, the call will be monitored.

Enhanced Silent Monitoring:

If Enhanced Silent Monitoring is active in the system (**SILMON** is active in AMO FEASU) it cannot be invoked and will have no effect during Extended Silent Monitoring scenarios.

12.3.6 Generation (Example)

- Set the system parameter that enables the Monitoring PIN (Default value is NO):
  `CHA-ACDSD:TYPE=SYS,MONPIN=YES;`

  IMPORTANT: If the **MONPIN** parameter is set to **NO** but all other conditions are valid the Silent/Tone monitoring function works but is not reliant on secure access. It is only required that the station is classmarked. ANY user at that station can Silent/Tone monitor.

- Allow **Silent Monitoring** in the system:
  `SET-ZAND:MONSLNT=YES;`
- Allow the ACD feature and **Tone Monitoring** in the system:
  `CHA-ZAND:TYPE=ACD,ACDALLOW=YES,MONTONE=YES;`
- Add the digits for dial access to the **Silent Monitoring** feature:
  `ADD-WABE:CD=728,DAR=MONSLNT;`
- Add the digits for dial access to the **Tone Monitoring** feature:
  `ADD-WABE:CD=729,DAR=MONTONE;`
- Add the **Silent Monitoring** key to a phone:
  `CHA-TAPRO:STNO=3356,KY04=ADDON;`
- Add the **Tone Monitoring** key to a phone:
  `CHA-TAPRO:STNO=3356,KY05=MONTONE;`
- Enable monitoring authorization for a particular station:
  `CHA-SDAT:STNO=3358,TYPE=ATTRIBUT,AATTR=CASTMON;`
- Enable the target station to be silent/tone monitored:
  `CHA-SDAT:STNO=3357,TYPE=ATTRIBUT,AATTR=CBSTMON;`
- Don't activate **SILMON** in AMO FEASU.
  `CHANGE-FEASU:TYPE=D,CM=SILMON;`

  IMPORTANT: The **SILMON** parameter in AMO FEASU is used for activating a feature which allows the monitor to initiate a conference with the monitored parties, which is not possible in a Silent/Tone Monitoring scenario. By enabling this feature, the 'normal' Silent/Tone Monitoring will be widely affected, with the displays and the behaviour of the subscribers being modified (tones, keys pressed, states, etc.).

- Suppress "Please hold the line" when an silent monitored agent is not on the phone
  `CHANGE-ZANDE:TYPE=ACD,NODHOLDT=YES;`
- Activation of the feature "Extended Silent/Tone Monitoring"

```
CHANGE-ZANDE:TYPE=ACD,EXMNTONE=YES;
/*Tone monitoring

CHANGE-ZANDE:TYPE=ACD,EXTSLTMN=YES;
/* Silent monitoring
```

12.3.7 Relevant AMOs

AMO	Parameter	Language	Description
ACDSD	MONPIN	e	New parameter to signify whether the PIN password is required to activate Silent/Tone Monitoring
	MONPIN	d	Neuer Parameter, der definiert, ob für die Aktivierung des Mithörens ohne/ mit Ton das PIN-Passwort benötigt wird.
FEASU	SILMON	e	Enhanced Silent/Tone Monitoring
	SILMON	d	Verbessertes Mithören ohne/mit Ton
SDAT	ATTRIBUT	e	Set CASTMON for the home station of the PIN used, and CBSTMON for the monitored target station
	MERKMAL		CASTMON für die Heimatstation der benutzten PIN und CBSTMON für die Sprechstelle setzen, die mitgehört werden kann.
TAPRO	KYnn	e	Configure MONTONE (key for activating Tone Monitoring) & ADDON (key for activating Silent Monitoring) on a digite device
	TDnn	d	Auf einem Digite MITHOERT (Taste für Aktivierung Mithören mit Ton) und ZZU (Taste für Aktivierung Mithören ohne Ton) konfigurieren.
WABE	CD	e	Configure the access code for MONSLNT and MONTONE
	KZP	d	Kennzahl für MITHOER und MITHOERT konfigurieren.
ZAND	ACD	e	ACDALLOW must be set to yes.
	ACD	d	ACDERL muss auf JA gesetzt sein.
	MONTONE=YES	e	Tone Monitoiring
	MITHOERT=YES	d	Mithören mit Ton
	MONSLNT=YES	e	Silent Monitoring
	MITHOER=JA	d	Mithören ohne Ton (Silent Monitoring)
ZANDE	EXMNTONE	e	Extended tone monitoring
	EXTMNTON	d	Erweitertes Ton Monitoring

AMO	Parameter	Language	Description
	EXTSLTMN	e	Extended silent monitoring
	EXTSLTMN	d	Erweitertes Silent Monitoring
	SILMON	e	If this parameter is set, the 'normal' Silent/Tone Monitoring will be widely affected, with the displays and the behaviour of the subscribers being modified.
	SILMON	d	Ist dieser Parameter gesetzt, wirkt sich das auf das "normale" Mithören ohne/mit Ton aus, insbesondere auf die Anzeigen und das Verhalten der Teilnehmer (Töne, Tasten, Status usw.)
	NOHOLDT	e	When this parameter is set to YES the silent monitoring party (supervisor) hears silence (instead of "Please hold the line") if the monitored party (agent) is not talking on the phone.
	KHTON	d	Wenn der Parameter gesetzt ist, hört der Silent Monitoring Teilnehmer (Supervisor) Stille (anstatt Halteton / -musik), wenn der abgehörte Agent sich nicht im Rufzustand befindet.

12.4 Whisper Announcement

12.4.1 Feature Description

To create a feature which allows supervisors in call centers to join a call and discreetly coaching an agent. It can also be used in boss/secretary arrangements for a discreet call announce. The new feature is called "Whisper Announcement" or "Discreet Coaching".

12.4.2 Realization

The Whisper Announcement feature is to be an expanded version of Silent Monitoring. Silent Monitoring feature allows a supervisor to monitor agent calls which are currently in progress. The supervisor microphone is switched off when Silent Monitoring feature is in use; agents and callers don't hear the supervisor. In case of Whisper Announcement activation, the supervisor will be heard by the agent and will be able to discreetly make an announcement for the agent. The agent partner will not hear supervisor's actions. He will hear only the agent. To fulfill the new requirements, the existing Silent Monitoring

implementation is enhanced to switch on the supervisor microphone in order to be heard only by the agent. Whisper Announecement is a monitoring feature.

12.4.3 User Interface

12.4.3.1 ACD WHISPER ANNOUNCEMENT Feature Activation

The ACD Whisper Announcement feature can be activated from any properly classmarked supervisor set from the initial dial state only (see Section 165.4, "Administration" for AMO commands).

The ACD Whisper Announcement feature can be activated by pressing a feature key or by dialing a feature access code (see Section 165.4, "Administration" for AMO commands). If a feature key is used, then CP will receive DB_CP_E_SC_WHISPER_ANN_KEY event. If a feature access code was dialed, then digit analysis shall return DB_KZP_WHISPER_ANN.

The supervisor's class of service is checked to determine if the ACD Whisper Announcement feature can be activated from this line.

If not authorized, negative acknowledgement tone is connected and a **NOT AUTHORIZED** display is provided.

If authorized to activate ACD Whisper Announcement, a system flag is checked to determine whether the target party is to be specified by extension number or by agent logon id (see Section 165.4, "Administration" for AMO commands).

The appropriate display (**ENTER LOGON ID** or **ENTER STATION NO.**) will be provided along with Recall dial tone.

If the addressing is to be done by extension number, the directory number of the target party is collected and digit analysis is called to verify that a valid extension number has been dialed. A valid extension number is indicated by the return 'DB_KZP_TLN'. The loden of the target party is retrieved.

If the addressing is by agent logon-id, then the logon-id digits are collected. After the agent's logon-id number is collected, the loden of the device using that logon-id is determined.

A check is made to determine if the target agent has the proper classmark to be monitored. Otherwise negative acknowledgement tone is connected and a **NOT AUTHORIZED** display is sent to the supervisor's set.

If the agent is properly classmarked, the 'ACD_MONITOR_ACT' attribute is set on in the dev_attribute field and the loden of the monitoring party is stored in the 'MONITOR_LODEN' field of the DYNAMIC_DEVICE table of the target party. DB_GEN_ATTR_WHISANN_ACTIVE attribute is set on in the monitor CPB.

The loden of the target party is stored in the 'MONITORED_LODEN' field of the CP_DYNAMIC_DEVICE table of the monitoring party.

The call status of the target party is now evaluated to determine whether a monitor call can be immediately established.

If the current call status of the target party does not permit a monitor call to be immediately established, the monitoring device enters into a special call state - 'MONITORING_PTY_WAIT', DB_CP_CDSA640 (or DB_CP_CLS640 if anate).

If the current call status of the target party allows the monitor call to be established (call is a 'MONITORABLE CALL'), a monitoring conference call is established between the monitoring party, the target party, and the non target party.

A 'MONITORABLE CALL' is defined as follows:

1) The call is in a stable two party talk call condition. This precludes all non talk conditions such as ringing, ringback, dialing, etc. This also precludes all multiparty call conditions such as consultation and all forms of conferencing.
2) The attendant is not a member of the two party call.
3) The call is not any type of DATA call.
4) The DB_GEN_ATTR_GEST_ZUST attribute is set in the GENERAL_ATTRIBUTES field of the CPB.
5) The parties in the call must be in one of the call processing call states as indicated in the following table.

DEVICE TYPE	MONITORABLE STATE	TARGET STATE WHILE MONITORED (WHISPERED)	NON TARGET STATE WHILE MONITORED (WHISPERED)
ANATE	DB_CP_CLS500DB_CP_CLS520	DB_CP_CLS541DB_CP_CLS542	DB_CP_CLS5
DIGITE / Phan / KS / SEKR	DB_CP_CDSA500T	DB_CP_CDSA541T	DB_CP_CDSA542T
Funct device	DB_CP_CSF500	Not Allowed	DB_CP_CSF542
ANALOG trunks	DB_CP_CTS500	Not Allowed	DB_CP_CTS542_NM
CORNET	DB_CP_CNW500	Not Allowed	DB_CP_CNW542_NM

The monitoring party is responsible for allocating the needed resources (conference cells, common cpb, and all paths) to establish the monitor conference call. When all of the resources have been allocated, the monitoring party sends a 'MONITOR_BEG' event to the target party.

When the target party receives the 'MONITOR_BEG' event, the target party sends a 'PARTN_MON_BEG' event to the non-targeted member in the call.

The processing to set up the whisper monitor call is essentially similar as that for establishing a silent monitor call using an override conference call with three parties: monitoring party, target and non target. No override tone is connected to the conference cell.

Feature activation:

1) The monitoring party's speech connection is a full path connection to the monitoring conference. The monitoring party enters a 'MONITOR TALK' DB_CP_CDSA540T (or DB_CP_CLS540 if anate) call state.
2) The target speech connection is a full patch connection to the monitoring conference. The target enters a 'MONITORED PARTY TALK' call state.

3) The non target's speech connection is a half path connection (LISTEN ONLY) to its partner (target). Non target enters a 'NON MONITORED TALK' call state.

12.4.3.2 Breakdown of Whisper monitor Connection - Monitoring Party

The system ignores certain actions initiated by the monitoring party, i.e., digit events.

The system responds by displaying the **NOT POSSIBLE** message for five seconds when the monitoring party presses a key which signals a flash (either the FLASH_KEY or a feature key that produces the same result) in an attempt to activate a feature. The call state remains intact.

An 'ON HOOK' by the MONITORING PARTY when in the 'MONITORING_TALK' call state causes an immediate breakdown of the whisper monitor connection and deactivation of the Whisper Announcement feature. The target and its partner are returned to the call states that existed prior to the whisper monitor connection.

The MONITORING PARTY is not able to receive incoming calls or to answer any call. The MONITORING PARTY is not in an "IDLE" call state.

12.4.3.3 Breakdown of Whisper Monitor Connection - Monitored Party / Non-Monitored Party

Any action initiated by or event received by the MONITORED PARTY or NON MONITORED PARTY results in the immediate dismantling of the monitor call connection. The MONITORING PARTY enters into the 'MONITOR PARTY WAIT' state. The MONITORED PARTY and NON MONITORED PARTY returns to the call state that existed prior to entering the monitor call state before the action or event is processed.

12.4.3.4 Breakdown of Whisper monitor Connection - Monitor Party Wait State

The system shall ignore certain actions initiated by the monitoring party (i.e., digit events) when in the 'MONITOR PARTY WAIT' state.

The system responds by displaying the **NOT POSSIBLE** message for five seconds when the monitoring party presses a key which signals a flash (either the FLASH_KEY or a feature key that produces the same result) in an attempt to activate a feature when in the 'MONITOR PARTY WAIT' state. The call state remains intact.

An 'ON HOOK' by the MONITORING PARTY when in 'MONITOR PARTY WAIT' state results in the immediate deactivation of the whisper monitor feature.

12.4.3.5 Reestablishing the Whisper Monitor Connection.

Whenever the MONITORED PARTY enters into a MONITORABLE call connection, it sends a 'MONITOR_RESUME' event to the MONITORING

PARTY. This event causes the MONITORING PARTY to reestablish the whisper monitor connection.

12.4.3.6 Whisper Announcement Feature and Whisper Monitor Connections over a CC Soft Restart

The Whisper Monitor Connection shall not be saved over a CC soft restart. The Whisper Announcement feature shall not be saved over a CC soft restart.

12.4.4 Administration

Activate Whisper Announcement in the system

```
CHA-ZANDE:TYPE=ACD,WHISANN=YES;
```

Configure digit analysis results

This allows Whisper Announcement to be activated using a speed dial code.

```
ADD-WABE:CD=xxx,DAR=WHISANN;
```

CD	-->	Number used to activate the feature on the supervisor telephone
DAR=WHISANN	-->	Whisper Announcement

Only extensions with the corresponding authorization can be used for monitoring purposes.

Authorize the supervisor to monitor and whisper agent calls.

Call monitoring must be activated individually for each agent.

```
CHA-SDAT:STNO=AgentNr,TYPE=ATTRIBUT,
AATTR=CBSTMON;
```

STNO	-->	Number of member for which monitoring is authorized
AATTR=CBSTMON	-->	Configures an attribute: The agent's calls may be monitored

Authorize the supervisor for monitoring

Monitoring authorization must be defined individually for each supervisor.

```
CHA-SDAT:STNO=SupervisorNr,TYPE=ATTRIBUT,
AATTR=CASTMON;
```

STNO	-->	Supervisor member number
AATTR=CASTMON	-->	The station is authorized to monitor agent calls

Define a Whisper Announcement key for the supervisor station.

```
CHA-TAPRO: STNO=SupervisorNr,KYxy=WHISANN;
```

Define whether the agent's ID or number must be entered in order to activate monitoring.

```
CHA-ACDSD:TYPE=SYS,AGTTARGT=EXT and ID
```

AGTTARGT=EXT	-->	to monitor agent calls, the EXTENSION is entered
AGTTARGT=ID	-->	to monitor agent calls, the AGENT ID is entered

Monitor a call

1) Do one of the following actions on a telephone authorized for monitoring:

a) Ppress the Whisper Announcement key

or

b) Enter the code for Whisper Announcement.

2) Enter the processor number of the agent whose calls you wish to monitor:

a) If AMO ACDSD, TYPE=SYS, AGTTARGT=ID was used to define that the agent ID is to be used:

ENTER LOGON ID

b) If AMO ACDSD, TYPE=SYS, AGTTARGT=EXT was used to define that the agent number is to be used:

ENTER STATION NO.

3) When a correct processor number is entered but

a) monitoring is not authorized for this agent, the function is aborted and the message **NOT AUTHORIZED** is output.

b) this agent is already being monitored by another supervisor, the function is also aborted and the message 'NOT POSSIBLE' is output.

12.4.5 Restrictions

The feature can be used in boss/secretary arrangements for a discreet call announce. In this case the feature must be activated by entering extension of target, therefore ACTTARGET=EXT must be set in AMO ACDSD, TYPE=SYS.

It is recommended that the target shouldn't be an ANATE, because in this case there is a noticeable hardware echo which allows the partner to softly hear the supervisor whispering.

13 Applications

13.1 Announcement Unit

The announcement unit is assigned on the TMOM module. Any number of lines circuits may be configured for one device, which are combined on the announcement unit.

13.1.1 Assignment of Announcement Unit for General Text (internal)

- Assign TMOM module

  ```
  AD-BCSU:MTYPE=PER,LTU=number,SLOT=number,
  PARTNO=string;
  ```
- Assign code for announcement unit (internal)
  ```
  AD-WABE:CD=key-num,DAR=ANSINT;
  ```
- Add class of trunk
  ```
  AD-COT:PAR=NTON;
  ```
- Add class of parameter
  ```
  AD-COP:PAR=SACK&LSUP;
  ```
- Add trunk group
  ```
  AD-BUEND:NO=number;
  ```
- Add trunk circuit

  ```
  AD-TSCSU:COTNO=number,TGRP=number,DEV=RA,
  COPNO=number,SUPV=SUPV2,ACKT=SZACK2;
  ```
- Assign a route to the announcement unit

  ```
  AD-RICHT:TYPE=CD,CD=key-num,SVC=VCE,TGRP1=number;
  ```
- Set timers (seconds)
  ```
  CHA-DTIM1:TYPEDH=TCOM,RATX= *.;
  ```

  *) The time must be set so that it is twice as long as the announcement text. If several announcement units are used, the longest text must be used as a reference.

13.1.2 Announcement Unit for Greeting Text and General Text

If announcements are required for incoming CO trunk calls as well, 2 announcement units must be connected: one unit for the company greeting, and the second one for the announcement. To make sure that a line to the unit with the announcement text is free after the greeting, 2 trunk groups are assigned for the announcement unit: one group which is seized only internally and one group which is seized externally after the greeting text. The code for external and internal seizure is the same, but it leads to different digit analysis results in the dial plan for different CPSs.

Assign an announcement unit for greeting text

- Assign a TMOM module

```
AD-BCSU:MTYPE=PER,LTU=number,SLOT=number,
PARTNO=string;
```

- Assign identical code for greeting and announcement text

```
AD-WABE:CD=key-num,DAR=ANSCO;

AD-WABE:CD=key-num,DAR=ANSINT;
```

- Add class of trunk
  `AD-COT:PAR=NTON;`
- Add class of parameter
  `AD-COP:PAR=SACK&LSUP;`
- Add trunk group
  `AD-BUEND:NO=number;`
- Add trunk circuit

```
AD-TSCSU:COTNO=number,DEV=ANS,COPNO=number;

EINR-TSCSU:COTNR=number,BUNR=number,GER=ANSEA,
COPNR=number,SUPV=SUPV2,ACKT=SZACK2;
```

- Assign a route for the greeting text unit. The CPSs must be specified, since the code leads to different digit analysis results in the DPLN.

```
AD-RICHT:TYPE=CD,CD=key-num,CPS=6,SVC=VCE,
TGRP1=number,CPAR=ANN;
```

- Set timers (seconds)

```
CHA-DTIM1:TYPEDH=TCOM,RASTA= *1),RECAMDLY= *2.;
```

*1. Set time for text length in seconds (must be longer than the greeting text).

*2. Time for waiting for start of greeting text in seconds (must be approximately as long as the greeting text). A ringing tone is sent until the text begins. If the timer expires before zero passage, i.e. the set time is too short, the connection is released.

Assign an announcement unit for announcement text (after greeting text)

- The configuration data, class of trunk and class of line parameters are assigned as for the greeting text unit.
- Assign two trunk groups

```
AD-BUEND:TGRP=zz,NO=number;

AD-BUEND:TGRP=yy,NO=number;
```

- Assign the trunk circuits (as many as required)

```
AD-TSCSU:NO=number,COTNO=number,TGRP=number,
DEV=RA,COPNO=number,SUPV=SUPV2,ACKT=SZACK2;
```

- Assign a route to the announcement unit

  The trunks are assigned to the two trunk groups. The CPS values must be specified as follows.

```
AD-RICHT:TYPE=CD,CD=key-num,CPS=5&8&9,SVC=VCE,
TGRP1=zz,CPAR=RATGRP,TGRP2=yy ,CPAR=NONE;
```

```
(CPS 10&11&12 are only for tie-traffic.)
```

- Set timers (seconds)
  `CHA-DTIM1:TYPEDH=TCOM,RATX= *.;`

  *) The time must be set so that it is twice as long as the announcement text. If several announcement units are used, the longest text must be used as a reference.

13.2 Music Source External

13.2.1 Feature Description

This feature is used to replace standard announcements or SIU signaling tones injected for stations on hold by individual announcement injections from external announcement devices. Configure one announcement device on a SLMA/ SLMA1 board per LTG. You can assign between one and sixteen CP tones to this device.

The connection is configured using AMO SSC, TYPE=EXTANN. You must specify a PEN both when assigning the CP tones and per line. You can also assign further CP tones (max. 16)

13.2.2 Generation (Example)

Configure connections for local announcement and attendant intercept:
`ADD-SSC:TYPE=EXTANN,CPCALL=LOCANN&ANNICPT;`

Expand the CP tone assignment (per LTG) by the internal dialing tone:
`ADD-SSC:TYPE=EXTANN,CPCALL=INTDTN;`

Delete the CP tone assignment (e.g. internal dialing tone):
`DEL-SSC:TYPE=EXTANN,CPCALL=INTDTN;`

13.2.3 Service Information

- Deletion is performed automatically in every LTG. Deleting the last tone assigned also deletes the configured connection.
- If a tone assignment (CPCALL in the TONTBL) is activated in the AMO ZAND - after a EXTANN has already been assigned via AMO SCC, a soft restart is required in the BP to reactivate the SSC configuration.

13.2.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
SSC	TYP	d	Typ der Ausgabe (EXTANS für externes Ansagegerät)

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	TYPE	e	Special Station Type (EXTANN for external announcement)
	CPTON	d	Anlagenton (z.B: interner Wählton: WTONINT)
	CPCALL	e	Signal (e.g. internal dial tone: INTDTN)

13.3 Synchronized Announcements

13.3.1 General

Synchronized announcements are used for providing callers with a specific sequence of information prompts in order to achieve specific reactions. This is dependent on the call progress/traffic situation of the incoming call.

The prompts/announcements are achieved by connecting external announcement units to TMOM2 boards. Each prompt or announcement is heard from the beginning. Up to 50 callers can listen to an announcement at any one time. If more than 50 callers are to be able to listen to the same announcement or, if the time callers spend waiting for an announcement to begin is to be minimized, then the appropriate number of additional announcement units of the required announcement type must be configured.

The attributes of an announcement are defined in a specific announcement type (= announcement name). Between 1 and 64 announcement units or tone sources can be combined to form a single announcement type. This is done by configuring the TMOM2 Q2214-X boards for synchronized announcement units (RAS), and assigning them to the same announcement type. Up to 64 announcement types can be configured, provided each announcement type is only assigned 1 announcement unit or tone source.

Synchronized announcements can only be connected in certain call processing situations. The situations are defined by the reasons for the announcements. Presently, the following announcements are configured:

- hold-the-line announcement for call to an AC
- announcement for calls to multiple paging equipment
- announcement for calls to a hunting group call queue
- announcement for calls to busy station for suffix dialing
- announcement for calls to busy station with attendant intercept
- announcement for calls to free station for suffix dialing
- announcement for calls to free station with or without attendant intercept
- announcement for calls to busy station with automatic camp on
- announcement for DDI with incoming call from analog CO
- announcement for internal caller if the call is forwarded to CO

Synchronized announcements are cross-LTG.

The attributes of an announcement type consist of:

- Name:
  - can be freely assigned
  - up to 20 characters
- Status:
  - on or off.
- Repeats:
  - number of times the announcement cycle is to be repeated.
- Linked announcements:
  - announcement type to continue after completion of current announcement cycle.
- Operating mode:
  - Continuous or Start/Stop
- Announcement delay timer:
  - only applies if operating mode is Start/Stop. This value defines the delay time before the announcement is started, following seizure by the first caller.
- Idle release limit:
  - only applies if operating mode is Continuous. This value defines the number of times an announcement cycle is to be repeated under no-load conditions before the announcement unit is switched off.
- Type of first internal tone:
  - This tone type defines the tone which is to be applied at the end of the announcement text.
- Duration of first internal tone:
  - can be set as required
- Status of first internal tone:
  - on or off.
- Type of second internal tone:
  - This tone type defines the tone which is to be applied after the first internal tone, or, if no first internal tone is applied, at the end of the announcement text.
- Duration of second internal tone:
  - can be set as required
- Status of second internal tone:
  - on or off.
- Type of third internal tone:
  - This tone type defines the tone which is to be applied after the first or second internal tone. If a first or second internal tone is not applied, it defines the tone to be applied at the end of the announcement text.
- Duration of third internal tone:
  - can be set as required
- Status of third internal tone:
  - on or off.

A synchronized announcement will run until interrupted by an external action (call release or answer etc.), or until it terminates itself, depending on the

announcement type attributes defined. In the latter case, a return tone (exit tone) is applied. This tone must be defined for each announcement reason.

The selection of a particular announcement type depending on the call progress situation/internal traffic restriction matrix is configured via AMO SYNCA, by means of an Announcement Reason / Announcement Type table.

Short announcements can be run in CONTINUOUS operating mode (i.e. looped). The waiting time for callers before the start of an announcement text can be bridged with the entry tone, which must be defined for each announcement type.

Longer announcements (from approx. 10 seconds onward) should be run in START/STOP mode, since callers would otherwise have to wait too long before hearing the start of an announcement text. However, this can only be done if the announcement unit has a start/stop input. In this mode, the system searches for an idle announcement unit assigned to the announcement type and starts playback.

Wait times may differ from case to case in the CONTINUOUS operating mode, and may even be as long as the announcement. However, you can minimize wait times in the START/STOP operating mode by connecting several announcement units and by selecting the correct announcement delay time in relation to the text length.

Use the following example to calculate the optimum size of the synchronized announcement with regard for the shortest wait time for text start by optimizing the announcement length.

The text length of the first active announcement unit must be covered by the result of the start delay time and the number of additional announcement units.

Ergo: Text length = start delay time multiplied by the number of announcement units.

Example:

Text length	::	40 sec
Start delay time	::	5 sec/10 sec/20 sec
Number of announcement units	::	8 / 4 / 2

In figures:

40 sec	=	5 sec multiplied by 8 or
		10 sec multiplied by 4 or
		20 sec multiplied by 2 or ...

The number of necessary announcement units in relation to the set delay time results from the following formula:

number of announcement units	=	text length / start delay time + 1

In figures:

Number of announcement units	=	40 sec /5 sec + 1 = 8 + 1 = 9 or
	=	40 sec / 10 sec + 1 = 4 + 1 = 5 or
	=	40 sec / 20 sec + 1 = 2 + 1 = 3 or ...

If this procedure is used

- the maximum possible wait time for text start is always equal to the set start delay time.
- the average wait time for text start is equal to half the maximum possible wait time.

The value combination you use depends on the number of announcement units you require (matter of costs) to reduce the wait times for text start to a justifiable value.

The delay timer is necessary in order to avoid having to start a separate announcement unit for each caller. This allows up to 50 callers to be connected to the same announcement unit, provided they all call within the start delay time. In this operating mode, if an idle announcement unit cannot be found for an announcement type, the system switches to CONTINUOUS mode until an announcement unit becomes idle again. This means that any caller(s) will have to wait for the beginning of the announcement text, i.e. despite START/STOP operation the wait times are irregular in length.

In this case, the system can output diagnosis advisory messages, in order to allow system owners to react to the problem by expanding the system if necessary. For this, bit 11 of the diagnosis bit string must be set with the aid of the DIAGS AMO. This information will enable you to reconfigure your system and to avoid the bottle neck.

If you wish to operate an announcement unit in asynchronous mode, you must set the new parameter ANOD in the COT of the TMOM board to which the announcement unit is connected. In this case, callers will be switched to an announcement unit without delay. This is useful if the announcement to be switched is a looped announcement, e.g. please hold the line with background music, where a start of text signal is not required.

For this type of operation (without start-of-text recognition), announcement units can also be connected to TMOM via the a/b wires only. The c- and d-wires must be bridged in order to avoid a line alarm. In addition, the new parameter AANT must be set in the COP of the TMOM lines.

- COT parameter value = ANOD (asynchronous operation)
- COP parameter value = AANT (connection via a/b wires only)

You must set the operating mode to START/STOP for this type of connection, since the TMOM circuit will otherwise not be released when required. (If you set the operating mode to CONTINUOUS, the TMOM circuit would normally be released when the release limit is reached. However, since no text repetitions can be defined, this is not possible).

For start and stop control via the TMOM board, the p-wire and j-wire can be additionally connected.

You can also install and operate the synchronized announcement for the application "wait announcement on the AC" in the CAC node. Installation in all originating nodes is therefore no longer necessary. Prerequisites are:

Set the COT parameters WAAN and ABPD for the tie line to the CAC node, even if the calling party in the originating switch is an analog trunk. The digit in last position in the CAC's attendant code (satellite PBX: AMO-NAVAR, last digit CD- CASEXT) is entered in the branch ANNMCI in the AMO-SYNCA. In addition, you must set the COT parameter ABNA, if the synchronized announcement in the CAC node is only to be started, when the attendant console is in night service.

You can operate a new announcement, if a digital trunk with external traffic performs automatic camp-on on a Digite, Anate or functional station. For this, configure and assign an announcement type for the new announcement reason "Announcement with automatic camp on".

You can operate a synchronized announcement for analog trunks with automatic camp-on on a Digite or Anate. The announcement is also activated for a transfer during camp on.

You can have different wait announcements at the AC for day and night operation. For this purpose, the additional announcement reason "Wait announcement on AC no answer with night service" (WANNDNS) was implemented for both local ACs and the CAC. With a CAC the TMOM connection and the CAC can be located in different nodes.

If no special administrative settings are made for night service, the day service settings also apply for night service.

You can also use the ITR of the night station to determine the announcement type for wait announcements at the AC during night operation if these were configured in the same node as the announcement unit.

Synchronized announcement can also be used for three applications, provided the calling device has the COS for synchronized announcement (COS=ANSYN) and is not an AC. Each of these three application cases must be released using AMO ZAND. If you want third-party systems to hear the synchronized announcement, set the COT parameter **SANH** in the incoming tie lie. The three possible application cases are:

- no answer on AC (day and night service)
  `CHA-ZAND:TYPE=ATND,ISYNCAC=YES;`
- call to CSM (CSM with MEETME)
  `CHA-ZAND:TYPE=CCM,ISYNCCCM=YES;`
- call to a hunting group call queue.
  `CHA-ZAND:TYPE=ALLDATA2,ISYNCHG=YES;`

  Synchronized announcement can be remotely operated for
- call to CSM (CSM with MEETME) and
- call to a hunting group call queue

The announcement need therefore not be configured in the same node as the hunting group or the CSM. Instead, the announcement can be configured in the originating node for these application cases.

Any discrepancies within the network when setting the remote operation of the synchronized announcement can be avoided by setting the COT parameter TNDV (tone is injected from the station) for the outgoing digital tie trunk.

Remote operation of the synchronized announcement are generally prohibited for other applications (Announcement with station no answer), if this COT parameter is not set.

It is also possible to administrate up to 999 different station numbers between 1 and 6 digits as an alternative to the administration of the company index. Use the corresponding switch setting in AMO ZAND to select one of the two variants.

AMO ZAND: TYPE = ATND, COMP1000 = YES

IMPORTANT: When you switch to 1000 company announcements for the first time, you must regenerate the existing data for the AC DAR.

You can also use the announcement for transfer purposes for the applications "Announcement with PSM" and "Announcement with camp-on". This option is also available for the application "Announcements for Hunting Group Call Queue". The position of the hunt group, the announcement unit or the transferring party in the network is not important.

You can also use the synchronized announcement for the individual night service (AMO ZAND: TYPE = ATND, INIGHT = YES) if you set a subscriber call number for the trunk as an individual night station (AMO TDCSU: INIGHT = nnnnn).

The announcement type determined in the originating node can be transported via the CAC traffic to the CAC node and used there for connection. Up until now, if the announcement unit was configured in the CAC node, the announcement type was also determined in this node. In certain applications, the relevant information was not available to determine the correct announcement type.

You cannot set a different entry tone or exit tone, however, with this procedure. The tone settings made in the CAC node for the announcement reason WANNAOHK or WANNDNS apply here.

If you want to use this procedure, follow the rules listed here:

- Ensure that the announcement type information unit is consistent throughout the entire OpenScape4000/HiPath 4000 network.
- Configure the synchronous announcement in all OpenScape 4000 nodes as if you wanted to operate the announcement locally. However, you only have to configure the TMOM2 board in the CAC node and assign the announcement type to the board (AMO TSCSU).
- Set the COT parameter SATR for all trunks used to reach the CAC node from the originating node.

13.3.2 Connecting Announcement Units

Possible announcement units are the Musifone multimax from Bayer and the Genius ST from Speech Design. All these devices can be run in CONTINUOUS or START/STOP mode. The predecessor of Musiphone multimax was

Musiphone 5000 S. The following section describes how to connect these devices to the TMOM2 board.

- Musifone 5000 S:

  This device has a text memory for announcements between 32 and 320 secs.

  If you are using the Bayer Musifone 5000 S, you should use the following settings:

  - CONTINUOUS operating mode: Functional setting = 4, Operating mode setting = 8.

  - START/STOP operating mode: Functional setting = 4, Operating mode setting = 9.

  The following diagram shows the announcement unit connected to circuit 0 of the TMOM board in START/STOP mode.

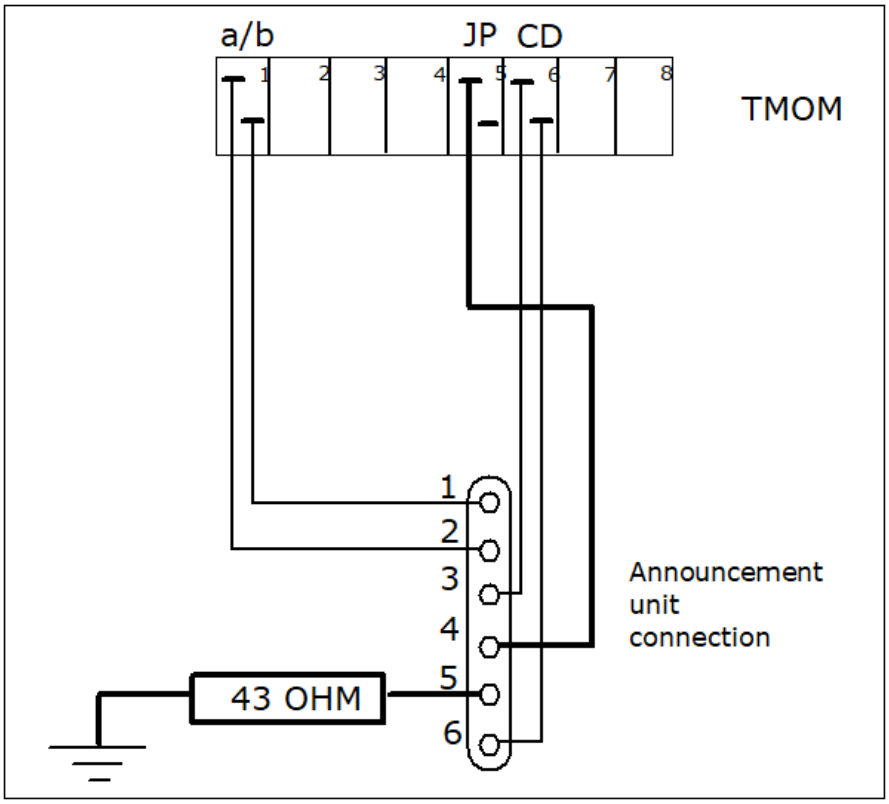


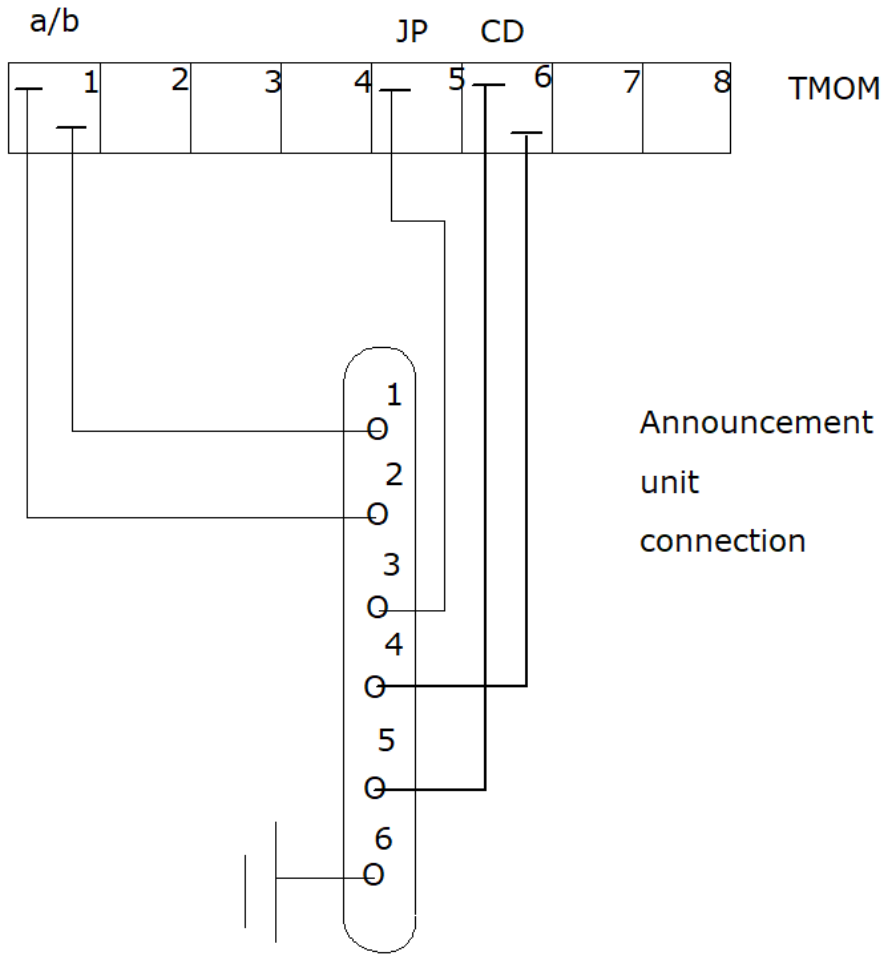
Figure 126: TMOM Connection Musiphone 5000 S

If the announcement unit is to be run in CONTINUOUS mode, the TMOM input JP does not need to be wired (bold lines). In order for the announcement unit to repeat automatically, pins 4 and 5 of the announcement unit interface must be bridged.

- Musiphone multimax

  This device is a further development of the Musifone 5000 S. It has 8 independent text memories.

  The following diagram shows the announcement unit connected to circuit 0 of the TMOM board in START/STOP mode.



TMOM connection to Musiphone multimax

- Genius ST:

  This device has 2-4 independent text memories. Text 1 can be up to 3 minutes in length; all other texts can be max. 32 seconds long.

  No changes to the DIP switch settings are necessary.

  - CONTINUOUS operating mode:

  Activate the used text memories manually with the appropriate buttons. The announcements are then played back continuously in looped mode.

  - START/STOP operating mode:

  Do not activate the text memories manually.

  The following diagram shows the announcement unit connected to circuit 0 of the TMOM board in START/STOP mode.

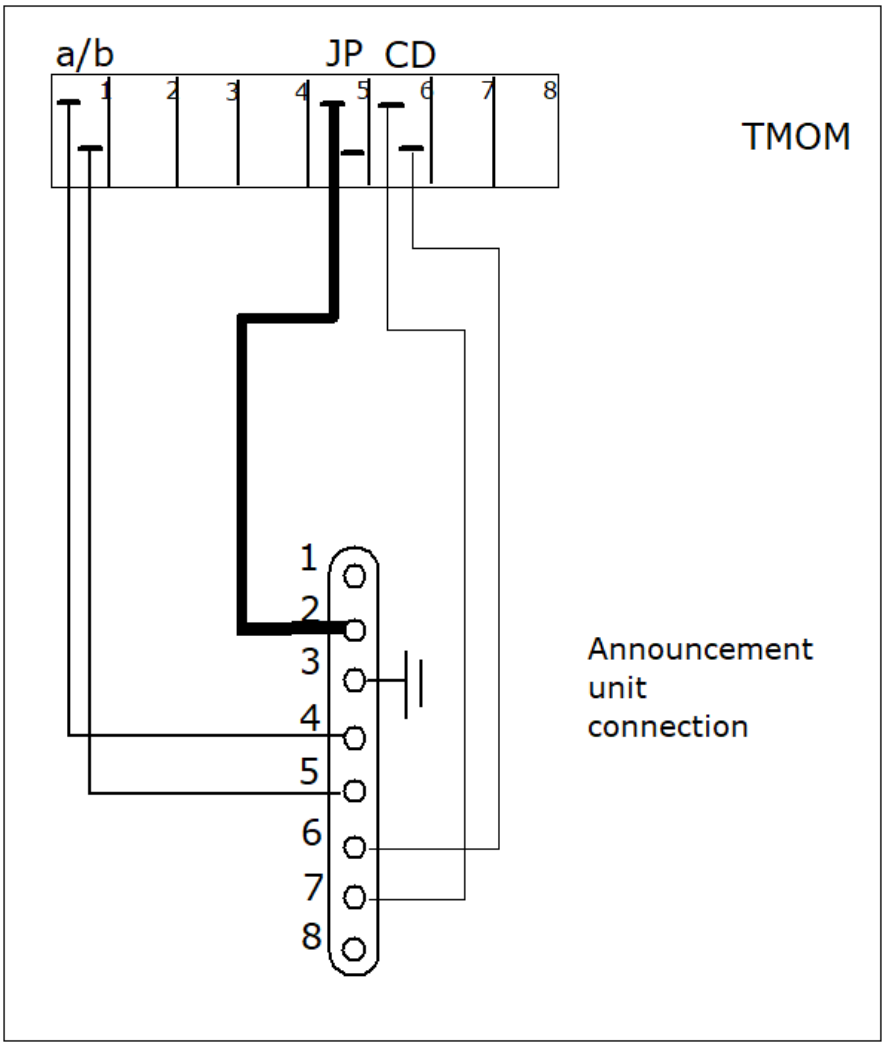


Figure 127: TMOM Connection Genius ST

If the announcement unit is to be run in CONTINUOUS mode, the TMOM input JP does not need to be wired (bold lines).

13.3.2.1 Prerequisites, Interrelationships

AMO - ZAND	Required for enabling the synchronized announcements feature; also for enabling the feature synchronized announcements for CCM calls. Also required for enabling the synchronized announcements feature for "No answer on AC", for "Call to CSM" and for "Call to hunting group".	
AMO - VFGR	Required for marking all ATND groups with a synchronized announcement service for callers.	
AMO - SA	Required for marking all hunt groups with a synchronized announcement service for callers waiting in the call queue.	
AMO - DIMSU	Required for defining the number of available announcement buffers. This value also defines the total number of lines in a particular node which can be switched to an announcement unit at the same time.	
AMO - CTIME	Required for defining the start time of an announcement if calls rung at the attendant console are not answered. Required for defining the timeout after seizure of a station to either start the announcement for suffix dialing or "Station no answer".	
AMO - DTIM1	Required for defining the maximum delay time before the beginning of the announcement is heard after the announcement unit is activated, and for defining the maximum delay time before the beginning of the next announcement in the chain is heard. Attention: With Genius ST in the text memory from 1 to 3 minutes!	
AMO - COT	Required for defining the additional COT parameters necessary for allowing callers to be switched to synchronized announcements.	
	for asynchronous operation:	ANOD (for TMOM circuit)
	for announcements at the attendant console:	WAAN (for calling circuit)
	for announcements at an SA AO	ANHT&BSHT (for calling circuit)
	for announcements with busy station:	ABNA&IBSY (for calling circuit)
	for announcements for camp on	ABNA&KNDI (for calling circuit)
	for announcements for station no answer:	ABNA &(IFR) (for calling circuit)

	for announcements suffix dialing station busy:	PDOB (for calling circuit)
	for announcements suffix dialing station no answer:	PDOT (for calling circuit)
	for announcements for DDI:	RDDI (for calling circuit)
	for announcements for third-party systems:	SANH (for calling circuit)
	for announcements with PSM:	APSM (for calling circuit)
	for answering before suffix-dialing or announcement:	ABPD (for calling circuit)
	for transporting the announcement type to the CAC node	SATR (for calling circuit)
AMO - COP	The COP parameter set in TSCSU for the TMOM board must contain the parameters SACK and LSUP. If an announcement is operated in asynchronized mode (with a/b wires only) the COP parameter AANT must be set.	
AMO-COSSU	Set the COS ANSYN for the terminal which is to hear the synchronized announcement.	
AMO - TSCSU	Once the announcement types have been defined, the TSCSU AMO must be used to configure the TMOM board as a RAS and assign the appropriate announcement type.	
AMO - SYNCA	Configure the announcement type. Assign an entry tone and exit tone to an announcement reason. Define, whether you reach the announcement either by ITR or the last dialed number (for hold-the-line announcement at AC).	
AMO - LDAT	Required for enabling the synchronized announcements feature for calls which are forwarded outside of customer's network by usage of SYNCA reason ANREASON=FWDOUT Parameter to be used under AMO LDAT of CO trunk: LATTR=FWDOUT	

Example 1: Hold-the-line Announcement at the AC

The Meier company can be reached via ATND group 2. If calls are not answered within a defined time, callers are to hear the first in a series of announcements. This announcement is to be repeated once. If the call has still not been answered at the end of the second repeat, the caller is to be switched to a further announcement, which will then be continuously repeated (looped), until the call is finally answered (or the caller hangs up). The text announcements should be interrupted by 10 seconds of music and 20 seconds of PLEASE_HOLD_THE_LINE. The first announcement is to be configured in START/STOP mode, with a start delay time of 3 seconds. The second

announcement is to be set up in CONTINUOUS mode, with a no-load release value of 5 repeats.

ATNDGR 2 is marked as 'with synchronized announcements'. (VFGR AMO).

The last announcement type in a chain of linked announcements must always be defined first

Assign announcement type 2:

```
AD-SYNCA: ANTT,2,Meier_Inc,ON,255,,MUSIC,10,
ON,HOLDLINE,20,ON,,,, CONT,5;
```

Assign announcement type 1:

```
AD-SYNCA: ANTT,1,Meier_Inc,ON,1,2,MUSIC,10,ON,
HOLDLINE,20,ON,,,, STA_STO,3;
```

Assign entry tone/exit tone for WANNAOHK announcement reason

```
AD-SYNCA: ANNTONE,WANNAOHK,CAMP,RNGBK;
```

Create the Announcement Reason/Announcement Type table entries:

You must assign the announcement type 1 to the announcement reason WANNAOHK, depending on the ITR number or last dialed digit with which the ATND group is reached.

If an ATNDGR is reached by direct dialing, the last dialed digit (e.g. 2) is relevant.

The last digit in the attendant code is relevant for CAC (satellite PBX AMO-NAVAR,CD-CASEXT)

```
AD-SYNCA: ANNMCI,WANNOHK, <ldigit-stno-atnd-cd>, 1;

AD-SYNCA: ANNMCI,WANNAOHK, <ldigit-stno-casext>, 1;
```

Up to EV2.0 it was only possible to assign an announcement type to the last dialed digit (company index). From HV 3.0 you can assign 999 different digit sequences with up to 6 digits to one announcement type. These digits are the last dialed digits. The switch in AMO ZAND must be set to this alternative.
`CHA-ZAND: RESERVE,102, YES;`

Then enter the digit sequence (e.g. 471199).
`AD-SYNCA: ANNMCI,WANNOHK, 471199, 1;`

If the attendant group is reached via an internal FWD, FWDBSY or FNANS, the ITR number of the forwarding station is used (ITR=4). If the group is reached via an external FWD, FWDBSY or FNANS, the ITR number of the caller is used (ITR=0), since the ITR groups are not unambiguous throughout a network.

If the attendant group is reached via "attendant intercept", the ITR number is relevant. If no destination number can be determined, e.g. in the case of attendant intercept due to misdialing or because the station is not authorized for direct inward dialing, the ITR number of the caller is used (ITR-A-STN).
`AD-SYNCA: ANNMITR,WANNAOHK, <ITR_A_STN>, 1;`

and
`AD-SYNCA: ANNMITR,WANNAOHK, <ITR-FWD-STN>, 1;`

If an internal destination (internal user or internal hunting group) can be determined, the ITR number of the internal user or hunting group master is used

(ITR = 3). If the destination number is an external number, the ITR number of the caller is used.

```
AD-SYNCA: ANNMITR,WANNAOHK,<ITR-DEST>, 1;
```

If you want to activate a synchronized announcement for terminals you must enable the internal application using AMO ZAND

```
CHA-ZAND: TYPE = ATND,ISYNCAC=YES;
```

When you assign a COS, you select the user who should hear the synchronous announcement.

```
CHA-COSSU: TYPE = COS, COS = <ITR-A-STN>,
AVCE = ANSYN;
```

Example 2: Announcement with PSM

Callers to the multiple code-calling system CCM are to hear an announcement. The announcement is not to be repeated. After the announcement, the CCM hold tone is to be fed in for as long as possible. The call waiting tone (knocking/ camp-on tone) is to be defined as the entry tone, and the ringback tone is to be defined as the exit tone. The required operating mode is START/STOP, and an announcement start delay timer of 2 seconds is to be set.

Synchronized announcements for CCM callers are currently only possible if the announcement unit and the CCM are in the same node. Remote applications are also supported in EV 3.0 and higher.

Use the ZAND AMO to enable synchronized announcements for CCM callers. Parallel ringing and synchronous announcement are possible at the same time. You must disable parallel ringing before you can activate the synchronous announcement for call forwarding on no reply or call forwarding.

```
CHA-ZAND: TYPE = CCM, SYNCACCM = YES, STNRNG = NO;
```

Set the APSM parameter in the calling circuit's COT.

```
CHA-COT: COTNO = <number>, COTTYPE = COTADD,
PAR = APSM
```

Assign announcement type 4:

```
AD-SYNCA: ANTT,2,Meier_Inc,ON,,,HOLDCCS,255,ON,,,,,,,
STA_STO,2;
```

Assign entry tone/exit tone for ANNCCM announcement reason

```
AD-SYNCA: ANNTONE,ANCCM,CAMP,RNGBK;
```

Assign announcement reason/announcement type table: Depending on the ITR code number of the incoming call, the announcement type 4 must be assigned to the announcement reason ANNCCM 4. The ITR numbers used depend on the types of call situation for which the announcement is required.

If the CCM is reached by direct dialing, and the code-calling number dialed belongs to an internal user, the called user's ITR (5) is used.

```
AD-SYNCA: ANNMITR,ANCCM, <ITR-SEARCHNO-STN>,4;
```

If the code-calling number dialed belongs to an external user, the calling user's ITR (7) is used.

```
AD-SYNCA: ANNMITR,ANCCM,7,4;
```

If the CCM is reached via call forwarding/forwarding on no answer after dialing an internal user's number, the ITR of the internal (forwarding) user (8) is used.
```
AD-SYNCA: ANNMITR,ANCCM,8,4;
```

If the CCM is reached via call forwarding/forwarding on no answer after dialing an external user's number, the caller's ITR (7) is used.

If you want to activate a synchronized announcement for terminals you must enable the internal application using AMO ZAND.
```
CHA-ZAND: TYPE = CCM,ISYNCCCM=YES;
```

When you assign a COS, you select the user who should hear the synchronous announcement.

```
CHA-COSSU: TYPE = COS, COS = <ITR-A-SEARCHER>,
AVCE = ANSYN;
```

Example 3: Announcement with Hunting Group Call Queue

Callers to a certain hunt group are to hear a synchronized announcement, if put on hold in the call queue. This announcement is to be repeated 3 times. A 15-second hunting group wait tone is to be fed in between each repeat. The ringback tone is to be used as the entry tone and exit tone. The announcement is to be operated in START/STOP mode, with an announcement start delay of 3 seconds.

Use the SA AMO to mark the hunting group as 'with synchronized announcements' .

Set up announcement type 5:

```
AD-SYNCA: ANTT,5,Meier_Inc,,ON,3,,HOLDHT,15,ON,,,,,,,
STA_STO,3;
```

Assign entry tone/exit tone for WANNHG announcement reason
```
AD-SYNCA: ANNTONE,WANNHG,RNGBK,RNGBK;
```

Assign announcement reason / announcement type table: Depending on the ITR code number of the incoming call, the announcement type 5 must be assigned to the announcement reason WANNHG. The ITR numbers used depend on the types of call situation for which the announcement is required.

If the hunting group is reached by direct dialing, the ITR number of the hunting group master or the first hunting group member is used (ITR-HT-MASTER).
```
AD-SYNCA: ANNMITR,WANNHG,7,5;
```

If the hunting group is reached via call forwarding/forwarding on no answer after dialing an internal user's number, the ITR of the internal (forwarding) user (8) is used.
```
AD-SYNCA: ANNMITR,WANNHG,8,5;
```

If the hunting group is reached via call forwarding/forwarding on no answer after dialing an external user's number, the ITR of the destination number is used (i.e. of the hunting group).

If you want to activate a synchronized announcement for terminals you must enable the internal application using AMO ZAND.
```
CHA-ZAND: TYPE = ALLDATA2,ISYNCHG=YES;
```

When you assign a COS, you select the user who should hear the synchronous announcement.

```
CHA-COSSU: TYPE = COS, COS = <ITR-A-STN>,
AVCE = ANSYN;
```

Example 4: General Announcement "Station busy"

Callers who reach busy internal stations are to hear a one-off announcement (announcement type =3). The announcement can only be set up if COT parameters with subsequent attendant intercept are set. If an announcement with subsequent attendant intercept is used, and the call is not answered by the attendant within a specific time limit, callers are to be switched to a second announcement (announcement type =5). The delay time until the call is answered by the attendant, or until the second announcement is started, is to be filled in with music. The second announcement is to start after approx. 15 seconds. After the second announcement, more music is to be fed in for another 30 seconds, followed by 10 seconds of "please hold the line". This cycle is to be repeated 3 times. Since the text of the first announcement is very short, the operating mode is to be set to CONTINUOUS, with a no-load release limit of 5 repeats. The operating mode of the second announcement is to be set to START/STOP, with a start delay time of 3 seconds. The call waiting tone (camp-on) is to be used as the entry tone, and the ringback tone as the exit tone

In this example, the second announcement (if call is not answered within a specific time after attendant intercept) cannot be reached except through the first announcement. The reason for this is that the announcements would otherwise interrupt each other. This means that the wait time for the second announcement can be influenced by the settings for the first announcement. For example, if the first announcement has a length of 4 seconds, the subsequent music feed-in must be set for 9 seconds. The actual start delay of the second announcement thus lies between 13 seconds and 17 seconds. If precise delay times are required, this can only be achieved by running the first announcement in START/STOP mode as well.

Whereas the first announcement, with subsequent attendant intercept, will always be played back in the specified situation, the second announcement will only be played if the attendant intercept destination (ATND group) is marked as "with synchronized announcements".

The synchronous announcement must be configured in the node in which it is required. For example, if an exchange call reaches an internal user via an S0/S2 transit connection, and the call is to be cleared down back to the originating node, the announcement will have to be configured in this node.

Assign announcement type 5 (second announcement):

```
AD-SYNCA:ANNTT,5,Meier_Inc,ON,3,,MUSIC,30,ON,
HOLDLINE,10,ON,,, STA_STO,3;
```

Assign announcement type 3 (first announcement):

```
AD-SYNCA: ANNTT,3,Müller_Inc,ON,,5,MUSIC,9,ON
,,,,,,,CONT,5;
```

Assign entry tone/exit tone for ANNBUSY announcement reason

```
AD-SYNCA:ANNTONE,ANNBUSY,CAMP,RNGBK;
```

Assign announcement reason/announcement type table: Depending on the ITR code number of the incoming call, the announcement type 3 must be assigned to the announcement reason ANNBUSY. The ITR numbers used depend on the types of call situation for which the announcement is required.

If the busy station is reached by direct dialing the ITR of the called station (5) is used.

```
AD-SYNCA: ANNMITR,ANNBUSY,5,3;
```

If the busy station is reached via call forwarding/forwarding on no answer after dialing an internal user's number, the ITR of the internal (forwarding) user (8) is used.

AD-SYNCA: ANNMITR,ANNBUSY,8,3;

If the busy station is reached via call forwarding/forwarding on no answer after dialing an external user's number, the ITR of the destination number is used (i.e. of the busy station).

If a call is switched to the attendant (attendant intercept) in the originating node after dialing a network number in another node, the ITR of the destination station number is also used (i.e. ATND).

This announcement cannot be used for a terminal.

Example 5: General Announcement "Station no Answer"

This is the same as example 4, except that the announcement reason is to be "no answer" as opposed to "busy". Substitute the announcement reason parameter for this example ANNBUSY by ANNOHK. Other than with the "General announcement "Station busy" this announcement is not combined with an attendant intercept. You need not set the COT parameter IFR (Intercept when no answer) in order to connect a synchronized announcement.

If the COT parameter IFR is set for the calling trunk, the announcement is interrupted for the attendant intercept. To avoid this, the size of the intercept timer must be in relation with the announcement length and to the configured value of the announcement start timer (minimum value = 5).

This announcement cannot be used for a terminal.

Example 6: General Announcement with Automatic Camp on

Calls to a station in a two-party call are to hear a synchronized announcement during automatic camp on. Set the COT parameter KNDI for automatic camp-on on a busy station. The announcement is also activated during transfer.

Assign announcement type 7 as required, e.g.:

```
AD-SYNCA: Anntt,7,Camp,On,,5,Camp,10,On,,,,,,,Stasto,2;
```

Assign the entry/exit tone for the "Anknock" announcement reason :

```
AD-SYNCA:Anntone,Anncamp,Camp,Camp;
```

Assign announcement reason/announcement type table: Set announcement type 7 for the ANKNOCK announcement reason, depending on the ITR number of the camped-on party. For DDI to a busy station the ITR (ITR =5) of the busy station is valid.

```
AD-SYNCA: Annmitr, Anncamp, 5, 7;
```

This announcement cannot be used for a terminal.

Example 7: Announcement "Station Busy with Suffix Dialing"

Callers via analog trunks who reach a busy user, but can re-route via DTMF suffix-dialing, are to hear an appropriate announcement (announcement type

11). In this case, the COT parameter IBSY must not be set. The announcement is not to be repeated, and is to be followed by 10 seconds of music. The operating mode is to be Start/Stop, with a start delay time of 3 seconds. The busy tone is to be defined as the entry tone and exit tone.

Assign announcement type 11:

```
AD-SYNCA:,ANTT,11,Meier_Inc,ON,,,MUSIC,10,ON
,,,,,,,STA_STO,3;
```

Assign entry tone/exit tone for SDBUSY announcement reason

```
AD-SYNCA:,ANNTONE,SDBUSY,BUSY,BUSY;
```

Assign announcement reason / announcement type table:

The same rules apply as for example 4, except that the announcement reason ANNBUSY must be replaced with SDBUSY instead.

Example 8: Announcement "Station no Answer with Suffix Dialing"

Callers via analog trunks with DTMF suffix dialing, who reach a station user who does not answer within a set time, are to hear an appropriate announcement. The same rules apply as for example 5, except that the announcement reason ANOHK must be replaced with SDOHK instead.

Example 9:

Calls via analog trunks without direct dialing authorization but with DDI functionality are to receive an announcement immediately after incoming trunk seizure (announcement type 12). This announcement is not to be repeated, and no further internal tones are to follow. The ringback tone is to be defined as the entry tone, and a special dialing tone as the exit tone. The operating mode is to be Start/Stop, with a start delay time of 1 second.

Assign announcement type 12:

```
AD-SYNCA:ANTT,12,Meier_Inc,ON,,,,,,,,,,,
STA_STO,1;
```

Assign entry tone/exit tone
`AD-SYNCA:ANNTONE,RNGBK,SPEC;`

Assign announcement reason/announcement type table:

For this announcement reason, there are no destination number ITRs to be used. The announcement reason must therefore be entered as dependent on the ITR number of the caller (ITR=2).
`AD-SYNCA:ANNMITR,DIDSD,2,12;`

Example 10: Wait announcement on AC with night service

The Meier company can be reached via ATND group 2. If the calls are not answered within a configurable time and the AC is switched to night service, an announcement of type 19 is to be injected. This announcement is to be repeated once. The text announcements should be interrupted by 10 seconds of music and 20 seconds of PLEASE_HOLD_THE_LINE. The first announcement is to be configured in START/STOP mode, with a start delay time of 3 seconds. For day time operation the settings in example 1 apply.

ATNDGR 2 is marked as 'with synchronized announcements'. (VFGR AMO).

Set up announcement type 19:

```
AD-SYNCA:ANNTT,19,Meier_Inc,ON,1,,,MUSIC,10,
ON,HOLDLINE,20,ON,,,, Stasto,3;
```

Assign entry tone/exit tone for WANNADNS announcement reason
```
AD-SYNCA: ANNTONE,WANNDNS,RNGBK,FRNGBK;
```

Create the Announcement Reason/Announcement Type table entries:

You must assign the announcement type 19 to the announcement reason WANNDNS, depending on the ITR number or last dialed digit with which the ATND group is reached.

If an ATNDGR is reached by direct dialing, the last dialed digit (e.g. 2) is relevant.
```
AD-SYNCA: ANNMCI,WANNDNS,2,19;
```

When night service is active at the night station, the night station's ITR is relevant (ITR_NIGHT) if the night station is in the same node as the announcement unit.

```
AD-SYNCA: ANNMITR, WANNDNS, <ITR-NIGHT>, 19
```

If the attendant group is reached via an internal FWD, FWDBSY or FNANS, the ITR number of the forwarding station is used (ITR=4). If the group is reached via an external FWD, FWDBSY or FNANS, the ITR number of the caller is used (ITR=0), since the ITR groups are not unambiguous throughout a network.

If the attendant group is reached via "attendant intercept", the ITR number is relevant. If no destination number can be determined, e.g. in the case of attendant intercept due to misdialing or because the station is not authorized for direct inward dialing, the ITR number of the caller is used (0).

```
AD-SYNCA: ANNMITR,WANNDNS, <ITR-A-STN>,
```

```
and
```

```
AD-SYNCA: ANNMITR,WANNDNS, <ITR-DEST>, 19;
```

If an internal destination (internal user or internal hunting group) can be determined, the ITR number of the internal user or hunting group master is used (ITR = 3). If the destination number is an external number, the ITR number of the caller is used.

```
AD-SYNCA: ANNMITR,WANNDNS, <ITR-DEST>, 19;
```

If you want to activate a synchronized announcement for terminals you must enable the internal application using AMO ZAND.
```
CHA-ZAND: TYPE = ATND, ISYNCAC=YES;
```

When you assign a COS, you select the user who should hear the synchronous announcement.

```
CHA-COSSU: TYPE = COS, COS = <ITR-A-STN>,
AVCE = ANSYN;
```

13.3.3 Help for Setting Synchronized Announcements

General

When using synchronized announcements wait times for the beginning of announcements should be as brief as possible for economic reasons. After all, charges are usually applied from the moment the request is entered - even before the announcement has been activated. The examples and diagrams in this document should provide some help for optimizing synchronized announcement settings.

The wait time for announcement begin depends on various events, their time sequence and also on parameter settings in SYNCA AMO.

The most influence have:

- traffic.
- length of the announcement text.
- number of announcement units allocated to an announcement type.
- set operating mode (Start/Stop or Continuous)
- set announcement delay time with Start/Stop operating mode

If the operating mode is CONTINUOUS then the wait time cannot be shortened by administrative interventions or by jumpering. Even additional announcement units will have no effect on the wait times.

Additional announcement units will only increase the number of callers for a specific announcement (50 callers more per additional announcement unit).

The CONTINUOUS operating mode results in the following unchangeable wait times:

- maximum possible wait time in individual case: length of text announcement
- average wait time: half of text length

Depending on the traffic situation, wait times can only be optimized in the START/STOP operating mode by setting a start delay time and the number of announcement units per announcement type.

If the synchronized announcement is operated in START/STOP mode and traffic shows too few announcement units per announcement, the operating mode is automatically switched to temporary CONTINUOUS mode, if no idle announcement unit can be found.

If bit 11 of the diagnosis bit string is set the system always outputs diagnosis advisory messages at the point of switch-over. These messages contain information about the capacity of individual announcement units in order to allow system owners to react to the problem.

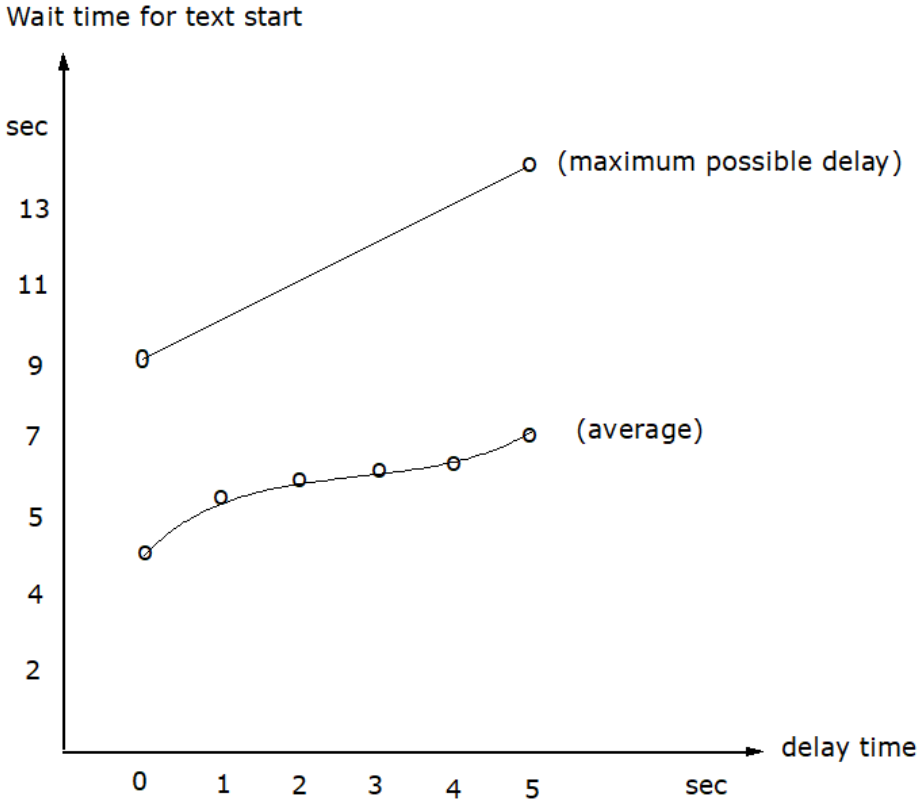
The following diagrams show the changes of wait times for certain suppositions depending on the number of announcement units (for a certain announcement type) and the selected delay time.

Suppositions:

- traffic: number of calls per sec = 1
- text length: 10 sec.
- set operating mode: Start/Stop

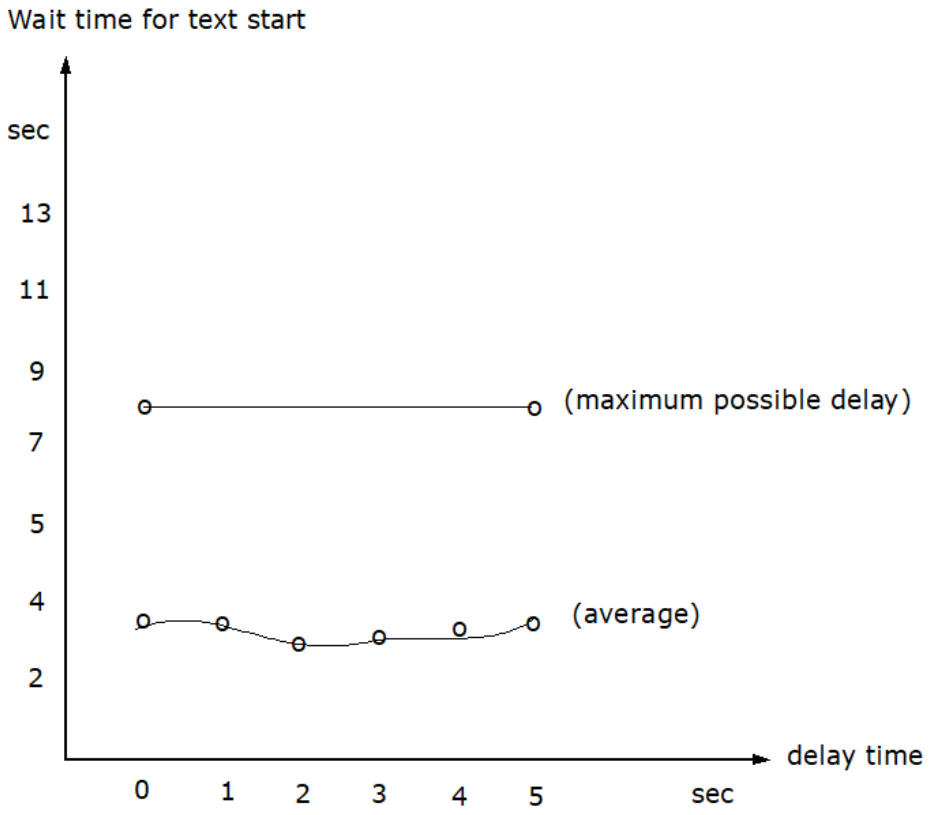
Actions:

- modification of start delay time: (0 - 1 - 2 - 3 - 4 - 5) sec
- connection of announcement units for an announcement type: (1 - 2 - 3 - 4) units



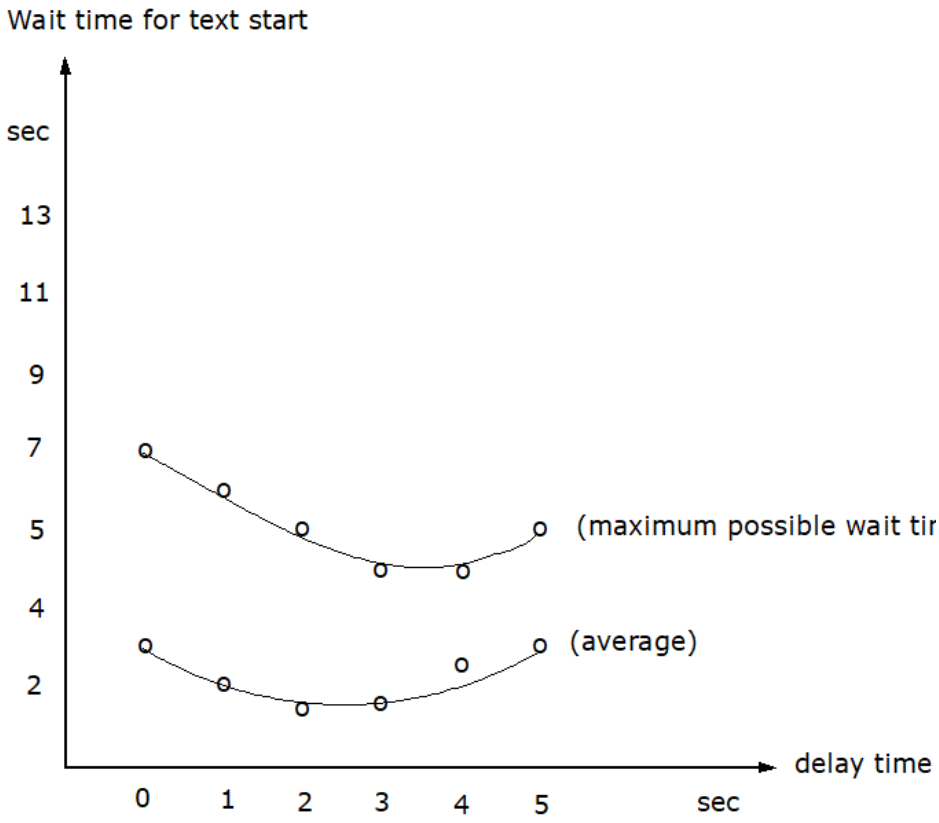
Example: Number of announcement units = 1

Comment: A synchronized announcement with start delay for only one announcement unit is unreasonable. With an increasing start delay, both the average wait time and the maximum wait time show near linear increase.



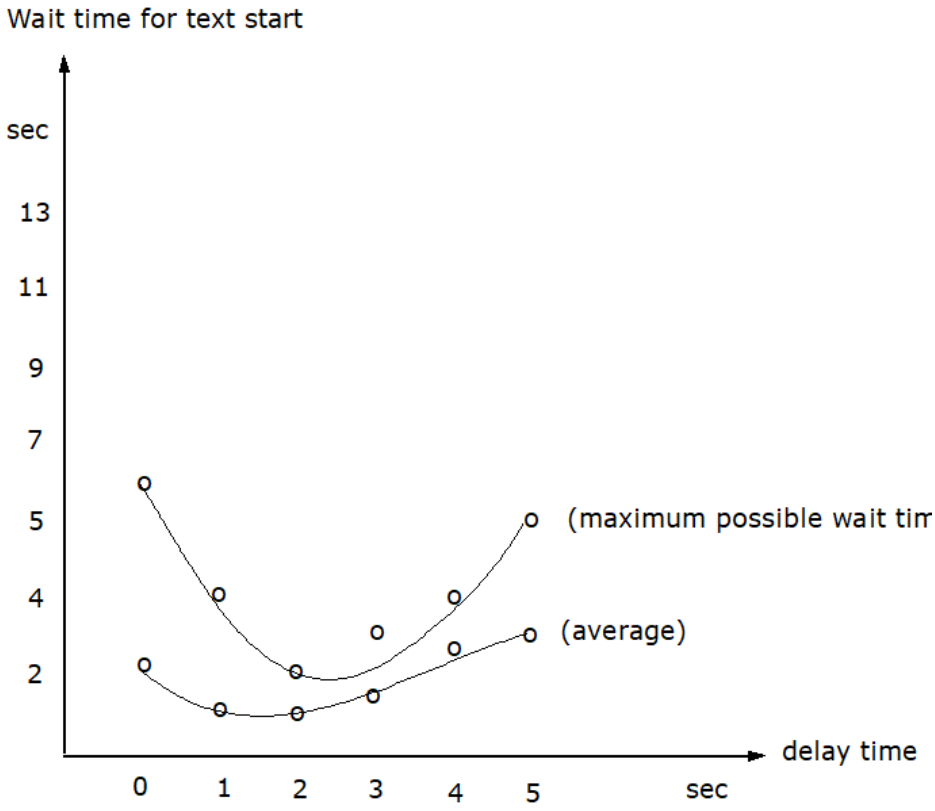
Example: Number of announcement units = 2

Comment: In this case the maximum possible delay time is constant at 8 seconds. The shortest wait time (2.7 seconds) is achieved with a start delay time of 2 seconds.



Example: Number of announcement units = 3

Comment: In this case the maximum possible wait time can obviously be influenced by the start delay time. With a start delay time of 2 seconds the average wait time for text start (1.5 seconds) reaches its minimum. The optimum is a start delay time of 3 seconds.



Example: Number of announcement units = 4

Comment: In this case the maximum possible wait time reaches its minimum of 2 seconds with a start delay time of 2 seconds. The average wait time reaches its minimum of 1.5 seconds also with a start delay time of 2 seconds.

Rule of thumb:

Calculation of the optimum timing for synchronized announcements, in order to achieve briefer wait times for text start using different text lengths, is facilitated by the following consideration.

The text length of the first active announcement unit must be covered by the result of the start delay time and the number of additional announcement units.

Ergo: Text length = start delay time multiplied by the number of announcement units.

Example:

- Text length: 40 sec
- Start delay time: 5 sec / 10 sec / 20 sec
- Number of announcement units: 8/4/2

In figures:	40 sec =	5 sec multiplied by 8	or
		10 sec multiplied by 4	or

		20 sec multiplied by 2	or ...

The number of necessary announcement units in relation to the set delay time results from the following formula:

Number of announcement units = text length/begin delay time + 1

In figures:	number of announcement units	= 40 sec /5 sec + 1 = 8 + 1 = 9	or
		= 40 sec /10 sec + 1 = 4 + 1 = 5	or
		= 40 sec /20 sec + 1 = 2 + 1 = 3	or ...

If this procedure is used

- the maximum possible wait time for text start is always equal to the set start delay time.
- the average wait time for text start is equal to half the maximum possible wait time.

Which value combination is used depends on how many announcement units should be used (matter of costs) to reduce the wait times for text start to which justifiable value.

The following tables show possible combinations for different text lengths and the resulting wait times for text start.

No. of announcement units	Start delay time	Max. possible wait time	Average wait time
1+1 = 2	40 sec	40 sec	20 sec
2+1 = 3	20 sec	20 sec	10 sec
4+1 = 5	10 sec	10 sec	5 sec
5+1 = 6	8 sec	8 sec	4 sec
8+1 = 9	5 sec	5 sec	2.5 sec
10+1 = 11	4 sec	4 sec	2 sec
20+1 = 21	2 sec	2 sec	1 sec

Example: Text length = 40 sec.

No. of announcement units	Start delay time	Max. possible wait time	Average wait time
1+1 = 2	30 sec	30 sec	15 sec
2+1 = 3	15 sec	15 sec	7.5 sec

No. of announcement units	Start delay time	Max. possible wait time	Average wait time
5+1 = 6	6 sec	6 sec	3 sec
6+1 = 7	5 sec	5 sec	2,5 sec
10+1 = 11	3 sec	3 sec	1.5 sec

Example: Text length = 30 sec.

No. of announcement units	Start delay time	Max. possible wait time	Average wait time
1+1 = 2	20 sec	20 sec	10 sec
2+1 = 3	10 sec	10 sec	5 sec
4+1 = 5	5 sec	5 sec	2,5 sec
5+1 = 6	4 sec	4 sec	2 sec
10+1 = 11	2 sec	2 sec	1 sec

Example: Text length = 20 sec.

No. of announcement units	Start delay time	Max. possible wait time	Average wait time
1+1 = 2	10 sec	10 sec	5 sec
2+1 = 3	5 sec	5 sec	2,5 sec
5+1 = 6	2 sec	2 sec	1 sec
10+1 = 11	1 sec	1 sec	0,5 sec

Example: Text length = 10 sec

Comment:

It is possible to allocated several announcement units to the same announcement type by assigning the same announcement type when configuring the TMOM announcement board (TSCSU).

A maximum of 64 announcement units can be configured in the PBX. They can be combined to any announcement types.

Extreme cases using 64 different announcement types with one announcement unit each or only 1 announcement type with 64 assigned announcement units are possible.

13.3.4 Possible Reasons why Announcements may not Work

13.3.4.1 General Requirements:

- Is the system feature "Synchronous Announcements" enabled (FEASU: SYNCANN)?
- Is the "Synchronous Announcements" feature activated in the central system data (ZAND: ALLDATA2, ANSES =Y)?
- Has the internal application for "No answer on AC", for "Call to CSM" and for "Call to hunting group call queue" been enabled using AMO ZAND?
- Is a sufficient number of announcement buffers assigned (DIMSU: SYNAN)?

  50 announcement buffers must be assigned per announcement unit (max. 64 announcement units).
- Have the necessary announcement types been defined, and assigned to the appropriate TMOM2 boards (TSCSU)
- Have the announcement types been activated, i.e. set to "ON" status? (SYNCA) - if ANSTATE parameter of AMO SYNCA is not specified during first configuration (ADD-SYNCA), then the default value is set: ANSTATE=OFF.
- Are you sure that the appropriate incoming direct exchange traffic or tie-traffic is being received?
- Are the TMOM2 connections compatible with the device type used?

  Genius ST and MUSIFONE 5000 S have different interfaces.
- If you are running the announcements in START/STOP mode, have you set the start delay timer value appropriately? (SYNCA)
- Have you defined an entry tone and a return tone for the appropriate announcement reasons? (SYNCA)
- Announcement reason/announcement type table (ANNMITR/ANNMCI)

  If the announcement type is to be used independently of an ITR value or the last dialed digit, the announcement type must be explicitly entered into the table for all ITR values and all last digits.
- Has the COT parameter ABPD (answering before suffix-dialing or announcement) for the digital exchange trunks been set?

  This COT parameter is mandatory for digital exchange lines, since the exchange will otherwise not receive the necessary criterion for switching through the call, i.e. the caller will not be able to hear the announcement.

  For analog exchange lines, this parameter is not checked. However, it must still be assigned if the exchange requires an answering criterion before switching through the connection.

  The same applies for incoming exchange traffic via transit lines, i.e. the COT parameter is not checked for the transit line. The parameter must be set if the calling exchange in the originating node requires an answering criterion before switching through the connection.

  If the parameter is set, call charge pulses are signaled immediately the announcement is started.

  Have the 2 timers WFIRST and WNEXT of the device handler of the TMOM2 been set to the appropriate values? (DTIM1)

  WFIRST defines the wait time for the first start of the announcement after connecting to the announcement unit. In START/STOP operation, this value can be kept small (1 - 4 sec.). If the announcement is run in CONTINUOUS mode, the value must be greater than the length of the announcement. If this

timer runs down, a line alarm is set for the TMOM board. In this case, you must check the JP interface cables.

WNEXT defines the wait time for the next start of the announcement following the first start. This value must always be set to a longer value than the announcement length. If timer runs down a line alarm is also set.

- If the diagnosis bit is set, call processing errors while attempting to access the announcement unit are output by means of advisory messages
- (DIAGS: CC, CP, S06=Y).
- If a fault occurs, the error message F4066 CP ADVISORY is output for diagnostic purposes.
- With remote parties: Has the COT parameter TNDV (tone injected from terminal) been set for the digital tie trunk (EV 3.0 and higher)?
- With internal parties (calling party is terminal): Has the COS (ANSYN) been set for the terminal (from EV3.0)?
- No synchronized announcement is injected after a call transfer (e.g. to CCM), although the transferring party heard the announcement before transfer.

  This can happened under the following circumstances:

  – The announcement type of the synchronized announcement is in START/STOP operating mode.
  – Only one announcement unit is assigned to this announcement type
  – The transferring terminal was the only device connected with the synchronized announcement.

  In this constellation the announcement unit is released during the transfer procedure and needs several seconds to become operable again. Therefore, for the transferred station there is no seizable announcement unit available at the time of transfer (from EV 3.0).

  Solution: Assign a second announcement unit to this announcement type.

  Set the operating mode of the announcement type to CONT.

13.3.4.2 Announcements for Attendant Call Queue

- Is the attendant group configured "with synchronous announcements"? (VFGR: ANSYN=Y)?
- Is the COT parameter WAAN set for the route concerned?
- Has the caller dialed the attendant direct or has the call been extended to the attendant via the attendant intercept feature?
- Is the announcement reason (WANNAOHK) entered in the ANNTONE branch in the AMO-SYNCA?

  For rerings, linked callback requests etc., no announcements will be heard.
- Has the start delay timer been set to an appropriate value? (CTIME: CP1, ATDLYANN)
- Have the correct entries been made in the announcement reason/announcement type tables for ANNMCI and ANNMITR? (SYNCA)

  – For direct dialing to the attendant group, the appropriate announcement types must be entered for the WANNAOHK announcement reason in the ANNMCI table for each possible last dialed digit.
  – For attendant intercept of incoming exchange calls on lines without direct inward dialing, the appropriate announcement types must be entered for

the WANNAOHK announcement reason in the ANNMITR table for the ITR number of the exchange line.

– For callers who reach the attendant group via FWD/FNANS/FBSY, the appropriate announcement types must be entered for the WANNAOHK announcement reason in the ANNMITR table for the ITR number of the forwarding station. However, this only works for forwarding stations in the same node as the announcement unit or in homogeneous OS4k networks, where the partner node can provide the ITR group information for the redirecting station. Otherwise, the ITR number of the connecting line applies.

- If the synchronized announcement is installed in the CAC node, have the COT parameters ABPD and WAAN been set for the tie trunk?
- Is the last digit in the attendant code entered for the ANNMCI branch in the AMO-SYNCA (satellite PBX AMO-NAVAR, CD-CASEXT)?
- If the synchronized announcement is installed in the CAC node and is only to be started, if the attendant console is in night service: has the COT parameter ABNA been set for the tie trunk?

  This parameter must not be set if you want the announcement to be enabled at the CAC even during the day.
- If the incoming trunk is an MSI trunk, has the COT parameter ABPD (answering before suffix-dialing or announcement) been set?
- If the incoming trunk is an MSI trunk without DDI and digit prefixing, has the appropriate announcement type been set using the administration in ANNMITR for the ITR of the MSI trunk?
- Has the internal application (calling party is terminal) been enabled for internal traffic using AMO ZAND (from EV 3.0)?

  AMO-ZAND BRANCH ATND, parameter ISYNCAC = YES
- Is the parameter ANSYN set in the internal terminal's COS?

13.3.4.3 Announcements for Calls to Multiple CCM

- Is the "Synchronous Announcements for CCM calls" feature activated in the central system data (ZAND: CCM, SYNCACCM=Y)?
- Has the COP parameter CCR been set for the route concerned?
- Is parallel ringing configured? (ZAND: CCM, STNRNG=NO)

  Parallel ringing is configured if the STNRNG parameter is set to Y, i.e. if the forwarding station and the CCM are rung in parallel. In this case, callers will hear the ringback tone.
- Is the announcement reason (ANNCCM) entered in the ANNTONE branch in the AMO-SYNCA?
- Is the CCM set to MEET ME operation? (TSCSU)
- Is the COT parameter CHRT set for the connecting line, i.e. can the call be transferred to the CCM?
- Have the correct entries been made in the announcement reason/ announcement type table, ANNMITR? (SYNCA)

  – For direct dialing to the CCM, the appropriate announcement types must be entered for the ANNCCM announcement reason in the ANNMITR table for the ITR number of the called party (for internal CCM users) or for the ITR number of the CCM (for external CCM users.

  - For callers who reach the code-calling system via FWD/FNANS/FBSY, the appropriate announcement types must be entered for the ANNCCM announcement reason in the ANNMITR table for the ITR number of the forwarding station. However, this only works for forwarding stations in the same node as the announcement unit or in homogeneous OS4k networks, where the partner node can provide the ITR group information for the redirecting station. Otherwise, the ITR number of the CCM applies.
- Has the internal application (calling party is terminal) been enabled for internal traffic using AMO ZAND (from EV 3.0)?

  AMO-ZAND BRANCH CCM, parameter ISYNCCCM = YES
- Is the parameter ANSYN set in the internal terminal's COS?

13.3.4.4 Announcements for Hunting Group Call Queue

- Is the call queue capacity of the hunt group large enough? (SA: CQMAX > 0)?
- Is the hunting group configured "with synchronized announcements"? (SA: CSANS=Y)?
- Are the COT parameters ANHT and BSHT set for the connecting lines?
- Is the announcement reason (WANNHG) entered in the ANNTONE branch in the AMO-SYNCA?
- Have the correct entries been made in the announcement reason/ announcement type table, ANNMITR? (SYNCA)
  - For direct dialing to the hunting group, the appropriate announcement types must be entered for the WANNHG announcement reason in the ANNMITR table for the ITR number of the first station in the hunting group.
  - For callers who reach the hunting group via FWD/FNANS/FBSY, the appropriate announcement type must be entered for the WANNHG announcement reason in the ANNMITR table for the ITR number of the forwarding station. However, this only works for forwarding stations in the same node as the announcement unit or in homogeneous OS4k networks, where the partner node can provide the ITR group information for the redirecting station.Otherwise, the ITR number of the first station in the hunting group applies.
- Has the internal application (calling party is terminal) been enabled for internal traffic using AMO ZAND (from EV 3.0)?

  AMO-ZAND BRANCH ALLDATA2, parameter ISYNCHG = YES
- Is the parameter ANSYN set in the internal terminal's COS?
- Is ZAND:ALLDATA HOLDHUNT set to "NO"? If it is "YES", then music on hold/please hold will be heard instead of the configured announcement.

13.3.4.5 General Announcements if Called Station is Busy

- Have the COT parameters ABNA&IBSY been set for the connecting line?
- Are you sure that the COT parameter KNDI has NOT been set for the connecting line?
- Is the announcement reason (ANNBUSY) entered in the ANNTONE branch in the AMO-SYNCA?

- Have the correct entries been made in the announcement reason/ announcement type table, ANNMITR? (SYNCA)
  - For direct lines:
    - For direct dialing to the a station user, the appropriate announcement types must be entered for the ANNBUSY announcement reason in the ANNMITR table for the ITR number of the called station user.
    - For callers who reach the station user via FWD/FNANS/FBSY, the appropriate announcement types must be entered for the ANNBUSY announcement reason in the ANNMITR table for the ITR number of the forwarding station. However, this only works for forwarding stations in the same node as the announcement unit or in homogeneous OS4k networks, where the partner node can provide the ITR group information for the redirecting station. Otherwise, the ITR number of the called, busy station user applies.
  - For transit lines:

    In this case, the connection is cleared back to the node with the exchange line interface (originating node).

    - Is the synchronized announcement configured in the originating node?
    - For direct dialing to the a station user, the appropriate announcement types must be entered for the ANNBUSY announcement reason in the ANNMITR table for the ITR number of the calling exchange line.
    - For callers who reach the station user via FWD/FNANS/FBSY, the appropriate announcement types must be entered for the ANNBUSY announcement reason in the ANNMITR table for the ITR number of the forwarding station. However, this only works for forwarding stations in the same node as the announcement unit or in homogeneous OS4k networks, where the partner node can provide the ITR group information for the redirecting station. Otherwise, the ITR number of the exchange line applies.

13.3.4.6 Announcement for Automatic Camp-on on Busy Station

Synchronized announcements are only possible for incoming digital trunks. Synchronized announcements are also possible for analog trunks, if the busy station is an Anate or Digite.

- Has the COT parameter ABNA been set for the connecting line?
- Are you sure that the COT parameter IFR is NOT set for the connecting line?
- Has the COT parameter KNDI been set for the connecting line?
- Does any other station camp-on this busy station?
- Has "Call forwarding when busy" not been activated for the busy station?
- Can the busy station be camped on?
- If the busy station is a functional terminal, has the COS parameter MULTRA not been set?
- Is the announcement reason (ANKNOCK) entered in the ANNTONE branch in the AMO-SYNCA?

- Have the correct entries been made in the announcement reason/ announcement type table, ANNMITR? (SYNCA)
  - For direct dialing to the busy station, the appropriate announcement type must be entered for the ANNBUSY announcement reason in the ANNMITR table for the ITR number of the busy station.
  - For direct dialing to the busy station via internal FWD/FBSY, the appropriate announcement type must be entered for the announcement reason ANCAMPON in the ANNMITR table for the ITR number of the forwarding party. However, this only works for forwarding stations in the same node as the announcement unit or in homogeneous OS4k networks, where the partner node can provide the ITR group information for the redirecting station. Otherwise, the ITR number of the called, busy station user applies.

13.3.4.7 General Announcements with call to station and no answer

- Has the COT parameter ABNA been set for the connecting line? (COT parameter IFR is optional)
- Are you sure that the COT parameter KNDI has NOT been set for the connecting line?
- Has the timer for "announcement with station no answer" been assigned an appropriate value? (CTIME: CP1, ANNDIAL)
- Is the announcement reason (ANNOHK) entered in the ANNTONE branch in the AMO-SYNCA?
- Have the correct entries been made in the announcement reason/ announcement type table, ANNMITR? (SYNCA)
  - For direct lines:
    - For direct dialing to the a station user, the appropriate announcement types must be entered for the ANNOHK announcement reason in the ANNMITR table for the ITR number of the called station user.
    - For callers who reach the station user via FWD/FNANS/FBSY, the appropriate announcement types must be entered for the ANNOHK announcement reason in the ANNMITR table for the ITR number of the forwarding station. However, this only works for forwarding stations in the same node as the announcement unit or in homogeneous OS4k networks, where the partner node can provide the ITR group information for the redirecting station. Otherwise, the ITR number of the called, busy station user applies.
  - For transit lines:

    In this case, the timer runs in the node with the exchange line interface (originating node).
    - Is the synchronized announcement configured in the originating node?
    - For direct dialing to the a station user, the appropriate announcement types must be entered for the ANNOHK announcement reason in the ANNMITR table for the ITR number of the calling exchange line.
    - For callers who reach the station user via FWD/FNANS, the appropriate announcement type must be entered for the ANNOHK announcement reason in the ANNMITR table for the ITR number of the forwarding station. However, this only works for forwarding stations in the same node as the announcement unit (e.g. originating node). Otherwise, the ITR number of the exchange line applies.

13.3.4.8 Announcements for Suffix Dialing if Called Station is Busy

- Is the feature "Suffix dialing if busy" enabled? (FEASU: POSTBUSY)
- Is the connecting line an analog exchange line?

  The function is currently only implemented for analog exchange lines.
- Is the COT parameter PDOB set for the connecting line?
- Are you sure that the COT parameter IFR is NOT set for the connecting line?
- Has the station user enabled automatic override?
- Is the announcement reason (SDBUSY) entered in the ANNTONE branch in the AMO-SYNCA?
- Have the correct entries been made in the announcement reason/ announcement type table, ANNMITR? (SYNCA)
  - For direct lines:
    - For direct dialing to the a station user, the appropriate announcement types must be entered for the SDBUSY announcement reason in the ANNMITR table for the ITR number of the called, busy station user.
    - For callers who reach the station user via FWD/FNANS/FBSY, the appropriate announcement types must be entered for the ANNBUSY announcement reason in the ANNMITR table for the ITR number of the forwarding station. However, this only works for forwarding stations in the same node as the announcement unit or in homogeneous OS4k networks, where the partner node can provide the ITR group information for the redirecting station. Otherwise, the ITR number of the called, busy station user applies.
  - For transit lines:

    In this case, the connection is cleared back to the node with the exchange line interface (originating node).
    - Is the synchronized announcement configured in the originating node?
    - For direct dialing to the a station user, the appropriate announcement types must be entered for the SDBUSY announcement reason in the ANNMITR table for the ITR number of the calling exchange line.
    - For callers who reach the station user via FWD/FNANS/FBSY, the appropriate announcement types must be entered for the ANNBUSY announcement reason in the ANNMITR table for the ITR number of the forwarding station. However, this only works for forwarding stations in the same node as the announcement unit or in homogeneous OS4k networks, where the partner node can provide the ITR group information for the redirecting station. Otherwise, the ITR number of the exchange line applies.

13.3.4.9 Announcements for Suffix Dialing if Station User does not Answer

- Is the feature "suffix dialing on no answer" enabled? (FEASU: POSTFREE)
- Is the connecting line an analog exchange line?

  The function is currently only implemented for analog exchange lines.
- Is the COT parameter PDOT set for the connecting line?
- Are you sure that the COT parameter IFR is NOT set for the connecting line?
- Is the announcement reason (SDOHK) entered in the ANNTONE branch in the AMO-SYNCA?

- Has the timer for "announcement with station no answer" been assigned an appropriate value? (CTIME: CP1, ANNDIAL)
  - For direct lines:
    - For direct dialing to the a station user, the appropriate announcement types must be entered for the SDOHK announcement reason in the ANNMITR table for the ITR number of the called, busy station user.
    - For callers who reach the station user via FWD/FNANS/FBSY, the appropriate announcement types must be entered for the ANNOHK announcement reason in the ANNMITR table for the ITR number of the forwarding station. However, this only works for forwarding stations in the same node as the announcement unit or in homogeneous OS4k networks, where the partner node can provide the ITR group information for the redirecting station. Otherwise, the ITR number of the called, busy station user applies.
  - For transit lines:

    In this case, the timer runs in the node with the exchange line interface (originating node).

    - Is the synchronized announcement configured in the originating node?
    - For direct dialing to the a station user, the appropriate announcement types must be entered for the SDOHK announcement reason in the ANNMITR table for the ITR number of the calling exchange line.
    - For callers who reach the station user via FWD/FNANS, the appropriate announcement type must be entered for the ANNOHK announcement reason in the ANNMITR table for the ITR number of the forwarding station. However, this only works for forwarding stations in the same node as the announcement unit (e.g. originating node). Otherwise, the ITR number of the exchange line applies.

13.3.4.10 Announcements for Direct Inward Dialing

- Is the connecting line an analog exchange line?
- Have the correct entries been made in the announcement reason/ announcement type table, ANNMITR?
- Is the announcement reason (DIDSD) entered in the ANNTONE branch in the AMO-SYNCA?

  The appropriate announcement types must be entered for the DIDSD announcement reason in the ANNMITR table for the ITR number of the exchange line.

13.3.4.11 Announcement for call to AC in night service

The same principles as for AC in day service apply. If, during night service, the same announcement is injected as during day service, the following must be checked in case the TMOM and the CAC are located in different nodes:

- Is this a homogeneous OpenScape 4000/HiPath 4000 network?

  It could possibly happen that the information stating that the CAC in the destination node is in night service may not transmitted in mixed networks.

- Is there a multiple-embedded CAC function in the destination node?

  In this case the possible night service of the CAC in the destination node is not recognized and therefore is not transmitted to the originating node.
- Was the CAC switched from day to night service after seizure?

  In this case, only the announcement for day service can be injected. The implemented concept does not provide an update of the day/night status of the CAC in the destination node.
- Have the correct entries been made in the announcement reason/ announcement type table, ANNMITR (WANNDNS, SYNCA)?
- Is the announcement reason (WANNDNS) entered in the ANNTONE branch in the AMO-SYNCA?
- Are you sure that the COT parameter ABNA has NOT been set for the connecting line?

14 MLPP (Multi-Level Precedence and Preemption)

14.1 Feature Description

The Multi-Level Precedence and Preemption (MLPP) service provides prioritized call handling service. This service has two parts - Precedence and Preemption.

The specific requirements for MLPP are described in the Generic Switching Center Requirements (GSCR) document (September 8, 2003). The GSCR specifies support for different types of switches. This document focuses on PBX1 and SMEO (**Sm**all **E**nterprise **O**ffice).

Precedence

Precedence involves assigning a priority level to a call.

Preemption

Preemption involves a higher precedence call seizing resources that are in use by a lower precedence call, in the absence of idle resources.

14.2 Specific terminology

Precedence is the priority associated with a call.

A precedence call is a call with precedence level higher than the lowest level of precedence.

MLPP Service Domain: An MLPP service domain consists of a set of MLPP subscribers (MLPP users) and the network and access resources that are in use by that set of MLPP subscribers at any given time. Connections and resources that are in use by MLPP subscribers may only be preempted by higher precedence calls from MLPP subscribers within the same domain. The Defense Switch Network (DSN) service domain is zero (0). Stations and trunks may have their own service domain and preemption can only occur in the same service domain.

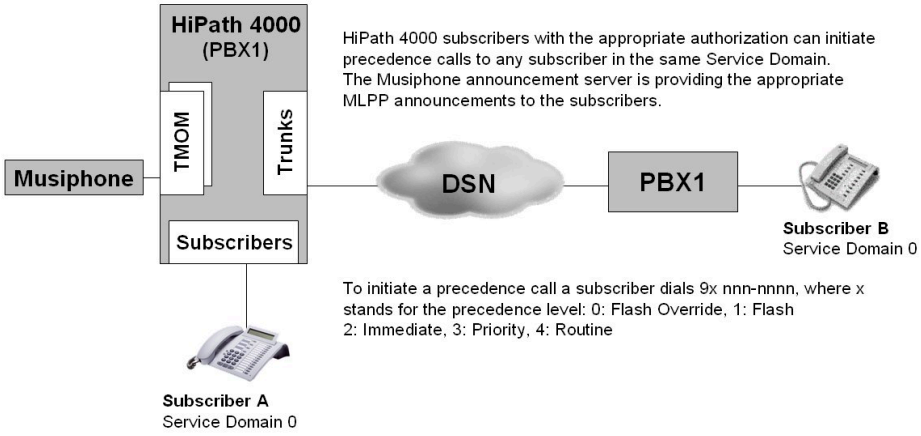
Network: In this standard, "network" refers to all telecommunications equipment that has any part in processing a call or a supplementary service for the user referred to. It may include local exchanges, transit exchanges, and NT2s but does not include the ISDN terminal and is not limited to the "public" network or any other particular set of equipment.

MLPP Call: An MLPP call is a call that has a precedence level established and is ether being setup or is setup. In Digital Subscriber Signaling System number 1 (DSS1: ISDN Q.931 signaling), an MLPP call is a call from an MLPP subscriber for which a setup has been sent but no DISCONNECT has been sent or received.

Preemptable Circuit: A preemptable circuit is a circuit that is active with or reserved for an MLPP call: (a) within the same domain as the preempting call and (b) with a lower precedence than the preempting call. A busy or reserved circuit for which a precedence level has not been specified is not a preemptable circuit.

Preemption initiating exchange: A preemption initiating exchange is the exchange that is congested (i.e. no idle circuits) and has received a preempting call setup.

14.3 Overview



See following sections for essential information on how to configure MLPP.

• Section 172.1, "Relevant AMOs"	page 1677
• Section 172.2, "Global switch configuration"	page 1684
• Section 172.3, "Announcements (via Musiphone)"	page 1688
• Section 172.4, "Assignment of the Information Tones"	page 1691
• Section 172.5, "Assignment of Ringing Tones"	page 1692
• Section 172.6, "Basic Trunk Administration"	page 1693
• Section 172.7, "Calls in Queue to the Attendant"	page 1701
• Section 172.8, "CDR Fields (SMEO)"	page 1703
• Section 172.9, "DSN Hotline Service (SMEO)"	page 1704
• Section 172.10, "Outgoing and tandem call trace (SMEO)"	page 1706
• Section 172.11, "Further Information"	page 1708

14.4 Administration

IMPORTANT: Functions which may not be activated for DSN switches in AMO ZAND are "protected calls" (PROT) and "automatic connection after preemption" (MAUTO).

IMPORTANT: The feature "Black/White list" is working in MLPP systems only!

14.4.1 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
BWLST	BWLIDX	d	Index für B/W Liste (Number 1-500)
	BWLIDX	e	Index for Destination Numbers List (Number 1-500)
	ERL	d	**ERL=JA** bedeutet, dass die Liste 'unlocked=white' Nummern enthält. **ERL=NEIN** bedeutet, dass die Liste 'locked=black' Nummern enthält. Default Wert: JA
	ALLWD	e	**ALLWD=YES** means 'unlocked=white' are included in the list. **ALLWD=NO** means 'locked=black' numbers are included in the list. Default value: YES
	ALLINCAL	d	**ALLINCAL=JA** bedeutet dass die Liste nur für kommende Anrufe gültig ist. **ALLINCAL=NEIN** bedeutet dass die Liste nur für kommende Hotline Anrufe gültig ist. Default Wert: JA
	ALLINCAL	e	**ALLINCAL=YES** means list is only valid for all incomming calls. **ALLINCAL=NO** means list is only valid for all incomming Hotline calls. Default value: YES
	ZIELNR	d	Zielnummern für Black White Liste EINRICHTEN: 1 bis 3 Einzelwerte, gekettet mit & oder &&, erforderlich, LOESCHEN: 1 bis 3 Einzelwerte, gekettet mit & oder &&, wahlfrei () Mögliche Werte: 0-9,*,#,A-D, max. 22-stellig

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	DESTNO	e	Destination Numbers for Black and White List (3 Numbers with Concat, 22 DIGIT Number). The wildcards "#" and "*" can be used. The digit "#" replaces exact one digit in the range of 0 ... 9. The digit "*" at the end of a pattern replaces one or more digits in the range of 0 ... 9. Wildcards are only allowed at the end of a pattern. A mix of "*" and "#" is not possible.
COP	COPPAR	d	Parameterwerte für eine Class of Parameter Wert RDIG: 1./2.Ziffer wird als MLPP RouteCodeDigit behandelt
	PAR	e	Parameter to be entered value RDIG: 1st/2nd Digit handled as a MLPP Route Code Digit
	COPPAR	d	Parameterwerte für eine Class of Parameter Wert PDIG: 1. Ziffer wird als MLPP Precedence Digit behandelt
	PAR	e	Parameter to be entered value PDIG: 1st Digit is handled as a MLPP Precedence Digit
	COPPAR	d	Parameterwerte für eine Class of Parameter Wert PRMT: Leitung mit Preemption Signalisierung
	PAR	e	Parameter to be entered value PRMT: Line with preemption signalling

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
COT	COTPAR	d	Wert FLASH: MLPP-Level Flash Wert FLASHOV: mlpp-level flash override (high level) Wert IMMED: MLPP-Level Immediate Wert PRTY: mlpp-level priority (low level) Wert DSNR: MLPP-Level Routine Wert VCE: trunk for voice Wert DTE: trunk for data
	PAR	e	Value FLASH: MLPP-Level Flash Value FLASHOV: mlpp-level flash override (high level) Value IMMED: MLPP-Level Immediate Value PRTY: mlpp-level priority (low level) Value DSNR: MLPP-Level Routine Value VCE: trunk for voice Value DTE: trunk for data
FTBL	ELNAM	d	Elementname PRECLEVL MLPP Precedence Level
	FLDNAME	e	PRECLEVL MLPP Precedence Level
	ELNAM	d	Elementname SVCDOM MLPP Service Domain
	FLDNAME	e	SVCDOM MLPP Service Domain
HOTLN	PRECLEVL	d	MLPP Precedence Level Wert FLASH: MLPP-Level Flash Wert FLASHOV: mlpp-level flash override (high level) Wert IMMED: MLPP-Level Immediate Wert KEINE: kein precedence level Wert PTINEP: static protection against mlpp-calls Wert PRTY: mlpp-level priority (low level) Wert RTINE: MLPP-Level Routine

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	PRECLEVL	e	MLPP Precedence Level Value FLASH: MLPP-Level Flash Value FLASHOV: mlpp-level flash override (high level) Value IMMED: MLPP-Level Immediate Value NONE: no precedence level Value RTINEP: static protection against mlpp-calls Value PRTY: mlpp-level priority (low level) Value RTINE: MLPP-Level Routine
LDAT	LATTR	d	MLPP Precedence Level Wert FLASH: MLPP-Level Flash Wert FLASHOV: mlpp-level flash override (high level) Wert IMMED: MLPP-Level Immediate Wert NOLEV: kein precedence level Wert RTINEP: static protection against mlpp-calls Wert PRTY: mlpp-level priority (low level) Wert RTINE: MLPP-Level Routine
	LATTR	e	MLPP Precedence Level Value FLASH: MLPP-Level Flash Value FLASHOV: mlpp-level flash override (high level) Value IMMED: MLPP-Level Immediate Value NONE: no precedence level Value RTINEP: static protection against mlpp-calls Value PRTY: mlpp-level priority (low level) Value RTINE: MLPP-Level Routine
RICHT	KPRCAUL	d	Keine Precedence Calls umlenken Wird dieser Schalter gesetzt, so wird eine Umlenkung von Precedence Calls blockiert. Wert JA: Feature aktivieren Wert NEIN: Feature deaktivieren

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	NOPRCFWD	e	No Precedence Call forwarding AD: If this switch is set, call forwarding for precedence calls will be locked. value YES: activate feature value NO: deactivate feature
SDAT	SVCDOM	d	MLPP Sevice Domain
	SVCDOM	e	MLPP Sevice Domain
	DELSVCDM	d	Löschen der MLPP Sevice Domain
	DELSVCDM	e	Delete MLPP Sevice Domain
	PRECLEVL	d	MLPP Precedence Level Wert FLASH: MLPP-Level Flash Wert FLASHOV: mlpp-level flash override (high level) WertIMMED: MLPP-Level Immediate Wert KEINE: kein precedence level Wert MLPPS: static protection against mlpp-calls Wert PROT: for dynamic outgoing call protection Wert PRTY: mlpp-level priority (low level) Wert ROUTINE: MLPP-Level Routine
	PRECLEVL	e	MLPP Precedence Level Value FLASH: MLPP-Level Flash Value FLASHOV: mlpp-level flash override (high level) Value IMMED: MLPP-Level Immediate Value KEINE: no precedence level Value MLPPS: static protection against mlpp-calls Value PROT: for dynamic outgoing call protection Value PRTY: mlpp-level priority (low level) Value ROUTINE: MLPP-Level Routine
	BWLIDX	d	Index for Destination Numbers List (Number 1-500)

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	BWLIDX	e	Index for Destination Numbers List (Number 1-500)
SYNCA	ANSGRUND	d	Ansagegrund Wert ABGEWPRC: Ansage bei abgewiesenem Precedence Call Wert NAUTHPRC: Ansage bei keiner Precedence Call - Berechtigung Wert TLNNPR: Ansage bei nicht vorhandenem Teilnehmer Wert TLNDEF: Ansage bei defektem Teilnehmer Wert RESMNGL: Ansage bei Resourcenmangel Wert TRENNERL: Ansage nicht trennbarem Teilnehmer Wert VP: Ansage des Vermittlungsplatz
	ANREASON	e	announcement reason Value BLOCKPR: Blocked Precedence Announcement Value UNAUTHPR: Unauthorized Precedence Announcement Value VACCODE: Vacant Code Announcement Value ISOLCODE: Isolated Code Announcement Value PRACCLIM: Precedence Access Limitation Announcement Value BUSYNEQU: Busy Not Equipped Announcement Value ATTDQUE: Attendant Queue Announcement
TACSU	SVCDOM	d	MLPP Service Domain
	SVCDOM	e	MLPP Sevice Domain
	DELSVCDM	d	Löschen der MLPP Sevice Domain
	DELSVCDM	e	Delete MLPP Sevice Domain
TDCSU	SVCDOM	d	MLPP Service Domain
	SVCDOM	e	MLPP Sevice Domain
	DELSVCDM	d	Löschen der MLPP Sevice Domain

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	DELSVCDM	e	Delete MLPP Sevice Domain
UCSU	KONVLAW	d	Dieser MLPP bezogene Parameter bestimmt, ob auf der NCUI-Baugruppe eine Konvertierung der Dämpfungsart (A-Law <-> Mu-Law) stattfinden soll.
	CONVLAW	e	This MLPP related parameter defines, if the type of attenuation should be converted (A-Law <-> Mu-Law) by means of the NCUI board
VFGR	MLPP1	d	MLPP Flash override
	MLPP1	e	MLPP Flash override
	MLPP2	d	MLPP Flash
	MLPP2	e	MLPP Flash
	MLPP3	d	MLPP Immediate
	MLPP3	e	MLPP Immediate
	MLPP4	d	MLPP Priority
	MLPP5	e	MLPP Priority
WABE	KZP	d	Kennzahlpunkt Wert DSNR: MLPP DSN-Routine
	DAR	e	digit analysis result Value DSNR: MLPP DSN Routine
ZAND	SIU	d	Auswahl der länderspezifischen SIU-Tontabelle Wert V: DSN - Kennlinie A-Law Wert W: DSN - Kennlinie U-Law
	SIUC	e	Selection of country-specific SIU tone table Value V: DSN - A-law coding Value W: DSN - U-law coding
	CPTON	d	Vermittlungstechnischer Ton
	CP	e	Call processing tone
ZANDE	TYP	d	Auswahl des Datentyps Wert MLPP: Multi-Level Precedence and Preemption Service

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	TYPE	e	Desired system option Value MLPP: Multi-Level Precedence and Preemption Service
	DOMALLOC	d	Einem Nicht-MLPP-Ruf wird eine Service Domain zugeordnet (eventuell wird die Funktion des COT:NMLT ausser Kraft gesetzt). Der Schalter wirkt nur in Verbindung mit dem gesetzten FEASU-Schalter MLPP. Ist dieser Schalter nicht gesetzt, bleiben Nicht-MLPP-Rufe ohne Service Domain. DB-Initialisierung: nein
	DOMALLOC	e	An individual service domain is assigned to a non-MLPP call (and may deactivate the function of COT:NMLT). This switch is only valid with the FEASU switch MLPP. If this switch is not set a non-MLPP call will stay without a service domain. DB-Initialization: no
	DOMCHECK	d	Trennen ist nur innerhalb der gleichen Service Domain erlaubt. Der Schalter wirkt nur in Verbindung mit dem gesetzten FEASU-Schalter MLPP. Ist dieser Schalter nicht gesetzt, kann unabhaengig von der Service Domain getrennt werden. DB-Initialisierung: nein
	DOMCHECK	e	Preemption is allowed only within the same service domain. This switch is only valid with the FEASU switch MLPP. If this switch is not set preemption is allowed independent of the service domain. DB-Initialization: no
	DSNHOTLN	d	DSN Hotline
	DSNHOTLN	e	DSN hotline
	MAROZVF	d	Bei gesetztem Schalter wird jedem MLPP Level am Vermittlungsplatz eine eigener Anrufordner zugeteilt. Ist dieser Schalter nicht gesetzt, wird die bisherige Funktionalitaet verwendet. DB-Initialisierung: nein
	MCIQTAC	e	If this switch is set every MLPP level gets its own queue at the Attendant Console. If this switch is not set the old functionality is provided. DB-Initialization: no

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	USMUAUL	d	Precedence Calls werden nach den MUF-Regeln umgeleitet. Ist dieser Schalter nicht gesetzt, wird die bisherige Funktionalitaet verwendet. DB-Initialisierung: nein
	USMUDIV	e	Precedence calls will be diverted on MUF rules. If this switch is not set the old functionality is provided DB-Initialization: no
	USMUXFER	d	Precedence Level werden nach den MUF - Regeln aktualisiert . Ist dieser Schalter nicht gesetzt, werden die Precedence Levels nach den MLPP-Regeln aktualisiert. DB-Initialisierung: nein
	USMUXFER	e	Precedence levels will be updated on MUF rules. If this switch is not set the precedence levels will be updated on MLPP rules. DB-Initialization: no
	UMLPREC	d	Precedence Calls werden weitergeleitet. Ist dieser Schalter nicht gesetzt, werden Precedence Calls nicht weitergeleitet. DB-Initialisierung: nein
	FWDPREC	e	Precedence calls will be forwarded. If this switch is not set precedence calls will not be forwarded. DB-Initialization: no
	ANKLPREC	d	Hoeherranginge kommende Precedence Calls in der gleichen Service Domain trennen alle existierenden Anrufe (auch wenn beim Anrufer Zweitanruf aktiviert ist). Ist dieser Schalter nicht gesetzt, werden Precedence Calls nicht weitergeleitet. DB-Initialisierung: nein
	CAMPPREC	e	Higher precedence incoming calls from the same service domain will preempt all existing calls (even if call waiting is activated at the called party). If this switch is not set all incoming calls will camp on to a busy called party regardless of the service domains and precedence levels. DB-Initialization: no

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
	PATONMAK	d	Wird zu einem getrennten und gehaltenen Gespraechspartner zurueckgemakelt, wird dies durch einen Ton signalisiert. Ist dieser Schalter nicht gesetzt, wird dieser Ton nicht erzeugt. DB-Initialisierung: nein
	PNTTGLE	e	A signalling tone is done when toggling back to a preemted held partner. If this switch is not set there will be no signalling tone. DB-Initialization: no
	MCAUSE	d	Die MUF-Regeln kommen zur Anwendung.Ist dieser Schalter nicht gesetzt, wird die bisherige Funktionalitaet verwendet. DB-Initialisierung: nein
	MCAUSE	e	MUF rules are applying.If this switch is not set the old functionality is provided. DB-Initialization: no
	CWTPRECT	d	Im Falle von Precedence Calls wird ein spezieller Anklopf-Ton verwendet. Ist dieser Schalter nicht gesetzt, wird die bisherige Funktionalitaet verwendet. DB-Initialisierung: nein
	CWTPRECT	e	In case of a precedence call a special call waiting tone is applied. If this switch is not set the old functionality is provided. DB-Initialization: no
	CONFDSCT	d	Im Falle von Precedence Calls wird ein spezieller Konferenz-Ende-Ton verwendet. Ist dieser Schalter nicht gesetzt, wird die bisherige Funktionalitaet verwendet. DB-Initialisierung: nein
	CONFDSCT	e	In case of a precedence call a special conference disconnect tone is applied. If this switch is not set the old functionality is provided. DB-Initialization: no
	GSCR	d	Trunk selection, Wert METHODE1 (default) - nicht SMEO Wert METHODE 2 - trunk selection METHODE 1
	GSCR	e	Trunk selection, Value METHODE 1 (default) - no SMEO Value METHODE 2 - trunk selection METHODE 1

14.4.2 Global switch configuration

This is the minimal configuration so that basic features (preemption, call forwarding, etc..) will work according to MLPP requirements. First of all you have to enable the feature MLPP:

```
CHANGE-FEASU:TYPE=A,CM=MLPP;

CHANGE-FEASU:TYPE=D,CM=EMOVR&EMRLS;
```

Assign the service domain for the switch. The first two digits are for network identification and the last three digits are for the service domain (0-0-0-0-0 is the default value unless otherwise specified by the customer).

```
CHANGE-ZAND:TYPE=MLPP,MAUTO=NO,MCAMP=NO,
MTONE=NO,MLPPDISP="P0P1P2P3P4",MLPPDOM=0-0-0-0-0;

MDIVAC=YES;
```

IMPORTANT: The **MDIVAC** has to be set for night station even if there is no attendant console!

```
CHANGE-ZANDE:TYPE=MLPP,DOMALLOC=NO,DOMCHECK=NO,
MCIQTAC=YES,USMUDIV=YES,USMUXFER=YES,FWDPREC=YES,
CAMPPREC=YES,PNTTGLE=YES,MCAUSE=YES,CWTPRECT=YES,
CONFDSCT=YES;
```

Assign the access codes for precedence levels.

```
ADD-WABE:CD=90,DAR=FLASHOV,CHECK=N;

ADD-WABE:CD=91,DAR=FLASH,CHECK=N;

ADD-WABE:CD=92,DAR=IMMED,CHECK=N;

ADD-WABE:CD=93,DAR=PRTY,CHECK=N;

ADD-WABE:CD=94,DAR=DSNR,CHECK=N;

ADD-WABE:CD=95,DAR=PROT,CHECK=N;
```

For each subscriber the highest allowed precedence level and the service domain has to be configured. The customer must specify the precedence level for each subscriber. **PRECLEVL** is the parameter used to set the allowed level. **SVCDOM** is the service domain, use 0-0-0-0-0 as default unless otherwise specified by the customer. The first two digits are for network identification and the last three digits are for the service domain.

```
CHANGE-SDAT:STNO=<station number>,
TYPE=DATA1,NNO=1-1-755,SVCDOM=0-0-0-0-0,
PRECLEVL=FLASHOV,CLASSSEC=TRADITIO;
```

Define the protocol elements by copying the protocol definition table.

```
COPY-PRODE:TYPE=PVCD,PVCDNO=16;
```

Prevent call forwarding of precedence calls to voice mail (if voice mail is installed)

```
CHANGE-RICHT:LRTE=<route to voice mail>,
NOPRCFWD=YES;
```

14.4.2.1 Global configuration for trunk searching (SMEO)

Activate SMEO feature for trunk searching:
`CHANGE-ZANDE:TYPE=MLPP,GSCR=METHODE2;`

METHODE1	- means in fact no SMEO trunk selection,
METHODE2	- means GSCR methode 1 for SMEO trunk selection

If METHODE1 is set (default) the old MLPP / MUF functionality will remain unchanged.

For each subscriber the highest allowed precedence level and the service domain have to be configured. The customer must specify the precedence level for each subscriber. PRECLEVL is the parameter used to set the allowed level. SVCDOM is the service domain, use 0-0-0-0-0 as default unless otherwise specified by the customer. The first two digits are for network identification and the last three digits are for the service domain.

```
CHANGE-SDAT:STNO=<stno>,TYPE=DATA1,
SVCDOM=0-0-0-0-0;

CHANGE-SDAT:STNO=<stno>,TYPE=DATA1,
PRECLEVL=FLASHOV; [V2.0 only]

CHANGE-SDAT:STNO=<stno>,TYPE=ATTRIBUT,
PRECLEVL=FLASHOV; [V1.0 only]
```

Activate MLPP/SMEO on trunks:

```
CHANGE-COT:COTNO=<cotnr>,COTTYPE=COTADD,
PAR=MLPR;

CHANGE-COT:COTNO=<cotnr>,COTTYPE=COTDEL,
PAR=PROV&EODL&NMLT;
```

If the trunk is dedicated for DATA service:

```
CHANGE-COT:COTNO=<cotno>,COTTYPE=COTADD,
PAR=DATA;

/* For VOICE trunks, no parameter is necessary */
```

Set the service domain for the trunks using the following commands. The first two digits are for network identification and the last three digits are for the service domain.

```
CHANGE-TDCSU:PEN=X,DEV=S2CONN,BCGR=1,
SVCDOM=0-0-0-0-0;
```

```
CHANGE-TACSU:PEN=X,DEVTYPE=TT,
SVCDOM=0-0-0-0-0;
```

LCR configuration must be carried out as follows (LDAT):

```
+-------------------------------------------------------------------------+
| LROUTE = 255   LDPLN        NAME = FP07 S2 7GR              SERVICE =  ALL |
| TYPE = LCR                                  DNNO OF ROUTE  =        802  |
| SERVICE INFO =                                                          |
+------+-----+-----+----+-----+----------+-----------+----------+------+-------+
|      |     |     |    |     | SCHEDULE | CARRIER   |          |      |       |
|LRTEL | LVAL|TGRP | ODR|LAUTH| ABCDEFGH |       ZONE|    LATTR | LDSRT|COTIDX |
+------+-----+-----+----+-----+----------+-----------+----------+------+-------+
|     1|    1|   51|   2| 1   | ******** | 1    EMPTY|   RTINEP |      | 0     |
+-------------------------------------------------------------------------+
|     2|    1|   52|   2| 1   | ******** | 1    EMPTY|    RTINE |      | 0     |
+-------------------------------------------------------------------------+
|     3|    1|   53|   2| 1   | ******** | 1    EMPTY|     PRTY |      | 0     |
+-------------------------------------------------------------------------+
|     4|    1|   54|   2| 1   | ******** | 1    EMPTY|    IMMED |      | 0     |
+-------------------------------------------------------------------------+
|     5|    1|   55|   2| 1   | ******** | 1    EMPTY|    FLASH |      | 0     |
+-------------------------------------------------------------------------+
|     6|    1|   56|   2| 1   | ******** | 1    EMPTY|  FLASHOV |      | 0     |
+-------------------------------------------------------------------------+
|     7|    1|   57|   2| 1   | ******** | 1    EMPTY|    NOLEV |      | 0     |
+-------------------------------------------------------------------------+
|     8|    1|   58|   2| 1   | ******** | 1    EMPTY|   ALTTGR |      | 0     |
+-------------------------------------------------------------------------+
```

This is the correct configuration for the customer requirements. The B-channel with the lowest priorities will be used first.

Please note that with any other configuration there is the risk that the desired result may not be obtained for the SMEO search routine!

Important notes about SMEO trunk searching:

1) The search routine is carried out for both voice and non-voice (data) trunk groups. The hunting sequence is capable of searching all trunks. For data calls, only data-grade trunks will be searched. For voice calls, all trunks will be searched.

2) The route selection is based on precedence level and service domain (SD) classmarks. If domain check is activated in the system (CHA-ZANDE:TYPE=MLPP,DOMCHECK=YES;) then a call with a certain SD can use only a trunk with the same SD.

3) The dimensioning of the LCR routes is very important. Note that for routine protected calls, only the corresponding classmarked trunks can be used. The trunk groups should be dimensioned according to the client traffic conditions. For example, if most of the calls are routine calls, the corresponding trunk group should contain the biggest part of the allocated B-channels. On the other hand, if just a small part of the calls are FLASHOV, there is no need to allocate too many B-channels for this level.

4) The above LCR configuration is mandatory in order to have the full SMEO capabilities. If the MLPP classmarked trunks are not in the specified order, problems can occur: there is the possibility that MLPP calls will use alternative routes before using the dedicated ones; or, what is more

dangerous, at the preemption point, a call with a higher priority (lower than the call being processed) will be disconnected instead of the one with the lowest priority.

14.4.2.2 Global configuration for DSN Hotline (SMEO)

Enable the HOTLINE feature:

```
CHANGE-FEASU:TYPE=A,CM=HOTRCL;

CHANGE-ZANDE:TYPE=ALLDATA2,DSNHOTLN=YES;
```

Originating Party

For the originating party basic HOTLINE classmarks must be set assigning it switchable to a COS of the station

```
CHANGE-COSSU:TYPE=COS,COS=<number>,
AVCE=HOT; (for VOICE)
```

or assigning it fix in AMO SDAT

```
CHANGE-SDAT:STNO=<number>,TYPE=ATTRIBUT,
AATTR=HOT;
```

Destination Party

For the destination party, the hotline classmark must be allowed:

```
CHANGE-COSSU:TYPE=COS,COS=<Number>,
AVCE=HOT;
```

For networking, the PDIG, RDIG and VRVB classmarks must be allowed:

```
ADD-COP:COPNO=<Number>,COPTYPE=COPADD,
PAR=PDIG&RDIG&PNIO;
```

The DSN Hotline Service can be split into four "subfeatures". The following table shows the differences between them:

Table 67: DSN Hotline subfeatures

Subfeature name	Outgoing side of hotline party	Incoming side of hotline party
PHC - Protected Hotline Calling	only hotline calls	only hotline calls from white parties
PPHC - Pair Protected Hotline Calling	only hotline calls	only hotline calls from party defined as outgoing target party
UHR - Unprotected Hotline Receiving	only hotline calls	no restriction

Subfeature name	Outgoing side of hotline party	Incoming side of hotline party
PHR - Protected Hotline Receiving	no restriction	only hotline calls from white parties

14.4.3 Announcements (via Musiphone)

IMPORTANT: For information on the configuration of the Musiphone, please refer to the Beyertone Musiphone Documentation. This document can be found on the Musiphone CD "The Next Level" that ships with the Musiphone device.

Administration of the announcements in OpenScape 4000:

1) Synchronized announcements, as a feature, has to be enabled on the system.

```
CHANGE-FEASU:TYPE=A,CM=SYNCANN;

CHANGE-ZAND:TYPE=ALLDATA2,ANSES=YES;
```

2) The different kinds of synchronized announcements have to be configured (AMO SYNCA). For each type of announcement a number has to be assigned, in the configuration below this assignment is as follows:

Announcement	Assigned number (ANSTYP)
BPA - Blocked Precedence Announcement	3
UPA - Unauthorized Precedence Announcement	4
VCA - Vacant Code Announcement	5
ICA - Isolated Code Announcement	6
BNEA - Busy Not Equipped Announcement	8
ATQA - Attendant Queue Announcement	9

This assigned number will be used when configuring the TMOM card for the announcement.

```
/* Blocked precedence announcement */
ADD-SYNCA:TABTYPE=ANNTT,ANNTYPE=3,ANNAME="MUF-BPA",
ANSTATE=ON,OPMODE=STASTO,DELAYTM=1;

ADD-SYNCA:TABTYPE=ANNMITR,ANREASON=BLOCKPR,
ITR=0&&15,ANNTYPE=3;

ADD-SYNCA:TABTYPE=ANNTONE,ANREASON=BLOCKPR,
PRETONE=LCRET,BACKTONE=LCRET;
```

```
/* Unauthorized precedence announcement */
ADD-SYNCA:TABTYPE=ANNTT,ANNTYPE=4,ANNAME="MUF-UPA",
ANSTATE=ON,OPMODE=STASTO,DELAYTM=1;

ADD-SYNCA:TABTYPE=ANNMITR,ANREASON=UNAUTHPR,
ITR=0&&15,ANNTYPE=4;

ADD-SYNCA:TABTYPE=ANNTONE,ANREASON=UNAUTHPR,
PRETONE=LCRET,BACKTONE=LCRET;

/* Vacant Code Announcement */
ADD-SYNCA:TABTYPE=ANNTT,ANNTYPE=5,ANNAME="MUF-VCA",
ANSTATE=ON,OPMODE=STASTO,DELAYTM=1;

ADD-SYNCA:TABTYPE=ANNMITR,ANREASON=VACCODE,
ITR=0&&15,ANNTYPE=5;

ADD-SYNCA:TABTYPE=ANNTONE,ANREASON=VACCODE,
PRETONE=LCRET,BACKTONE=LCRET;

/* Isolated Code Announcement */
ADD-SYNCA:TABTYPE=ANNTT,ANNTYPE=6,ANNAME="MUF-ICA",
ANSTATE=ON,OPMODE=STASTO,DELAYTM=1;

ADD-SYNCA:TABTYPE=ANNMITR,ANREASON=ISOLCODE,
ITR=0&&15,ANNTYPE=6;

ADD-SYNCA:TABTYPE=ANNTONE,ANREASON=ISOLCODE,
PRETONE=LCRET,BACKTONE=LCRET;

/* Busy Not Equipped Announcement */
ADD-SYNCA:TABTYPE=ANNTT,ANNTYPE=8,ANNAME="MUF-BNEA",
ANSTATE=ON,OPMODE=STASTO,DELAYTM=1;

ADD-SYNCA:TABTYPE=ANNMITR,ANREASON=BUSYNEQU,
ITR=0&&15,ANNTYPE=8;

ADD-SYNCA:TABTYPE=ANNTONE,ANREASON=BUSYNEQU,
PRETONE=LCRET,BACKTONE=LCRET;

/* Attendant Queue Announcement */
ADD-SYNCA:TABTYPE=ANNTT,ANNTYPE=9,ANNAME="MUF-ATQA",
ANSTATE=ON,OPMODE=STASTO,DELAYTM=1;

ADD-SYNCA:TABTYPE=ANNMITR,ANREASON=ATTDQUE,
ITR=0&&15,ANNTYPE=9;

ADD-SYNCA:TABTYPE=ANNTONE,ANREASON=ATTDQUE,
PRETONE=ANNICPT,BACKTONE=ANNICPT;
```

3) If AC-Win is not installed, skip this step. For attendant queue announcement the delay time before starting the announcement for the call in the queue is set to 1 second (AMO CTIME), and the announcement has to be enabled for the attendant queue (AMO VFGR).

```
CHANGE-CTIME:TYPESWU=CP1,ATDLYANN=1;
```

```
CHANGE-VFGR:ATNDGR=3,TYPE=GENERAL,ANSYN=YES;
/* Enable announcements for VFGRU=3 */

CHANGE-ZAND:TYPE=ATND,ISYNCAC=YES;
```

4) TMOM cards have to be configured for each announcement. For the TMOM cards a new COT (1) and a new COP (6) have been introduced.

```
ADD-COT:COTNO=1,PAR=LWNC&NLCR&ABPD&DFNN&NLRD&NTON;

ADD-COP:COPNO=6,PAR=SACK&LSUP,TOLL=TA,TRK=TA;
```

Each TMOM port provides sound for one type of announcement. In AMO TSCSU the type of the announcement (ANSTYP) is to be specified.

```
/* 1-2-103-0 provides BPA (ANSTYP=3) */

ADD-TSCSU:PEN=1-2-103-0,COTNO=1,DPLN=0,ITR=0,
CCT="",ALARMNO=0,SRCGRP=1,INS=Y,DEV=RAS,
COPNO=6,SUPV=SUPV5,ACKT=SZACK2,ANNTYPE=3;

/* 1-2-103-1 provides UPA (ANSTYP=4) */
ADD-TSCSU:PEN=1-2-103-0,COTNO=1,DPLN=0,ITR=0,
CCT="",ALARMNO=0,SRCGRP=1,INS=Y,DEV=RAS,
COPNO=6,SUPV=SUPV5,ACKT=SZACK2,ANNTYPE=4;

/* 1-2-103-2 provides VCA (ANSTYP=5) */
ADD-TSCSU:PEN=1-2-103-0,COTNO=1,DPLN=0,ITR=0,
CCT="",ALARMNO=0,SRCGRP=1,INS=Y,DEV=RAS,
COPNO=6,SUPV=SUPV5,ACKT=SZACK2,ANNTYPE=5;

/* 1-2-103-3 provides ICA (ANSTYP=6) */
ADD-TSCSU:PEN=1-2-103-0,COTNO=1,DPLN=0,ITR=0,
CCT="",ALARMNO=0,SRCGRP=1,INS=Y,DEV=RAS,
COPNO=6,SUPV=SUPV5,ACKT=SZACK2,ANNTYPE=6;

/* 1-2-55-0 provides BNEA (ANSTYP=8) */
ADD-TSCSU:PEN=1-2-103-0,COTNO=1,DPLN=0,ITR=0,
CCT="",ALARMNO=0,SRCGRP=1,INS=Y,DEV=RAS,
COPNO=6,SUPV=SUPV5,ACKT=SZACK2,ANNTYPE=8;

/* 1-2-55-1 provides ATQA (ANSTYP=9) */
ADD-TSCSU:PEN=1-2-103-0,COTNO=1,DPLN=0,ITR=0,
CCT="",ALARMNO=0,SRCGRP=1,INS=Y,DEV=RAS,COPNO=6,
SUPV=SUPV5,ACKT=SZACK2,ANNTYPE=9;
```

More TMOM ports can be configured for the different announcements the same way.

5) Announcements have to be enabled for subscribers (AMO COS):

- /* optiPoint/OpenStage COS=23*/

  ```
  CHANGE-COSSU:TYPE=COS,COS=23,AVCE=ANSYN;
  ```

- /* Anate COS=2*/

  ```
  CHANGE-COSSU:TYPE=COS,COS=2,AVCE=ANSYN;
  ```

- /* Profiset COS=24*/

```
CHANGE-COSSU:TYPE=COS,COS=24,AVCE=ANSYN;
```

- Announcements have to be enabled for trunks (AMO COT):

```
CHANGE-COT:COTNO=220,COTTYPE=COTADD,
PAR=ABPD&WAAN;
/* Analog trunk COT=220*/

CHANGE-COT:COTNO=221,COTTYPE=COTADD,
PAR=ABPD&WAAN;
/* Digital trunk COT=221*/
```

14.4.4 Assignment of the Information Tones

Select the country-specific SIU tone table for DSN:

```
CHANGE-ZAND:TYPE=TN,SIUC=V;
DSN tone table for a-law

CHANGE-ZAND:TYPE=TN,SIUC=W;
DSN tone table for u-law

ACT-USSU:UNIT=SIU;
```

In order to receive the US camp-on beeps the following ZAND parameter must be set

```
CHANGE-ZAND:TYPE=ALLDATA2,CAMPON=YES;
```

Activate DSN Precedence Call Waiting Tone:

```
CHANGE-ZANDE:TYPE=MLPP,CWTPRECT=YES;
```

Activate DSN Conference Disconnect Tone:

```
CHANGE-ZANDE:TYPE=MLPP,CONFDSCT=YES;
```

IMPORTANT: DSN call waiting tone for routine calls is 750ms single burst, only once. DSN call waiting tone for precedence calls is a 100ms double burst every 9.7 seconds.

14.4.5 Assignment of Ringing Tones

Assign DSN ringing for analog subscribers

```
CHANGE-PTIME:TYPE=SLMA,RNGON0=2000,RNGOFF0=4000,
RNGON61=1640,RNGOFF61=360,RNGON62=1640,
RNGOFF62=360,RNGON63=1640,RNGOFF63=360;
```

Assign DSN ringing for digital subscribers

```
CHANGE-ZAND:TYPE=RNGTYPE,NORM=DSNR;
[V2.0 only]
```

Assign DSN ringing for ulaw switch

```
CHANGE-ZAND:TYPE=ALLDATA2,USRINGTY=K;

CHANGE-ZAND:TYPE=ALLDATA,CNTRYCD=K;
```

Assign DSN ringing for alaw switch

```
CHANGE-ZAND:TYPE=ALLDATA2,USRINGTY=0;

CHANGE-ZAND:TYPE=ALLDATA,CNTRYCD=0;
```

14.4.6 Basic Trunk Administration

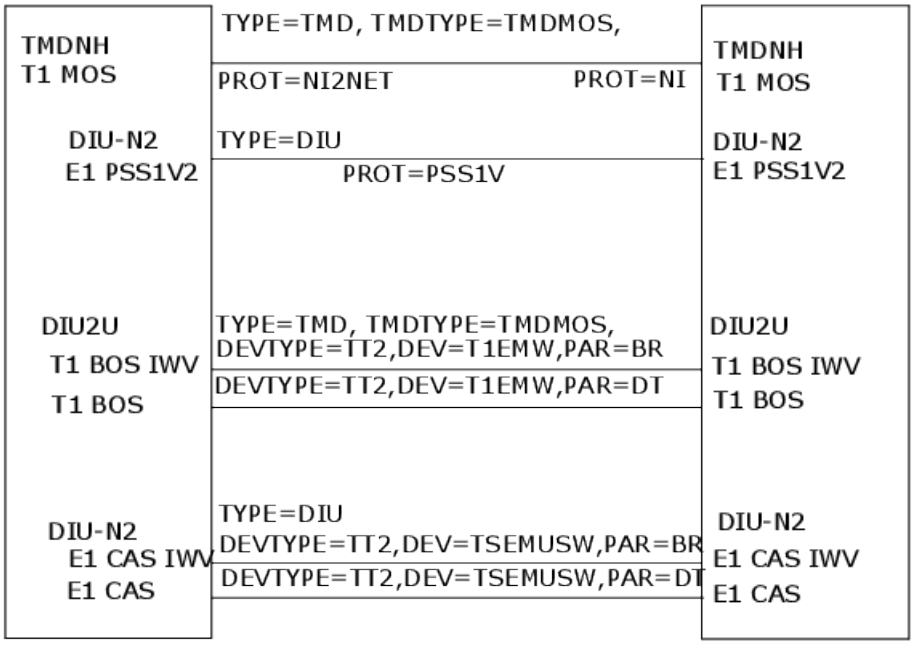


Figure 128: DSN Network

IMPORTANT: For DIU2U Trunk Administration the same parameters are to be used as for TMDNH.

14.4.6.1 General Administration of T1 MOS (example)

14.4.6.1.1 DIU2U for T1 MOS NI-2 Trunk

If the DIU2U sometimes fails to activate or LW exceptions occur, repeat these commands.

```
ADD-DIMSU:TYPE=BASIC,PRI=100,TRK=200;

EXEC-USSU:MODE=UPDATAP;
```

The existing trunk configuration must be deleted before configuring the trunk for MLPP

```
DEACTIVATE-DSSU:OFFTYPE=DI,TYPE=PEN,
PEN1=1-2-85-1;

DEACTIVATE-DSSU:OFFTYPE=DI,TYPE=PEN,
PEN1=1-2-85-0;

DELETE-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,
LDPNO=5&6;

DELETE-LDAT:KIND=LROUTE,LROUTE=103;

DELETE-LDAT:KIND=LROUTE,LROUTE=18;

DELETE-RICHT:MODE=CD,CD=003,CPS=0,SVC=ALL,
TYPE=ALL;

DELETE-RICHT:MODE=LRTE,LRTE=103;

DELETE-RICHT:MODE=LRTE,LRTE=18;

DELETE-TDCSU:PEN=1-2-85-0;

DELETE-TDCSU:PEN=1-2-85-1;

DELETE-BUEND:TGRP=81&74;

/*DELETE-BCSU:MTYPE=TMD,LTG=1,LTU=2,
SLOT=85;

DELETE-BCSU:MTYPE=DIU,LTG=1,LTU=2,
SLOT=85;
```

NEW DIU2U Administration

```
ADD-BCSU:MTYPE=TMD,LTG=1,LTU=2,SLOT=85,PARTNO=Q2216-X,
FCTID=6,LWVAR=K,HWYBDL=A;

/*AE-FUNSU:FLASH,Q2216-X,6,RESET;

CHANGE-FUNSU:PIT=FLASH,PARTNO=Q2216-X,FCTID=6,
ACTION=LOAD;

DELETE-LWPAR:TYPE=TMD,TMDTYPE=TMDMOS;

CHANGE-LWPAR:TYPE=TMD,TMDTYPE=TMDMOS,BLNO=1,
OPMODE=FRAMEESF&BISUB8ON&BDETON&NETUSER;

CHANGE-LWPAR:TYPE=TMD,TMDTYPE=TMDMOS,BLNO=2,
OPMODE=FRAMEESF&BISUB8ON&BDETON;

CHANGE-LWPAR:TYPE=TMD,TMDTYPE=TMDMOS,BLNO=3,
OPMODE=FRAMEESF&BISUB8ON&BDETON&NETUSER,CABLETYP=1,
OESDISTH=30,OESREQTH=4,SESDISTH=10,SESREQTH=10,
```

```
ACKTIM=10,DLVTIM=300,OCTMAX=260,RETMAX=3,WINDOW=7,
CRIDC=0288,NSFIV=1,NSFTSC=9,TTSC=4;

CHANGE-LWPAR:TYPE=TMD,TMDTYPE=TMDMOS,BLNO=4,
OPMODE=FRAMEESF&BISUB8ON&BDETON,OESDISTH=30,
OESREQTH=4,SESDISTH=10,SESREQTH=10,ACKTIM=10,
DLVTIM=300,OCTMAX=2 60,RETMAX=3,WINDOW=7,
CRIDC=0288,NSFIV=1,NSFTSC=9,TTSC=4;

CHANGE-PRODE:KIND=VARTAB,PROTVAR=NI2NET,
PDNORM=PD13,PDA1=PD02;

COPY-COT:TYPE=COT,COTOLD=120,COTNEW=100;

CHANGE-COT:COTNO=100,COTTYPE=COTDEL,PAR=ROPT;

ADD-BUEND:TGRP=74,NAME=AMT-DIU-2U,NO=60;

ADD-TDCSU:OPT=NEW,PEN=1-2-85-0,COTNO=100,COPNO=0,
DPLN=1,ITR=0,LCOSV=1,LCOSD=1,CCT="AMT A5 OFFEN",
DESTNO=3,PROTVAR=NI2NET,SEGMENT=1,DEDSVC=NONE,
TRTBL=GDTR,SIDANI=N,ATNTYP=CO,CBMATTR=NONE,
TCHARG=N,SUPPRESS=0,ISDNIP=00,ISDNNP=0,TRACOUNT=31,
SATCOUNT=MANY,NNO=1-1-300,ALARMNO=2,FIDX=1,CARRIER=1,
ZONE=INC01,COTX=100,FWDX=1,CHIMAP=N,UUSCCX=16,UUSCCY=8,
FNIDX=1,NWMUXTIM=10,CLASSMRK=EC&G711&G729OPT,TGRP=74,
SRCHMODE=DSC,INS=Y,DEV=S1COD,BCHAN=1&&23,BCNEG=N,BCGR=1,
IGN=0,IID=3,LWPAR=1;

ADD-RICHT:MODE=LRTENEW,LRTE=18,LSVC=ALL,NAME="LCR-OFFEN A5"
,TGRP=74,DNNO=1-1-300,REROUT=NO,ROUTATT=NO,EMCYRTT=NO,
PDNNO=1-2-300,CHARCON=NEUTRAL,CONFTONE=NO,RERINGRP=NO,
NOPRCFWD=NO;

ADD-LDAT:LROUTE=18,LSVC=ALL,LVAL=1,TGRP=74,ODR=2,
LAUTH=1,CARRIER=1,ZONE=TIE01,LATTR=WCHREG,VCCYC=4;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP="18"-"X",
LROUTE=18,LAUTH=1,PINDP=N;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP="18"-"T",
LROUTE=18,LAUTH=1,PINDP=N;

CHANGE-COP:COPNO=0,COPTYPE=COPADD,PAR=L3AR&ASNM&RMSG;

CHANGE-TDCSU:PEN=1-2-85-0,DESTNO=3,NNO=1-1-300,
DEV=S1COD,BCNEG=Y,BCGR=1,LWPAR=1;

CHANGE-REFTA:TYPE=CIRCUIT,PEN=1-2-85-0,PRI=88;

RESTART-BSSU:ADDRTYPE=PEN,LTG=1,LTU=2,SLOT=85;

DEACTIVATE-DSSU:OFFTYPE=DI,TYPE=PEN,PEN1=1-2-85-0;

ACTIVATE-DSSU:ONTYPE=AUL,TYPE=PEN,PEN1=1-2-85-0;
```

```
RESTART-DSSU:TYPE=PEN,PEN1=1-2-85-0;

DISPLAY-SDSU:STATUS=ALL,TYPE=PEN,LEVEL=PER2,
LTG=1,LTU=2,SLOT=85;

DISPLAY-PETRA:TYPE=DUMP,LTG=1,LTU=2,SLOT=85,
CPU=86,SEG=FFFF,ADR=FFFC;
```

14.4.6.1.2 TMDNH for T1 MOS NI-2 Trunk

Follow the instructions for the DIU2U in Section 172.6.1.1, "DIU2U for T1 MOS NI-2 Trunk", on page 1693 except as noted below.

```
CHANGE-LWPAR:TYPE=TMD,TMDTYPE=TMDMOS,BLNO=1,
OPMODE=FRAMEESF&BISUB8ON&BDETON&NETUSER,
CABLETYP=1,OESDISTH=30,OESREQTH=4,SESDISTH=10,
SESREQTH=10,ACKTIM=10,DLVTIM=300,OCTMAX=260,
RETMAX=3,WINDOW=7;

ADD-BCSU:MTYPE=TMD,LTG=1,LTU=2,SLOT=79,
PARTNO="Q2192-X",FCTID=2,LWVAR="K",HWYBDL=A;

ADD-TDCSU:OPT=NEW,PEN=1-2-79-0,COTNO=100,
COPNO=0,DPLN=0,ITR=0,PROTVAR=NI2,SEGMENT=1,
ATNTYP=ISDN,SATCOUNT=MANY,ALARMNO=2,FIDX=1,
COTX=120,FWDX=1,FNIDX=1,CLASSMRK=EC&G711&G729OPT,
TGRP=80,INS=Y,DEV=S1COD,BCHAN=1&&23,BCNEG=N,
BCGR=1,IGN=2,IID=14,LWPAR=2;
```

14.4.6.2 General Administration of T1 BOS (example)

14.4.6.2.1 TMDNH for T1 BOS EMW TIE

1)

```
CHANGE-LWPAR:TYPE=TMD,TMDTYPE=TMDBOS,BLNO=1,
OPMODE=FRAMEESF&BISUB8ON&BDETON&NETUSER,
CABLETYP=1,OESDISTH=30,OESREQTH=4,SESDISTH=10,
SESREQTH=10;

ADD-BCSU:MTYPE=TMD,LTG=1,LTU=2,SLOT=49,
PARTNO="Q2192-X",FCTID=1,LWVAR="K",LWPAR=1,
FIDX=1,HWYBDL=A;

ADD-COSSU:NEWCOS=220,AVCE=TA&TNOTCR&CDRC;
```

The following section is for EMW protocol (with pulse dialing trunk group 242 **Dial-Number 542 for TIE (IWV- Pulse Rotary EMW protocol) as an example).**

```
ADD-WABE:CD=542,DAR=TIE;

ADD-BUEND:TGRP=242,NAME="T1EMWIWV",NO=2;
```

COT and COP for Wink-DIAL IWV

```
ADD-COP:COPNO=242,PAR=ANS&RLSA&BR64&TIM1&
IDP1&SDL&SFRM&NAAT,INFO="QS-EMW-IWV";

ADD-COT:COTNO=242,PAR=RCL&NTON&ANS&NAAT&CEBC,
INFO=QS-EMW-IWV;
```

```
ADD-TACSU:PEN=1-2-49-1,COTNO=242,COPNO=242,
COS=220,LCOSV=1,LCOSD=1,TGRP=242,CCT="QSGUS-IM",
INS=Y,DEVTYPE=TT,DEV=T1EMW;

ADD-TACSU:PEN=1-2-49-2,COTNO=242,COPNO=242,
COS=220,LCOSV=1,LCOSD=1,TGRP=242,CCT="QSGUS-IM",
INS=Y,DEVTYPE=TT,DEV=T1EMW;

ADD-RICHT:MODE=LRTENEW,LRTE=242,LSVC=VCE,
NAME="T1EMW",TGRP=242,DNNO=1-1-501,ROUTATT=NO,
INFO="T1EMW",PDNNO=0;

ADD-LDAT:LROUTE=242,LSVC=VCE,LVAL=1,TGRP=242,
ODR=2,LAUTH=1;ADD-LDPLN:LCRCONF=LCRPATT,
DIPLNUM=0,LDP=542-X,LROUTE=242,LAUTH=1;
```

The following section is for EMW protocol with DTMF dialing trunk group 243

```
ADD-WABE:CD=543,DAR=TIE;

ADD-BUEND:TGRP=243,NAME="T1EMWMFV",NO=2;

ADD-COP:COPNO=243,PAR=ANS&RLSA&DTMF&DTM1&
TIM1&SDL&SFRM&NAAT&PDP1,TRK=TA,TOLL=TA,
DEV=INDEP,INFO=QS-WINK-MFV;

ADD-COT:COTNO=243,PAR=RCL&NTON&ANS&
NAAT&CEBC,INFO=QS-WINK-MFV;

ADD-TACSU:PEN=1-2-49-5,COTNO=243,COPNO=243,
COS=220,LCOSV=1,LCOSD=1,TGRP=243,CCT="QSGUS-IM",
INS=Y,DEVTYPE=TT,DEV=T1EMW;

ADD-TACSU:PEN=1-2-49-6,COTNO=243,COPNO=243,
COS=220,LCOSV=1,LCOSD=1,TGRP=243,CCT="QSGUS-IM",
INS=Y,DEVTYPE=TT,DEV=T1EMW;

ADD-RICHT:MODE=LRTENEW,LRTE=243,LSVC=VCE,
NAME="T1EMW",TGRP=243,DNNO=1-1-501,ROUTATT=NO,
INFO="T1EMIMFV",PDNNO=0;

ADD-LDAT:LROUTE=243,LSVC=VCE,LVAL=1,TGRP=243,
ODR=2,LAUTH=1;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=543-X,
LROUTE=243,LAUTH=1;
```

14.4.6.3 General administration for E1 CAS (example)

Set up DIU N2 (as CAS) for MLPP

```
ADD-BCSU:MTYPE=DIU,LTG=1,LTU=2,SLOT=109,
PARTNO="Q2196-X",LWVAR="0",LWPAR1=1,FIDX1=1,
LWPAR2=1,FIDX2=1,FCTID=2,HWYBDL=A;
```

Codes: 546-IWV, 547-MFV, 548-IWV, 549-MFV

```
ADD-WABE:CD=546&&549,DAR=TIE;

ADD-REFTA:TYPE=CIRCUIT,PEN=1-2-109-0,PRI=0;
```

Dial-Number 546 for TIE (DialPuls-Prot E&M Wink) This part is for EMW protocol with pulse dialing trunk group 246

```
ADD-BUEND:TGRP=246,NAME="E1-EMW-IWV",NO=4;

ADD-COP:COPNO=246,PAR=SDL&ANS&SFRM&RLSA&
BR64&NAAT&TIM1&IDP1,INFO=E&M-WINK IWV;

ADD-COT:COTNO=246,PAR=RCL&ANS&CEBC&MLPR&
NTON,INFO=E&M-WINK:IWV;

note: COT parameter NAAT must not be configured

ADD-TACSU:PEN=1-2-109-1,COTNO=246,COPNO=246,
COS=220,LCOSV=1,LCOSD=1,TGRP=246,CCT="E1-IWV",
INS=Y,DEVTYPE=TT,DEV=TSEMUSW;

ADD-TACSU:PEN=1-2-109-2,COTNO=246,COPNO=246,
COS=220,LCOSV=1,LCOSD=1,TGRP=246,CCT="E1-IWV",
INS=Y,DEVTYPE=TT,DEV=TSEMUSW;

ADD-RICHT:MODE=LRTENEW,LRTE=246,LSVC=VCE,
NAME="E1EM IW",TGRP=246,DNNO=1-1-501,ROUTATT=NO,
INFO="E1EM-IWV",PDNNO=0;

ADD-LDAT:LROUTE=246,LSVC=VCE,LVAL=1,TGRP=246,
ODR=2,LAUTH=1;

ADD-LDPLN:LDP=546-X,LROUTE=246,LAUTH=1;
```

Dial-Number 547 for TIE (DTMF-Prot E&M Wink) This part is for EMW protocol with DTMF dialing trunk group 247

```
ADD-BUEND:TGRP=247,NAME="E1-EMW-MFV",NO=4;

ADD-COP:COPNO=247,PAR=SDL&ANS&SFRM&RLSA&DTMF&
DTM1&NAAT,INFO=E&M-WINK MFV;

CHANGE-COP:COPNO=247,COPTYPE=COPADD,PAR=PDIG&
RDIG&PRMT;

ADD-COT:COTNO=247,PAR=RCL&NTON&ANS&CEBC,
INFO=E&M-WINK:MFV;

note: COT parameter NAAT must not be configured

ADD-TACSU:PEN=1-2-109-3,COTNO=247,COPNO=247,
COS=220,LCOSV=1,LCOSD=1,TGRP=247,COFIDX=2,
CCT="E1-MFV",INS=Y,DEVTYPE=TT,DEV=TSEMUSW;

ADD-TACSU:PEN=1-2-109-4,COTNO=247,COPNO=247,
```

```
COS=220,LCOSV=1,LCOSD=1,TGRP=247,COFIDX=2,
CCT="E1-MFV",INS=Y,DEVTYPE=TT,DEV=TSEMUSW;

ADD-RICHT:MODE=LRTENEW,LRTE=247,LSVC=VCE,
NAME="E1EM MF",TGRP=247,DNNO=1-1-501,ROUTATT=NO,
INFO="E1EM-MFV",PDNNO=0;

ADD-LDAT:LROUTE=247,LSVC=VCE,LVAL=1,TGRP=247,
ODR=2,LAUTH=1;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=547-X,
LROUTE=247,LAUTH=1;
```

14.4.6.4 Outpulsing Format

In order to meet the MLPP out-pulsing requirement the following flags have to be set in COP:

- PDIG (transport and analyzing of P-Digit)
- RDIG (transport and analyzing of R-Digit)

Example:

```
CHANGE-COP:COPNO=246,COPTYPE=COPADD,
PAR=PDIG&RDIG&PRMT;
```

14.4.6.5 Trunk Supervisory Preemption with E&M Wink

The E1 CAS must be configured before executing this step. The feature must be activated using COP: PRMT and COT: MLPR.

Example for Enhancement for MLPP Level and Preemption - new COP

```
CHANGE-COP:COPNO=246,COPTYPE=COPADD,
PAR=PDIG&RDIG&PRMT;

CHANGE-COT:COTNO=246,COTTYPE=COTADD,
PAR=MLPR;

For T1 CAS - PRMT parameter must not be activated.
```

14.4.6.6 Emergency Service

To prevent conflicts between 911 (emergency service) and 91-11-(KXX)-KXX-XXXX (Flash data call), the switch must be programmed in such a manner that after 911 is dialed and no other digits are received within 4 seconds (or after a # is dialed), the call will be treated as an emergency service call (911) and immediately processed. If additional digits are received within the 4-second time period, the call will be treated as a non-emergency call and handled appropriately.

```
ADD-WABE:CD=911,DAR=TIE,CHECK=N;
```

```
ADD-WABE:CD=*3,DAR=FLASH,CHECK=N;

ADD-RICHT:MODE=LRTENEW,LRTE=911,NAME="E911",
TGRP=229,DNNO=1-1-400,ROUTOPT=NO,REROUT=NO,
ROUTATT=NO,EMCYRTT=YES;

ADD-RICHT:MODE=LRTENEW,LRTE=912,NAME="MLPP",
TGRP=229,DNNO=1-1-400,ROUTOPT=NO,REROUT=NO,
ROUTATT=NO,EMCYRTT=NO;

/* E911 */
DELETE-LODR:TYPE=ODR,ODR=98;

ADD-LODR:ODR=98,CMD=OUTPULSE,DGTS=91;

/* "DNA E911 Target" */
ADD-LODR:ODR=98,CMD=SENDCOMP;

ADD-LODR:ODR=98,CMD=END;

ADD-LODR:ODR=98,INFO="E911";

ADD-LDAT:LROUTE=911,LVAL=1,TGRP=229,
ODR=98,LAUTH=1,CARRIER=1,ZONE=EMPTY,
LATTR=NONE;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,
LDP=911-T,LROUTE=911,LAUTH=1;

/* MLPP*/
DELETE-LODR:TYPE=ODR,ODR=99;

ADD-LODR:ODR=99,CMD=OUTPULSE,DGTS=*3;

ADD-LODR:ODR=99,CMD=ECHO,FIELD=2;

ADD-LODR:ODR=99,CMD=SENDCOMP;

ADD-LODR:ODR=99,CMD=END;

ADD-LODR:ODR=99,INFO="MLPP";

ADD-LDAT:LROUTE=912,LVAL=1,TGRP=229,ODR=99,
LAUTH=1,CARRIER=1,ZONE=EMPTY,LATTR=RERTEINT;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=911-X,
LROUTE=912,LAUTH=1;
```

14.4.6.7 NI2 Precedence Level IE

When an NI2 trunk is used, the following commands must be executed.

```
CHANGE-SBCSU:STNO=SUBSCRIBER,BASICSVC=SPEECH,
OPT=FBUS,SPROT=SBNIBRI;
```

```
/* S0-BUS NI2 BRI SBNIBRI MLPP IE */
CHANGE-PRODE:KIND=PD,PDNAME=PD07,SEC=WELMAND,
SETNO=49,B19=16,B39=16;

CHANGE-PRODE:KIND=PD,PDNAME=PD07,SEC=WELNAME,
CS=5,NO=65,B00=4C;

CHANGE-PRODE:KIND=PD,PDNAME=PD07,SEC=RESTP,
PDBLK=WELHEX,NO=152,B00=41,B01=05;

CHANGE-PRODE:KIND=PD,PDNAME=PD07,SEC=ORG,
ACTIVE=Y;

/* NI-2 MLPP IE */

/* By NT-2 NET Side
CHANGE-PRODE:KIND=VARTAB,PROTVAR=NI2NET,
PDNORM=PD13,PDA1=PD02; */

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=WELMAND,
SETNO=49,B19=16,B39=16;

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=WELNAME,
CS=5,NO=65,B00=4C;

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=RESTP,
PDBLK=WELHEX,NO=152,B00=41,B01=05;

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=TIMER,
TIMERID=T309,TIMESEC=10,TIMEMS=0;

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=ORG,
ACTIVE=Y;
```

IMPORTANT: If you want to use other protocols than the existing ones from the PRODE table of the US you can add them manually (for example EURO-ISDN REF-T NET-SIDE).

14.4.6.8 DISC MSG Information Cause Values

The following commands must be executed to define the MLPP specific protocol elements.

```
/* S0-BUS NI2 BRI */
CHANGE-PRODE:KIND=PD,PDNAME=PD07,SEC=RESTP,
PDBLK=CAUIDNT,NO=08,B00=08;

CHANGE-PRODE:KIND=PD,PDNAME=PD07,SEC=RESTP,
PDBLK=CAUIDNT,NO=09,B00=09;

CHANGE-PRODE:KIND=PD,PDNAME=PD07,SEC=RESTP,
PDBLK=CAUIDNT,NO=46,B00=2E;
```

```
CHANGE-PRODE:KIND=PD,PDNAME=PD07,SEC=RESTP,
PDBLK=CAUNAME,NO=08,B00=08;

CHANGE-PRODE:KIND=PD,PDNAME=PD07,SEC=RESTP,
PDBLK=CAUNAME,NO=09,B00=09;

CHANGE-PRODE:KIND=PD,PDNAME=PD07,SEC=RESTP,
PDBLK=CAUNAME,NO=46,B00=2E;

CHANGE-PRODE:KIND=PD,PDNAME=PD07,SEC=ORG,
ACTIVE=Y;
/* S2-Trunk NI2 PRI */

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=RESTP,
PDBLK=CAUIDNT,NO=08,B00=08;

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=RESTP,
PDBLK=CAUIDNT,NO=09,B00=09;

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=RESTP,
PDBLK=CAUIDNT,NO=46,B00=2E;

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=RESTP,
PDBLK=CAUNAME,NO=08,B00=08;

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=RESTP,
PDBLK=CAUNAME,NO=09,B00=09;

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=RESTP,
PDBLK=CAUNAME,NO=46,B00=2E;

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=ORG,
ACTIVE=Y;

/* PD03 for S2 ETSI Q.931 PRI and PD05 for
S0-BUS DSS1 ETS 300 403 CAUSES  */

CHANGE-PRODE:KIND=PD,PDNAME=PDX,SEC=RESTP,
PDBLK=CAUIDNT,NO=08,B00=08;

CHANGE-PRODE:KIND=PD,PDNAME=PDX,SEC=RESTP,
PDBLK=CAUIDNT,NO=09,B00=08;

CHANGE-PRODE:KIND=PD,PDNAME=PDX,SEC=RESTP,
PDBLK=CAUIDNT,NO=46,B00=2E;

CHANGE-PRODE:KIND=PD,PDNAME=PDX,SEC=RESTP,
PDBLK=CAUNAME,NO=08,B00=08;

CHANGE-PRODE:KIND=PD,PDNAME=PDX,SEC=RESTP,
PDBLK=CAUNAME,NO=09,B00=08;

CHANGE-PRODE:KIND=PD,PDNAME=PDX,SEC=RESTP,
PDBLK=CAUNAME,NO=46,B00=2E;
```

```
CHANGE-PRODE:KIND=PD,PDNAME=PDX,SEC=ORG,
ACTIVE=Y;
```

14.4.6.9 Signal Information Element

The following commands must be executed to define the MLPP specific protocol elements.

```
/* S2-Trunk NI2 PRI */
CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=WELMAND,
SETNO=14,B12=08;

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=WELMAND,
SETNO=31,B12=08;

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=WELMAND,
SETNO=49,B12=C8;

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=RESTP,
PDBLK=WELHEX,NO=38,B00=34;

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=WELNAME,
CS=0,NO=52,B00=13;

CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=ORG,
ACTIVE=Y;
```

14.4.7 Calls in Queue to the Attendant

This section only applies to systems with Attendant Console AC-Win-MQ.

For the assignment of MLPP calls to the answer keys in the multiple queue mode use the keys SQ03-SQ06 since these keys are still unassigned.

Each MLPP level is assigned to the corresponding call type. The new call types will override all other call types and no additional feature interactions will be considered, e.g. in case of recall of a MLPP call, the call type is MLPP and not recall. NON-MLPP and routine calls are queued according to the AMO-VFGR setting (no change of processing).

IMPORTANT: For routine calls there is no explicit call queue.

14.4.7.1 Assignment of the MLPP call queues with AMO-VFGR

Example for an assignement of MLPP call queues with AMO-VFGR:

- Assign priority numbers to the new MLPP call types:

```
CHANGE-VFGR:ATNDGR=3,TYPE=PLEVLTBL,CALLTYPE=MLPP1,
PRNUMIN=0&&48,PRNUMOUT=3;

CHANGE-VFGR:ATNDGR=3,TYPE=PLEVLTBL,CALLTYPE=MLPP2,
PRNUMIN=0&&48,PRNUMOUT=4;
```

```
CHANGE-VFGR:ATNDGR=3,TYPE=PLEVLTBL,CALLTYPE=MLPP3,
PRNUMIN=0&&48,PRNUMOUT=5;

CHANGE-VFGR:ATNDGR=3,TYPE=PLEVLTBL,CALLTYPE=MLPP4,
PRNUMIN=0&&48,PRNUMOUT=6;
```

- Assign the priority numbers to the corresponding call queue keys:

```
CHANGE-VFGR:ATNDGR=3,TYPE=PRIOLEV,PRIONO=3,
ANSKEY=SQ03,PRIOLEV=2;
for MLPP calls with Flash_override level on key L3

CHANGE-VFGR:ATNDGR=3,TYPE=PRIOLEV,PRIONO=4,
ANSKEY=SQ04,PRIOLEV=2;
for MLPP calls with Flash level on key L4

CHANGE-VFGR:ATNDGR=3,TYPE=PRIOLEV,PRIONO=5,
ANSKEY=SQ05,PRIOLEV=2;
for MLPP calls with Immediate level on key L5

CHANGE-VFGR:ATNDGR=3,TYPE=PRIOLEV,PRIONO=6,
ANSKEY=SQ06,PRIOLEV=2;
for MLPP calls with Priority level on key L6
```

Activate MLPP call queues:

```
CHANGE-ZANDE:TYPE=MLPP,MCIQTAC=YES;
```

14.4.7.2 Assignment of the MLPP call queues on AC-Win-MQ Application

The assignment of the individual call types and calls based on their origin to the 12 queues is system-specific and is performed by OpenScape 4000 administration. The label on each call queue key informs the user about the type of calls in the assigned queue. You can label the fields under the source buttons:

In the *Options* menu, select *AC-Win Settings.*

Click on the *Queues* tab

Click on the desired name field and enter a text for the keys F3-F6 (e.g. P1-P4).

Minimum requirements for AC-Win-MQ:

- Windows 2000Â® suitable PC with at least: 350 MHz clock frequency
- 64 MB RAM if just AC-Win is used
- HD > 2 GByte with at least 20% free disk space
- Sound Card with active speakers or Multimedia Keyboard
- Integrated interface card (Up0E) to the communication system
- Integrated CD-ROM drive
- Graphic resolution of 1280x1024 pixels
- 19" monitor; 21" monitor recommended

14.4.8 CDR Fields (SMEO)

There are many levels of CDR activation and many record-output settings can be configured. The format of a CDR record can be very flexibly configured.

This section only describes specific aspects of the SMEO. These aspects are the output of the Precedence Level and the Service Domain in a CDR record. No further settings are necessary in order to enable the recording of these two fields.

There are only special settings to configure a CDR format including this fields and assign it to an output device. An example configuration of a format containing the fields may look like this.

```
ADD-FTBL:4,B,CTRL,1,N,CR;

ADD-FTBL:4,B,CTRL,2,N,LF;

ADD-FTBL:4,B,FORM,3,N,"* ANL 80E116X *****
0 - 0 - 200  *** SMEO *******";

ADD-FTBL:4,B,CTRL,4,N,CR;ADD-FTBL:4,B,
CTRL,5,N,LF;

ADD-FTBL:4,B,FORM,6,N,"PRECLEV :  #@  SVCDOMAIN:
#@@@@@@@@@@@@@@@@@@   ";

ADD-FTBL:4,B,CTRL,7,N,CR;

ADD-FTBL:4,B,CTRL,8,N,LF;

ADD-FTBL:4,B,FORM,9,N,"CONNTYPE : #@@@@@@@@@@
UNANS  : #@@@@@@@@@@   S";

ADD-FTBL:4,B,FORM,10,N,"UPLSERV : #@@@@@@@@@@";

ADD-FTBL:4,B,CTRL,11,N,CR;

ADD-FTBL:4,B,CTRL,12,N,LF;

ADD-FTBL:4,B,FORM,13,N,"PAY-PTY  : #@@@@@@@@@@@@@@@@@@@@@@@@

DEST-PTY ";

ADD-FTBL:4,B,FORM,14,N,": #@@@@@@@@@@@@@@@@@@@@@@@@     ";

ADD-FTBL:4,B,CTRL,15,N,CR;

ADD-FTBL:4,B,CTRL,16,N,LF;

ADD-FTBL:4,B,FORM,17,N,"CALLIPTY : #@@@@@@@@@@@@@@@@@@@@@@@@

CALLEPTY ";

ADD-FTBL:4,B,FORM,18,N,": #@@@@@@@@@@@@@@@@@@@@@@@@     ";
```

```
ADD-FTBL:4,B,CTRL,19,N,CR;

ADD-FTBL:4,B,CTRL,20,N,LF;

ADD-FTBL:4,B,FORM,21,N,"** RECORD-END
**********************************";

ADD-FTBL:4,B,CTRL,22,N,CR;

ADD-FTBL:4,B,CTRL,23,N,LF;

ADD-FTBL:4,B,CTRL,24,Y,LF;

ADD-FTBL:4,B,FIELD,1,PRECLEVL,CHAR," ",R;

ADD-FTBL:4,B,FIELD,2,SVCDOM,CHAR," ",R;

ADD-FTBL:4,B,FIELD,3,CONNTYPE,CHAR," ",L;

ADD-FTBL:4,B,FIELD,4,UNANS,CHAR," ",L;

ADD-FTBL:4,B,FIELD,5,SUPLSERV,CHAR," ",L;

ADD-FTBL:4,B,FIELD,6,CHRGEE,CHAR," ",L;

ADD-FTBL:4,B,FIELD,7,DESTPTY,CHAR," ",L;

ADD-FTBL:4,B,FIELD,8,CALLIPTY,CHAR," ",L;

ADD-FTBL:4,B,FIELD,9,CALLEPTY,CHAR," ",L;
 CHANGE-SELG:SELT,1,1,FORM04,NOFORM,TARGR00,"A22";
 CHANGE-FEASU:A,MLPP;
 ADD-WABE:*194,,,PRTY,NO;

ADD-WABE:*192,,,IMMED,NO;

ADD-WABE:*191,,,FLASH,NO;

ADD-WABE:*190,,,FLASHOV,NO;

CHANGE-ZAND:MLPP,NO,NO,NO,"SMEO",200-200-200-200-200,
NO;

CHANGE-SDAT:3260,DATA1,200,,,,,,,,,,,0-0-200-32-60,
,FLASHOV;

CHANGE-SDAT:3261,DATA1,200,,,,,,,,,,,0-0-200-32-61,
,FLASHOV;

CHANGE-SDAT:3262,DATA1,200,,,,,,,,,,,0-0-200-32-62,
,FLASHOV;
```

Using these settings, corresponding CDR records will look like this:

- MLPP call with precedence level flash (answered call)

```
* ANL 80E116X *****  0 - 0 - 200  *** SMEO *******
 PRECLEV :   1  SVCDOMAIN:  000-000-200-032-062
 CONNTYPE : INTERN          UNANS  : DUV
 SUPLSERV :
NORMAL
 PAY-PTY  : 3262                          DEST-PTY :
 3260
 CALLIPTY : 3262                          CALLEPTY :
 3260
 ** RECORD-END ***********************************
```

- MLPP call with precedence level priority (answered call)

```
* ANL 80E116X *****  0 - 0 - 200  *** SMEO *******
 PRECLEV :   3  SVCDOMAIN:  000-000-200-032-060
 CONNTYPE : INTERN          UNANS  : DUV
 SUPLSERV :
NORMAL
 PAY-PTY  : 3260                          DEST-PTY :
 3262
 CALLIPTY : 3260                          CALLEPTY :
 3262
 ** RECORD-END ***********************************
```

- Call with precedence level routine (unanswered call)

```
* ANL 80E116X *****  0 - 0 - 200  *** SMEO *******
 PRECLEV :   4  SVCDOMAIN:  000-000-200-032-061
 CONNTYPE : INTERN          UNANS  : NICHT DUV
 SUPLSERV :
RING_BACK
 PAY-PTY  : 3261                          DEST-PTY :
 3260
 CALLIPTY : 3261                          CALLEPTY :
 3260
 ** RECORD-END ***********************************
```

14.4.9 DSN Hotline Service (SMEO)

14.4.9.1 Protected Hotline Calling

Example:

- party 3360 can only call party 3362
- party 3360 can only be reached by parties 3361 and 3362

Configuration of the AMO HOTLN:

```
ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=1,DEST=3362,
PRECLEVL=FLASH;
```

Configuration of the AMO SDAT:

```
CHA-SDAT:STNO=3360,TYPE=DATA1,HOTIDX=1;
```

Configuration of the AMO BWLST:

```
ADD-BWLST:BWLIDX=1,ALLWD=YES,ALLINCAL=YES,
DESTNO=3361&3362;
```

Configuration of the AMO SDAT:

```
CHA-SDAT:STNO=3360,TYPE=DATA1,BWLIDX=1;
```

14.4.9.2 Pair Protected Hotline Calling

Example:

- party 3360 can only call party 3362
- party 3362 can only call party 3360
- party 3360 can only be reached by party 3362
- party 3362 can only be reached by party 3360

Configuration of the AMO HOTLN:

```
ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=1,DEST=3362,
PRECLEVL=FLASH;

ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=2,DEST=3360,
PRECLEVL=FLASH;

ADD-BWLST:BWLIDX=1,ALLWD=YES,ALLINCAL=NO,
DESTNO=3362;

ADD-BWLST:BWLIDX=2,ALLWD=YES,ALLINCAL=NO,
DESTNO=3360;
```

Configuration of the AMO BWLST:

Configuration of the AMO SDAT:

```
CHA-SDAT:STNO=3360,TYPE=DATA1,HOTIDX=1;

CHA-SDAT:STNO=3362,TYPE=DATA1,HOTIDX=2;

CHA-SDAT:STNO=3360,TYPE=DATA1,BWLIDX=1;

CHA-SDAT:STNO=3362,TYPE=DATA1,BWLIDX=2;
```

14.4.9.3 Unprotected Hotline Receiving

Example:

- party 3360 can only call party 3362
- party 3360 can be reached by every party

Configuration of the AMO HOTLN:

```
ADD-HOTLN:TYPE=HOTDEST,HTLNIDX=1,DEST=3362,
```

```
PRECLEVL=FLASH;
```

Configuration of the AMO SDAT:

```
CHA-SDAT:STNO=3360,TYPE=DATA1,HOTIDX=1;
```

14.4.9.4 Protected Hotline Receiving

Example:

- party 3360 can call every party
- party 3360 can only be reached by parties 3361 and 3362

Configuration of the AMO BWLST:

```
ADD-BWLST:BWLIDX=1,ALLWD=YES,ALLINCAL=YES,
DESTNO=3361&3362;
```

Configuration of the AMO SDAT:

```
CHA-SDAT:STNO=3360,TYPE=DATA1,BWLIDX=1;
```

14.4.10 Outgoing and tandem call trace (SMEO)

The administration of the B/W list which keeps the destination numbers "to be traced" is done by AMO BWLST.

14.4.10.1 Creating a new list

IMPORTANT: The external destination numbers will always be stored in the list with index 500. This is the maximal value that the AMO allows to be entered and it must be configured in order that the feature works.

IMPORTANT: Depending on the network configuration (closed or open numbering, settings from KNMAT, KNDEF or KNPRE or other number modifications), the destinations have to be added to the list accordingly, with or without prefix digits.

Example of creating the list containing the number 12345 which needs to be traced:

```
ADD-BWLST:BWLIDX=500,DESTNO=12345;
```

From this point on, the calls initiated from any station towards the destination number 12345 will be traced on the terminal, indicating the calling and called parties.

IMPORTANT: The AMO does not check if the entered destinations are valid numbers.

IMPORTANT: Special characters # and * can be used as wildcards: # replaces one digit in the range of 0...9, on its position. * replaces one or more digits each in the range of 0...9, starting from its position.

For example:

123#5 replaces 12305, 12315, 12325 .....12395.

123* replaces 1230, 12301, 12311, etc.

IMPORTANT: The parameters ALLWD and ALLINCAL can be ignored.

14.4.10.2 Displaying the list of destination numbers that will be traced

Example of displaying the list of destination numbers that will be traced:

```
DISPLAY-BWLST:TYPE=BWLIST,BWLIDX=500;
```

The result of the display looks like this:

```
+-------------------------------------------------------------------------+
| BLACK/WHITE LIST IDX: 500                                               |
+-------------------------------------+-----------------------------------+
|             WHITE LIST              |          ALL INCOMING CALLS       |
+-------------------------+-----------+-----------+-----------------------+
| 11#1                    | 12345                 | 678*                  |
+-------------------------+-----------------------+-----------------------+
```

14.4.10.3 Adding a new destination number to the list

Example of adding the external destination 98765.

```
ADD-BWLST:BWLIDX=500,DESTNO=98765;
```

14.4.10.4 Deleting a number from the list

Example of deleting the external destination 98765.

```
DELETE-BWLST:BWLIDX=500,DESTNO=98765;
```

14.4.10.5 Deleting the list of destination numbers to be traced

Example of deleting the list of destination numbers to be traced:

```
DELETE-BWLST:BWLIDX=500;
```

14.4.11 Further Information

To get the desired functionality the following needs to be done:

14.4.11.1 Change host to aLaw

- Coding for conf STMI etc.
  CHANGE-ZAND:TYPE=CONFC,CODE=ALAW;
- SLMA attenuation
  CHANGE-ZAND:TYPE=ALLDATA,CNTRYCD=0;
- /* SIU to aLaw
  CHANGE-ZAND:TYPE=TN,SIUC=V,DTR=0;
- /* DTMF to aLaw

  CHANGE-ZAND:TYPE=SIUXPER,LEVDTMF=0;
- /* optiPoint/OpenStage/CP400/CP600 phones europe

  CHANGE-ZAND:TYPE=OPTISET,ACOUSTID=EUROPE;
- /* AC-Win-MQ to aLaw
  CHANGE-ZAND:TYPE=ATND,ACCNTRY=0;
- /* Update und reload SWU

  EXEC-UPDAT:UNIT=BP,SUSY=ALL;

  EXEC-REST:TYPE=UNIT,UNIT=BP,RSLEVEL=RELOAD;

  Accept BC aLaw in NI2 setup message (European market only)

  CHANGE-PRODE:KIND=PD,PDNAME=PD13,SEC=RESTP,
  PDBLK=BCLLCL1,NO=2,B00=23;

14.4.11.2 Change host to uLaw

- /* coding for conf Stmi etc.
  CHANGE-ZAND:TYPE=CONFC,CODE=ULAW;
- /* SLMA attenuation
  CHANGE-ZAND:TYPE=ALLDATA,CNTRYCD=K;
- /* SIU set to DSN uLaw
  CHANGE-ZAND:TYPE=TN,SIUC=W,DTR=K;
- /* DTMF set to uLaw
  CHANGE-ZAND:TYPE=SIUXPER,LEVDTMF=1;
- /* optiPoint/OpenStage/CP400/CP600 phones to USA
  CHANGE-ZAND:TYPE=OPTISET,ACOUSTID=USA;
- /* AC-Win-MQ to uLaw
  CHANGE-ZAND:TYPE=ATND,ACCNTRY=1;
- /* Update und reload SWU
  EXEC-UPDAT:UNIT=BP,SUSY=ALL;

  EXEC-REST:TYPE=UNIT,UNIT=BP,RSLEVEL=RELOAD;

14.4.11.3 Law conversion on AP3700IP

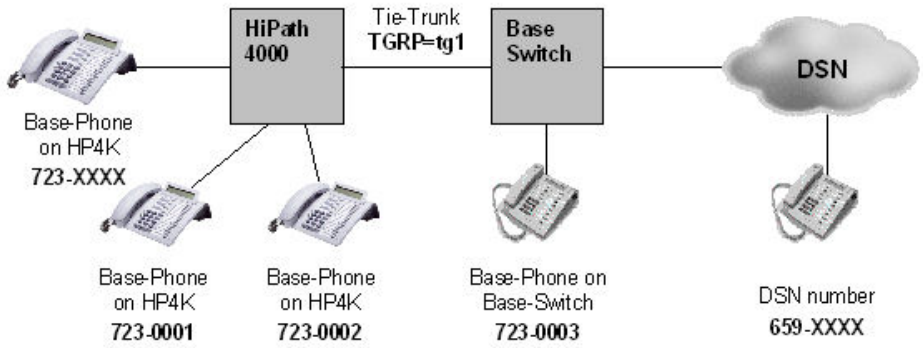
Configuration example for IP AccessPoint on LTG 17 (213=alaw, 255=ulaw).
These commands must be executed prior to configuring the trunks.

```
CHANGE-STMIB:MTYPE=STMI,LTU=1,SLOT=97,
TYPE=GLOBAL,PATTERN=213;

RESTART-BSSU:ADDRTYPE=PEN,LTG=1,LTU=1,SLOT=97;

DEACTIVATE-USSU:LTG=1,LTU=17;

CHANGE-STMIB:MTYPE=NCUI,LTU=17,TYPE=GLOBAL,
PATTERN=213;

CHANGE-UCSU:UNIT=AP,LTG=1,LTU=17,CONVLAW=YES;

ACTIVATE-USSU:UNIT=LTG,LTG=1,LTU=17;

EXEC-USSU:MODE=UPDATAP;

EXEC-USSU:MODE=UPDATAP;
```

14.4.11.4 Number Routing on US Military Bases

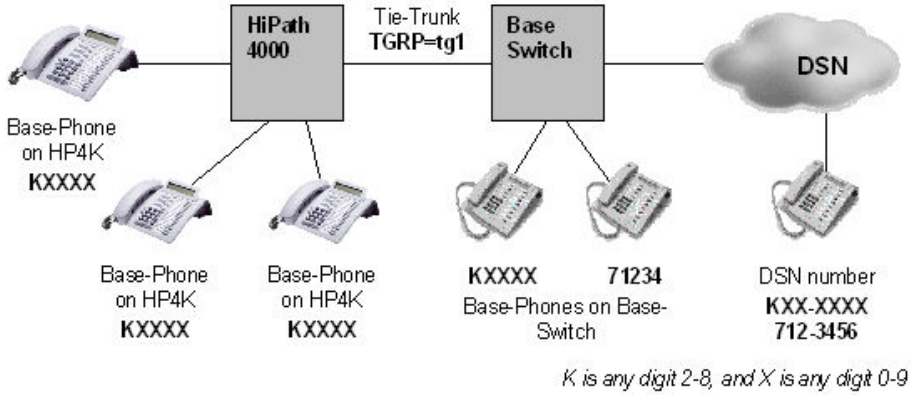
14.4.11.4.1 Number Routing for 7-digit On-Base-Numbers

On US military bases telephones can be connected to the OpenScape 4000 and to the Base Switch. This document describes how the OpenScape 4000 can be configured to route calls to OpenScape 4000 phones, base-switch-phones, and DSN-calls correctly.



14.4.11.4.2 Number Routing for 5-digit On-Base-Numbers

If Base Numbers don't comply with the GSCR (see Section 174.1, "Interswitch and Intraswitch Dialing"), phone numbers can create a conflict with DSN numbers (see example below).



This document also describes a possible workaround for US military bases with a conflicting dial plan.

14.4.11.4.3 7-digit On-Base-Number Configuration Example

In order to route base numbers correctly all dialed numbers have to be analyzed by the Dialing Plan Administration LDPLN.

On-Base-Numbers residing within the OpenScape 4000 or on the Base Switch have to be sent to LDPLN using the Office Code as the routing digits (723 in this example).

```
ADD-WABE:CD=723,DAR=TIE;
```

All other DSN calls have to be configured with WABE and TIE as well.

Station-Numbers within the OpenScape 4000 need to be rerouted back into the OpenScape 4000 using the parameter LATTR set to RERTEINT in the AMO LDAT.

Since the number for the station is already used as a TIE a token number has to be configured for each station within the OpenScape 4000 (in this example 98XXXX is used to build the token number).

```
ADD-WABE:CD=980001,DAR=STATION;

ADD-WABE:CD=980002,DAR=STATION;

...
```

It is recommended to turn off displaying the station number since the OpenScape 4000 shows the station number (in this case it would be the token number 98xxxx).

```
CHANGE-ZAND:TYPE=ALLDATA2,DSPOWNNO=NO;
```

The Out-Dial rule for the OpenScape 4000 stations replaces the office code with 98 and dials the new token number.

```
ADD-LODR:ODR=odr98,CMD=OUTPULSE,DGTS=98;

ADD-LODR:ODR=odr98,CMD=ECHO,FIELD=2;

ADD-LODR:ODR=odr98,CMD=END;
```

The AMO LDAT specifies that this route has to be rerouted back into the OpenScape 4000 (LATTR=RERTEINT).

```
ADD-LDAT:LROUTE=lrt98,ODR=odr98,LAUTH=x,
LATTR=RERTEINT;
```

All the OpenScape 4000 internal numbers have to be routed to the OpenScape 4000 internal route.

```
ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,
LDP=723-0001,LROUTE=lrt98,LAUTH=x;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,
LDP=723-0002,LROUTE=lrt98,LAUTH=x;
```

All calls to the base-switch and DSN are routed together using the configuration below:

```
ADD-LODR:ODR=odrx,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=odrx,CMD=ECHOALL;

ADD-LDAT:LROUTE=lrtx,LVAL=1,TGRP=tgx,
ODR=odrx,LAUTH=x;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,
LDP=723-XXXX,LROUTE=lrtx,LAUTH=x;
```

14.4.11.4.4 5-digt On-Base-Number Configuration Example

The OpenScape 4000 uses the timer LCREOD to determine whether a 5 digit number is dialed. If there is no other digit dialed within this timer (or if the user dials the pound "#') the OpenScape 4000 assumes that all digits are dialed and routes them accordingly.

The timer LCREOD (LCR End Of Dialing) is used for dialing supervision and can be changed with the AMO-CTIME (recommended value 4 seconds):

```
CHA-CTIME:TYPESWU=CP1,LCREOD=4;
```

The digits 2 through 8 have to be configured as a routing digit since 2 to 8 are possible start digits for DSN numbers (see Section 174.1, "Interswitch and Intraswitch Dialing").

```
ADD-WABE:CD=2,DAR=TIE;

ADD-WABE:CD=3,DAR=TIE;

ADD-WABE:CD=4,DAR=TIE;

ADD-WABE:CD=5,DAR=TIE;

ADD-WABE:CD=6,DAR=TIE;

ADD-WABE:CD=7,DAR=TIE;

ADD-WABE:CD=8,DAR=TIE;
```

OpenScape 4000 internal stations need to be configured with a token number since the "real" station numbers are used to route the calls (in this example 1 is added to the on base number KXXXX):

```
ADD-WABE:CD=171234,DAR=STATION;

ADD-WABE:CD=181234,DAR=STATION;

...
```

It is recommended to turn off displaying the station number since the OpenScape 4000 shows the station number (in this case it would be the token number 98xxxx).

```
CHANGE-ZAND:TYPE=ALLDATA2,DSPOWNNO=NO;
```

A route needs to be configured to be used later in the AMO LDAT:

```
ADD-RICHT:MODE=LRTENEW,LRTE=lrt1,LSVC=VCE,
NAME="ROUTE OpenScape 4000",TGRP=tg1;
```

The AMO LODR (Out-Dial Rule) adds a 1 to the KXXXX and dials the token number 1KXXXX:

```
ADD-LODR:ODR=ODR1,CMD=OUTPUSLE,DGTS=1;

ADD-LODR:ODR=ODR1,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=ODR1,CMD=END;
```

AMO LDAT specifies that the dialed number has to be rerouted back to the OpenScape 4000, LATTR=RERTEINT:

```
ADD-LDAT:LROUTE=LRT1,LVAL=1,TGRP=TG1,
ODR=ODR1,LAUTH=1,LATTR=RERTEINT;
```

All on-base-numbers within the OpenScape 4000 have to be configured individually with a timeout as an indication that the number is complete if there is no additional digit dialed (or '#') within the timeout.

```
ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=7-1234-T,
LROUTE=lrt1,LAUTH=1;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=8-1234-T,
LROUTE=lrt1,LAUTH=1;

...
```

Numbers that don't reside within the OpenScape 4000 can be routed immediately to the base switch.

Route to the base switch:

```
ADD-RICHT:MODE=LRTENEW,LRTE=lrt2,LSVC=VCE,
NAME="RTE TO BASE",TGRP=tg1;
```

Out-Dial Rule for calls to the base switch:

```
ADD-LODR:ODR=ODR2,CMD=ECHO,FIELD=1;

ADD-LODR:ODR=ODR2,CMD=ECHOALL;

ADD-LODR:ODR=ODR2,CMD=END;
```

LDAT for calls to the base switch:

```
ADD-LDAT:LROUTE=LRT2,LVAL=1,TGRP=TG1,ODR=ODR2,
LAUTH=1;
```

Dial-Patterns of all calls to base switch phones:

```
ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=2-XXXX-T,
LROUTE=lrt2,LAUTH=1;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=3-XXXX-T,
LROUTE=lrt2,LAUTH=1;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=4-XXXX-T,
LROUTE=lrt2,LAUTH=1;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=5-XXXX-T,
LROUTE=lrt2,LAUTH=1;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=6-XXXX-T,
LROUTE=lrt2,LAUTH=1;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=7-XXXX-T,
LROUTE=lrt2,LAUTH=1;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=8-XXXX-T,
LROUTE=lrt2,LAUTH=1;
```

Dial-Patterns of all calls to the DSN:

```
ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=2-XXXX-Z,
LROUTE=lrt2,LAUTH=1;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=3-XXXX-Z,
LROUTE=lrt2,LAUTH=1;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=4-XXXX-Z,
LROUTE=lrt2,LAUTH=1;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=5-XXXX-Z,
LROUTE=lrt2,LAUTH=1;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=6-XXXX-Z,
LROUTE=lrt2,LAUTH=1;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=7-XXXX-Z,
LROUTE=lrt2,LAUTH=1;

ADD-LDPLN:LCRCONF=LCRPATT,DIPLNUM=0,LDP=8-XXXX-Z,
LROUTE=lrt2,LAUTH=1;
```

14.4.11.5 Setting the Precedence-Digit representation and the Route Digit on CAS Outpulsing

The AMO COP controls all the Class of Protocols including the Precedence-Digit and the Route-Digit on CAS Outpulsing.

PDIG alone (makes sense for DTMF only)

1st Digit A...D is handled as MLPP Precedence Digit

2nd Digit 1...9 is handled as dialing and the MLPP Level Routine is used

For a Precedence-Letter (A, B, C, or D) without the Route-Digit following COP parameters have to be set / omitted:

Set: PDIG; Omit: RDIG & PNIO;

CHA-COP:COPNO=XX,COPTYPE=COPADD,PAR=PDIG; CHA-COP:COPNO=XX,COPTYPE=COPDEL,PAR=RDIG&PNIO;

PDIG and RDIG (PNIO isn't used)

1st Digit is handled as MLPP Precedence Digit.

2nd Digit handled as MLPP Rout Code Digit.

For a numeric Precedence-Digit Digit (0, 1, 2, 3, or 4) and the Route-Digit following COP parameters have to be set / omitted:

SET: PDIG & RDIG; Omit: PNIO;

CHA-COP:COPNO=XX,COPTYPE=COPADD,PAR=PDIG&RDIG; CHA-COP:COPNO=XX,COPTYPE=COPDEL,PAR=PNIO;

PDIG and PNIO (makes sense for Pulse-Dialing)

1st Digit is handled as MLPP Precedence Digit.

The Digits 0...4 are sent. For receiving Digits the system eccepts all Digits.

For a Precedence-Digit (0, 1, 2, 3, or 4) without the Route-Digit following COP parameters have to be set / omitted:

Set: PDIG & PNIO; Omit: RDIG;

CHA-COP:COPNO=XX,COPTYPE=COPADD,PAR=PDIG&PNIO; CHA-COP:COPNO=XX,COPTYPE=COPDEL,PAR=RDIG;

14.5 User interface

14.5.1 Originating User

The user activates precedence calls by dialing a code on a per call basis.

If the originating user is not authorized for the dialed precedence level or for protected calls, the call attempt will be rejected, the user will be connected to Unauthorized Precedence Announcement and the message "nicht berechtigt"/"Not authorized" will be displayed on the optiPoint/OpenStage/ CP400/CP600 device.

If the called MLPP subscriber is busy with a call of the same or higher precedence level or with a call from a different service domain, the originating user will be connected to Blocked Precedence Announcement and the message "bitte wiederholen"/"Please try later" will be displayed on the optiPoint/ OpenStage/CP400/CP600 device.

If the called MLPP subscriber is idle, the calling station will receive precedence ringback tone and message "PRECEDENCE CALL" on the display while the called subscriber is ringing. After 4 seconds or when the called subscriber answers the call, the calling station will show the MLPP level in addition to the existing informations (called number, name), if administered.

If the called MLPP subscriber is busy with a call of the same or higher precedence level and call waiting for the called party is activated, the originating user will receive precedence ringback tone.

If the called MLPP subscriber is assigned as non-preemptible, the calling party will receive "geschuetzt/Protected" and Busy Not Equipped Announcement.

If the precedence call reaches an attendant queue, the user will be connected to Attendant Queue Announcement.

If the originating user originates a precedence call to a nonexistent number, the user will be connected to Vacant Code Announcement.

If technical problems make origination of a precedence call impossible, the user will be connected to Isolated Code Announcement.

In case of the DSN Hotline, the user activates the hotline calls by initiating a service request (usually hook-off). The call receives a precedence level automatically, administered earlier. If the called subscriber has a configured Black/White list, it will be checked to see whether the present call is allowed. If not, the originating user will not be connected to the Announcement and the message "bitte wiederholen"/"Please try later" will be displayed on the optiPoint/ OpenStage/CP400/CP600 device. In other cases, the procedure is as for simple MLPP calls.

Notes

- All calls which are initiated without using a prefix, are MLPP Routine calls.
- An attendant console gets the authorization for all MLPP levels (ROUTINE, PRTY, IMMED, FLASH, FLASHOV) with activation of MLPP in FEASU.

14.5.2 Destination User

14.5.2.1 Called MLPP subscriber is idle

If an MLPP subscriber is idle and is seized with a MLPP call, the display message at the called station will show the MLPP level in addition to the existing informations (calling number, name), if administrated. A special ringing rhythm for precedence calls (one for all levels) may be administered.

14.5.2.2 Called MLPP subscriber is busy (with camp on)

If an MLPP subscriber is busy with a call of the same or higher level or with a call from a different service domain, during the camp-on phase the display will be the same as in ringing state and the user will hear precedence call waiting tone.

14.5.2.3 Called MLPP subscriber busy (without camp on)

At the moment of preemption the display will change from the information about "old" connection to an information, that a precedence call is waiting: "Prioritaetsanruf wartet"/"Precedence call waiting", and the user will be connected to preemption notification tone. After the called party has gone on-hook and rering starts, the display will be the same as in ringing state.

IMPORTANT: The attendant console is implicitly protected against preemption by precedence calls.

14.5.3 Invocation and operation

- Initiating precedence calls - dialing access code + number
  1) The access code for the precedence level and the dialed extension number appears as the user types them. While dialing no extra signalling will be done.
  2) In case of the DSN Hotline, the feature may be started in the following ways:
     - hook-off
     - press the speaker button
     - press a direct call button
     - press a line button on a keyset
     - press a digit button
- Precedence call to an idle subscriber
  1) On the display of the originating user the text "PRECEDENCE CALL" appears, 4 seconds later the MLPP level in addition to the existing information (called number, name) will be displayed.
  2) The destination user hears precedence call ring tone and the display shows the MLPP level in addition to the existing information (calling number, name).

- Preempting a call successfully

  1) After dialing the access code and the extension number the text "PRECEDENCE CALL" appears on the display of the originating user. It also hears precedence ringback tone.

  2) The text "PRECEDENCE CALL WAITING" appears on the display of the destination user.

  3) The destination user hears preemption notification tone. The original call of the destination user will be disconnected.

  4) The original partner of the destination user hears preemption notification tone. The call will be disconnected

  5) When the destination user goes on-hook, he will hear precedence call ringing immediately.

- Unsuccessful precedence call attempt

  1) After dialing the access code and the extension number

  2) The originating user hears Blocked Precedence Announcement "(Switch name and location.) Equal or higher precedence calls have prevented completition of your call. Please hang up and try again. This is a recording. (Switch name and location)".

- Initiating precedence call with unauthorized precedence level

  1) After dialing the access code the text "NOT AUTHORIZED" appears on the display of the originating user.

  2) the originating user hears Unauthorized Precedence level Announcement

  "(Switch name and location.)

  The precedence used is not authorized for your line.

  Please use an authorized precedence or ask you attendant for assistance.

  This is a recording.

  (Switch name and location)".

14.5.4 Announcements

- Connecting to announcements when there are free announcement resources available

  The party starts hearing the recorded message immediately. When the announcement finishes, the party will be disconnected from the announcement.

- Connecting to announcements when there are no free announcements available

  The user will hear a predefined tone while waiting for an announcement resource to become available. When the announcement resource becomes available, the party starts hearing the recorded message immediately. When the announcement finishes, the party will be disconnected from the announcement.

14.5.5 Precedence Call Diversion

Diversion of unanswered precedence call

Originating user calls destination user with precedence call. Destination user is alerting with precedence ringing.

Destination user does not answer within a period of time.

Call is diverted to the diversion destination.

14.5.6 Precedence Call Waiting

Camping on by a lower or equal precedence call or by a call from a different service domain

After dialing the access code and the extension number the text "PRECEDENCE CALL" appears on the display of the originating user.

The destination user hears precedence call waiting tone.

When the destination user goes onhook, it will hear precedence call ringing immediately.

14.5.7 Call Forwarding

- Unconditional call forwarding at an idle station
  1) Originating user dials the precedence level access code followed by the extension number of the destination party
  2) The call is forwarded immediately to the call forwarding destination of the destination user. The rules of MLPP will apply to the call forwarding destination.
- Preemption at a busy station that has call forwarding activated
  1) Originating user dials the precedence level access code followed by the extension number of the destination user. The destination user is busy. It also has unconditional call forwarding activated.
  2) The call is not forwarded. The original call of the destination user is preempted.
- Call forward on no reply
  1) Originating user dials the precedence level access code followed by the extension number of the destination user. The destination user starts hearing precedence ringing.
  2) The destination user does not answer. The call is forwarded to a new party. The destination user stops ringing, the new party starts precedence ringing.

14.5.8 Three Way Calling

- Preemption of whole conference

  When a conference is preempted because of the lack of conference resources, all of its members will receive Preemption Notification Tone. All of the members must go onhook as an acknowledgement.

14.5.9 Defense Switched Network World Wide Numbering and Dialing Plan

The administrator may configure Defense Switched Network World Wide Numbering and Dialing Plan for

- Access Digit, Precedence or Service Digit, Route Code, Area Code, Switch Code and Line Number
- Seven-Digit and Ten-Digit Dialing.

14.5.10 Calls in Queue to the Attendant

Realization of the calls in queue will be done by mapping each precedence level to a specific attendant queue. Each queue has its own key on the attendant console. The administrator has to assign the description text for the different precedence levels to the corresponding call queue keys on the attendant console. The attendant has the ability to get the calls with the higher precedence first by hitting the key for the queue of the higher precedence first. This function is available on AC-Win-MQ only.

14.5.11 Call Waiting for Anate

14.5.11.1 Feature Description

Analog station user can use the "call waiting" feature. Pressing the flash key on the anate the user may switch between parties (hold and toogle).

14.5.11.2 Service Information

No CSTA/ACL-C support.

14.5.11.3 Generation (Example)

Activate override in multiple states:
`CHANGE-ZAND:TYPE=ALLDATA,OVRMST=YES;`

Call waiting for anate:
`CHANGE-SDAT:STNO=<station_number>,`
`TYPE=ATTRIBUT,AATTR=ANATECW;`

WABE code for call waiting:

- Activation with *89
  `ADD-WABE:CD=*89,DAR=ACTCW;`

- Deactivation with #89
  `ADD-WABE:CD=#89,DAR=DEACW;`

  Feature activation at the station:

  Anate hooks-off and dial WABE code *89 for feature activation; confirmation tone is received; anate hooks-on.

  Feature deactivation at the station:

  Anate hooks-off and dial WABE code #89 for feature deactivation, confirmation tone is received; anate hooks-on

14.5.11.4 Relevant AMOs

AMO	Parameter	Sprache/ Language	Beschreibung/ Description
SDAT	ANATECW	d	Anklopfen für Anate
	ANATECW	e	Call waiting for anate
WABE	CWEIN	d	Anklopfen für Anate aktivieren
	ACTCW	e	Activate call waiting for anate
	CWAUS	d	Anklopfen für Anate deaktivieren
	DEACT	e	Deactivate call waiting for anate
ZAND	AUFSMZST	d	Aufschalten auf Gespräche in mehreren Zuständen
	OVRMST	e	Override in multiple states

14.6 Generic Switching Center Requirements (GSCR)

14.6.1 Interswitch and Intraswitch Dialing

[Required: TS, EOS, SMEO, MFS, PBX1 - Conditional: PBX2] Seven-digit intraswitch dialing options as well as 7-and 10-digit interswitch dialing shall be supported by DSN Switches.

14.6.2 Seven-Digit Dialing

[Required: TS, EOS, SMEO, MFS, PBX1] Seven-digit dialing shall consist of using the seven digits of the switch code and line number to establish either inter- or intra-switch calls within the same numbering plan area. Number assignments for this plan shall be of the form KXX-XXXX, where X is any digit 0-9 and K is any digit 2 - 8. The specific KXX of each switch will be assigned by DISA to preclude conflicts with other switch codes. Access to the local attendant shall be obtained by dialing 0. DSN ROUTINE 7-digit inter- or intra-switch calls

are initiated by dialing the appropriate sequence of (1X) KXX-XXXX or 94 (1X) KXX-XXXX. DSN calls above ROUTINE precedence are initiated by the appropriate sequence of 9P (1X) KXX-XXXX where P is the precedence digit (0, 1, 2, or 3). Access to other Government and/or commercial services is obtained by dialing 9 followed by the appropriate service digit(s).

7 digits (eg. 624xxxx) the solution is to configure in WABE a code DAR=OWNNODE with parameter ARN that match the first digit of the real exetension. With this configuration you can call the extensions with 6 or 7 digits (240XXX or 6240xxx). Then in ZAND:ALLDATA the parameter SEVDIG=YES to send the calling information in 7 digits

DIGIT INTERPRETATION VALID FOR ALL DIAL PLANS

	CALL PROGRESS STATE	DIGIT	RESERVED/ CONVERT
CODE	1 11111 11112 22	ANALYSIS	DNI/ADD-INFO
	0 12345 67890 12345 67890 12	RESULT	*=OWN NODE

624	. .**** ***** *...	OWNNODE	
			ARN 24
240500 - 240599	. .**** ***** *...	STN	
			DESTNO 0
			DNNO 0- 0-104*

14.6.3 Ten-Digit Dialing

[Required: TS, EOS, SMEO, MFS, PBX1] Ten-digit dialing shall consist of using 10 digits comprising the area code, switch code, and line number to establish inter-switch calls where the number plan area of the calling party is different from the number plan area of the called party. Number assignments for this plan shall be of the form KXX-KXX-XXXX, where K is any digit 2-8, and X is any digit 0-9. DSN ROUTINE 10-digit inter-switch calls are initiated by dialing the appropriate sequence of (1X) KXX-KXX-XXXX or 94 (1X) KXX-KXX-XXXX. DSN calls above ROUTINE precedence are initiated by the appropriate sequence of 9P (1X) KXX- KXX-XXXX where P is the precedence digit (0, 1, 2, or 3). Access to other Government and/or commercial services is obtained by dialing 9 followed by the appropriate service digit(s).

For example, please refer to OpenScape 4000 V8, Volume 1: AMO Descriptions, Service Documentation, chapter WABE - Digit Analysis.

14.6.4 Emergency Service 911 Conflict Resolution

[Required: MFS, EOS, SMEO, PBX1] To prevent conflicts between 911 (emergency service) and 91-11-(KXX)-KXX-XXXX (Flash data call), the switch shall be programmed in such a manner that after 911 is dialed and no other digits are received within 4 seconds (or after a # is dialed), the call will be treated as an emergency service call (911) and immediately processed. If additional digits are received within the 4-second time period, the call will be treated as a non-emergency call and handled appropriately.

15 COP and COT Parameter

15.1 Default values for COP and COT

There are many default COT and COP parameters on the hard-disk. These are each predefined for a certain country. You can determine which parameters are relevant for which country from the variant table (see Section 175.4, "Variant table and value in the database for COT" and Section 175.3, "Variant table and value in the database for COP").

With a variant table, a certain COT or COP can be copied to the database via COPY-COT or COPY-COP.

15.1.1 Default parameters for COP

The following is a short excerpt from the COP parameters.

You can retrieve these at the system with `DISP-COP:SOURCE=HD;`.

```
DISP-COP:SOURCE=HD;

H500:  AMO COP   STARTED


    COP:   1  INFO: 10: AMT IKZ O. ABWURF

   DEVICE: DP           SOURCE: HD

   PARAMETER:

        DUALTONE MULTIPLEFREQUENCY

DTMF

        LINE WITH START-DIAL-SIGNAL

SDL

        START-DIALING-SIGNAL TIMER 1 (AMO DTIM2: PARAMETER
 STADIAL1)
TIM1

        PREDIALING DELAY 2 (AMO DTIM2: PDLY2)

PDP2

        MAKE/BREAK RATIO FOR DTMF 3
 (PULSE=200MS,PAUSE=200MS)
DTM3


    CO TRUNK ACCESS:
```

```
        TRUNK ACCESS

TA


    TOLL ACCESS:

        TRUNK ACCESS

TA


    COP:   2  INFO: 11: AMT IKZ M. ABWURF

   DEVICE: DP           SOURCE: HD

   PARAMETER:

        DUALTONE MULTIPLEFREQUENCY

DTMF

        LINE WITH START-DIAL-SIGNAL

SDL

        START-DIALING-SIGNAL TIMER 1 (AMO DTIM2: PARAMETER
 STADIAL1)
TIM1

        PREDIALING DELAY 2 (AMO DTIM2: PDLY2)

PDP2

        MAKE/BREAK RATIO FOR DTMF 3
 (PULSE=200MS,PAUSE=200MS)
DTM3


    CO TRUNK ACCESS:

        TRUNK ACCESS

TA


    TOLL ACCESS:

        TRUNK ACCESS

TA


    COP:   3  INFO: 12: AMT HKZ

   DEVICE: MOSIG        SOURCE: HD
```

```
   PARAMETER:

        DUALTONE MULTIPLEFREQUENCY

DTMF

        LINE WITH START-DIAL-SIGNAL

SDL

        START-DIALING-SIGNAL TIMER 1 (AMO DTIM2: PARAMETER
 STADIAL1)
TIM1

        PREDIALING DELAY 2 (AMO DTIM2: PDLY2)

PDP2

        MAKE/BREAK RATIO FOR DTMF 3
 (PULSE=200MS,PAUSE=200MS)
DTM3


    CO TRUNK ACCESS:

        TRUNK ACCESS

TA


    TOLL ACCESS:

        TRUNK ACCESS

TA


    COP:   4  INFO: 20: S0/2 AMT EDSBRD O. ABWURF

   DEVICE: S2COD        SOURCE: HD

   PARAMETER:

   CO TRUNK ACCESS:

        TRUNK ACCESS

TA


    TOLL ACCESS:

        TRUNK ACCESS

TA
```

```
    COP:   5  INFO: 21: S0/2 AMT EDSBRD M. ABWURF

   DEVICE: S2COD        SOURCE: HD

   PARAMETER:


    CO TRUNK ACCESS:

        TRUNK ACCESS

TA


    TOLL ACCESS:

        TRUNK ACCESS

TA


    COP:   6  INFO: LEER / NOT USED

   DEVICE: S2COD        SOURCE: HD

   PARAMETER:

        NO PARAMETER VALUES ASSIGNED
```

and so on.

15.1.2 Default parameters for COT

The following is a short excerpt from the COT parameters.

You can retrieve these at the system with `DISP-COT:SOURCE=HD;`.

```
DISP-COT:SOURCE=HD;

H500:  AMO COT   STARTED


    COT:   1  INFO: 10: AMT IKZ O. ABWURF

   DEVICE: DP           SOURCE: HD

   PARAMETER:

        LINE WITH ADVANCED END-OF-DIAL TRANSMISSION

AEOD
```

```
        DON'T RELEASE CALL TO BUSY HUNT GROUP

BSHT

        SEND NO NODE NUMBER TO PARTNER

LWNC

        INCOMING CIRCUIT FROM SYSTEM WITHOUT LCR

NLCR

        USE DEFAULT NODE NUMBER OF LINE

DFNN

        INCOMING CIRCUIT FROM SYSTEM WITHOUT LCR (DATA)

NLRD

        NO TONE

NTON


    COT:   2  INFO: 11: AMT IKZ M. ABWURF

   DEVICE: DP           SOURCE: HD

   PARAMETER:

        ATTENDANT INTERCEPT WHEN DIALING INCOMPLETE

IIDL

        ATTENDANT INTERCEPT WHEN VACANT

IVAC

        ATTENDANT INTERCEPT WHEN BUSY

IBSY

        ATTENDANT INTERCEPT WHEN UNAUTHORIZED

INAU

        ATTENDANT INTERCEPT WHEN ALL TRUNKS BUSY
 (CONGESTION)
ITB

        ATTENDANT INTERCEPT WHEN DO-NOT-DISTURB IS
 ACTIVATED
IDND
```

```
        ATTENDANT INTERCEPT WHEN FREE (AFTER TIMEOUT)
IFR
        LINE WITH ADVANCED END-OF-DIAL TRANSMISSION
AEOD
        DON'T RELEASE CALL TO BUSY HUNT GROUP
BSHT
        SEND NO NODE NUMBER TO PARTNER
LWNC
        INCOMING CIRCUIT FROM SYSTEM WITHOUT LCR
NLCR
        USE DEFAULT NODE NUMBER OF LINE
DFNN
        INCOMING CIRCUIT FROM SYSTEM WITHOUT LCR (DATA)
NLRD
        NO TONE
NTON

    COT:   3  INFO: 12: AMT HKZ
   DEVICE: MOSIG        SOURCE: HD
   PARAMETER:
        DON'T RELEASE CALL TO BUSY HUNT GROUP
BSHT
        SEND NO NODE NUMBER TO PARTNER
LWNC
        INCOMING CIRCUIT FROM SYSTEM WITHOUT LCR
NLCR
        USE DEFAULT NODE NUMBER OF LINE
DFNN
```

```
        INCOMING CIRCUIT FROM SYSTEM WITHOUT LCR (DATA)
NLRD

        NO TONE
NTON


    COT:   4  INFO: 20: S0/2 AMT EDSBRD O. ABWURF
   DEVICE: S2COD        SOURCE: HD
   PARAMETER:
        RECALL IF USER HANGS UP IN CONSULTATION CALL
RCL

        TRUNK SIGNALING ANSWER
ANS

        CALL EXTEND FOR BUSY, RING OR CALL STATE
CEBC

        NETWORK-WIDE AUTOMATIC CALLBACK ON BUSY
CBBN

        DON'T RELEASE CALL TO BUSY HUNT GROUP
BSHT

        END-OF-DIAL FOR BLOCK IS SET
BLOC

        SEND NO NODE NUMBER TO PARTNER
LWNC

        INCOMING CIRCUIT FROM SYSTEM WITHOUT LCR
NLCR

        TSC-SIGNALING FOR NETWORK-WIDE-wide FEATURES
 (MANDATORY)
TSCS

        USE DEFAULT NODE NUMBER OF LINE
DFNN
```

```
        INCOMING CIRCUIT FROM SYSTEM WITHOUT LCR (DATA)
NLRD

        NO FLAG TRACE
NOFT

        NO TONE
NTON


    COT:   5  INFO: 21: S0/2 AMT EDSBRD M. ABWURF
   DEVICE: S2COD        SOURCE: HD
   PARAMETER:
        RECALL IF USER HANGS UP IN CONSULTATION CALL
RCL

        ATTENDANT INTERCEPT WHEN DIALING INCOMPLETE
IIDL

        ATTENDANT INTERCEPT WHEN VACANT
IVAC

        ATTENDANT INTERCEPT WHEN BUSY
IBSY

        ATTENDANT INTERCEPT WHEN UNAUTHORIZED
INAU

        ATTENDANT INTERCEPT WHEN ALL TRUNKS BUSY
 (CONGESTION)
ITB

        ATTENDANT INTERCEPT WHEN DO-NOT-DISTURB IS
 ACTIVATED
IDND

        ATTENDANT INTERCEPT WHEN FREE (AFTER TIMEOUT)
IFR

        TRUNK SIGNALING ANSWER
ANS
```

```
        CALL EXTEND FOR BUSY, RING OR CALL STATE

CEBC

        NETWORK-WIDE AUTOMATIC CALLBACK ON BUSY

CBBN

        INTERCEPT WHEN DISALLOWED NUMBER

IDIS

        DON'T RELEASE CALL TO BUSY HUNT GROUP

BSHT

        END-OF-DIAL FOR BLOCK IS SET

BLOC

        SEND NO NODE NUMBER TO PARTNER

LWNC

        CALL INTERCEPT IF NO DIGITS DIALED

INDG

        INCOMING CIRCUIT FROM SYSTEM WITHOUT LCR

NLCR

        TSC-SIGNALING FOR NETWORK-WIDE FEATURES (MANDATORY)

TSCS

        USE DEFAULT NODE NUMBER OF LINE

DFNN

        INCOMING CIRCUIT FROM SYSTEM WITHOUT LCR (DATA)

NLRD

        NO FLAG TRACE

NOFT

        NO TONE

NTON

    COT:   6  INFO: LEER / NOT USED

   DEVICE: INDEP        SOURCE: HD
```

```
   PARAMETER:

        NO TONE

NTON
```

and so on.

15.1.3 Variant table and value in the database for COP

With DISPLAY-COP:VARNO=<number>; the variant table is output as well as which COP number on the hard-disk will be copied to which COP number in the database.

The following is a short example:

```
DISP-COP:VARNO=1&&6;

H500:  AMO COP   STARTED


    VARNO:   1     GERMANY

   COPNO  HD  ->  COPNO  DB

   ------------------------

     1        ->   10

     2        ->   11

     3        ->   12

     4        ->   20

     5        ->   21

     6        ->   22

     7        ->   23

     8        ->   30

     9        ->   31

    10        ->   32

    11        ->   33

    12        ->   34

    13        ->   35
```

```
 14         ->   36

 15         ->   40

 16         ->   50

 17         ->   51

 18         ->   70

 19         ->   71

 20         ->   80

 21         ->   90

 VARNO:   2     AUSTRIA

COPNO  HD  ->  COPNO  DB

------------------------

 22         ->   10

 23         ->   11

 24         ->   20

 25         ->   21

 26         ->   30

 27         ->   31

 28         ->   32

 29         ->   33

 30         ->   34

 31         ->   35

 32         ->   36

 33         ->   40

 34         ->   50

 35         ->   51

 36         ->   70

 37         ->   71

 38         ->   80
```

```
 39        ->   90

 VARNO:   3     CZECH REPUBLIC (CRE)
COPNO  HD  ->  COPNO  DB
------------------------
 40        ->   10
 41        ->   20
 42        ->   30
 43        ->  110

 VARNO:   4     ESTONIA (EST)
COPNO  HD  ->  COPNO  DB
------------------------
 44        ->  110

 VARNO:   5     DENMARK (DAN)
COPNO  HD  ->  COPNO  DB
------------------------
 45        ->  100
 46        ->  110
 47        ->  112
 48        ->  225

 VARNO:   6     FINNLAND (FIN)
COPNO  HD  ->  COPNO  DB
------------------------
 49        ->   55
 50        ->  110
```

15.1.4 Variant table and value in the database for COT

With DISPLAY-COT:VARNO=<number>; the variant table is output as well as which COT number on the hard-disk will be copied to which COT number in the database.

The following is a short example:

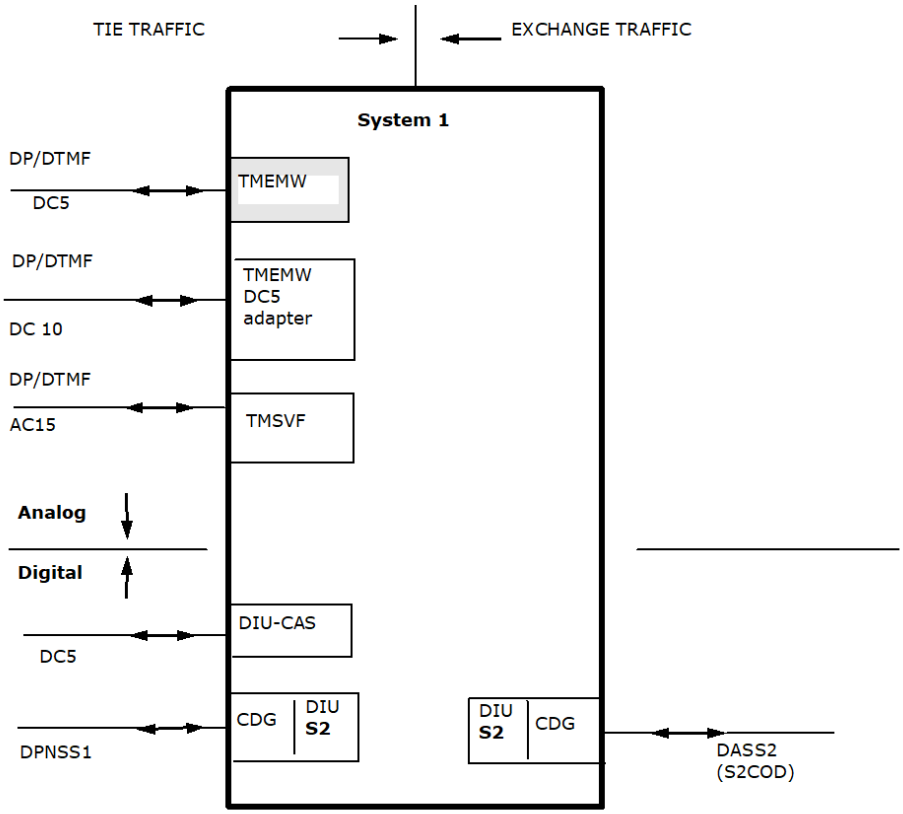
```
DISP-COT:VARNO=1&&6;

H500:  AMO COT   STARTED


    VARNO:   1     GERMANY

   COTNO  HD  ->  COTNO  DB

   ------------------------

     1        ->   10

     2        ->   11

     3        ->   12

     4        ->   20

     5        ->   21

     8        ->   30

     9        ->   31

    11        ->   33

    12        ->   34

    13        ->   35

    14        ->   36

    10        ->   38

   163        ->   40

   164        ->   41

    15        ->   42

   165        ->   43

    16        ->   50

    17        ->   51

    18        ->   70
```

```
 19         ->   71

166         ->   72

 20         ->   80

 21         ->   90

 VARNO:   2     AUSTRIA

COTNO  HD  ->  COTNO  DB

------------------------

 22         ->   10

 23         ->   11

 24         ->   20

 25         ->   21

 26         ->   30

 27         ->   31

 28         ->   32

 29         ->   33

 30         ->   34

 31         ->   35

 32         ->   36

 33         ->   40

 34         ->   50

 35         ->   51

 36         ->   70

 37         ->   71

 38         ->   80

 39         ->   90

 VARNO:   3     CZECH REPUBLIC (CRE)

COTNO  HD  ->  COTNO  DB
```

```
------------------------

 40         ->   10

 41         ->   20

 42         ->   30

 43         ->  110

 VARNO:   4     ESTONIA (EST)

COTNO  HD  ->  COTNO  DB

------------------------

 44         ->  110

 VARNO:   5     DENMARK (DAN)

COTNO  HD  ->  COTNO  DB

------------------------

 45         ->  100

 46         ->  110

 47         ->  112

 48         ->  225

 VARNO:   6     FINNLAND (FIN)

COTNO  HD  ->  COTNO  DB

------------------------

 49         ->   55

 50         ->  110
```

15.2 Parameter Generation and Signaling for International Markets

15.2.1 Exchange Traffic and Tie Traffic for UK

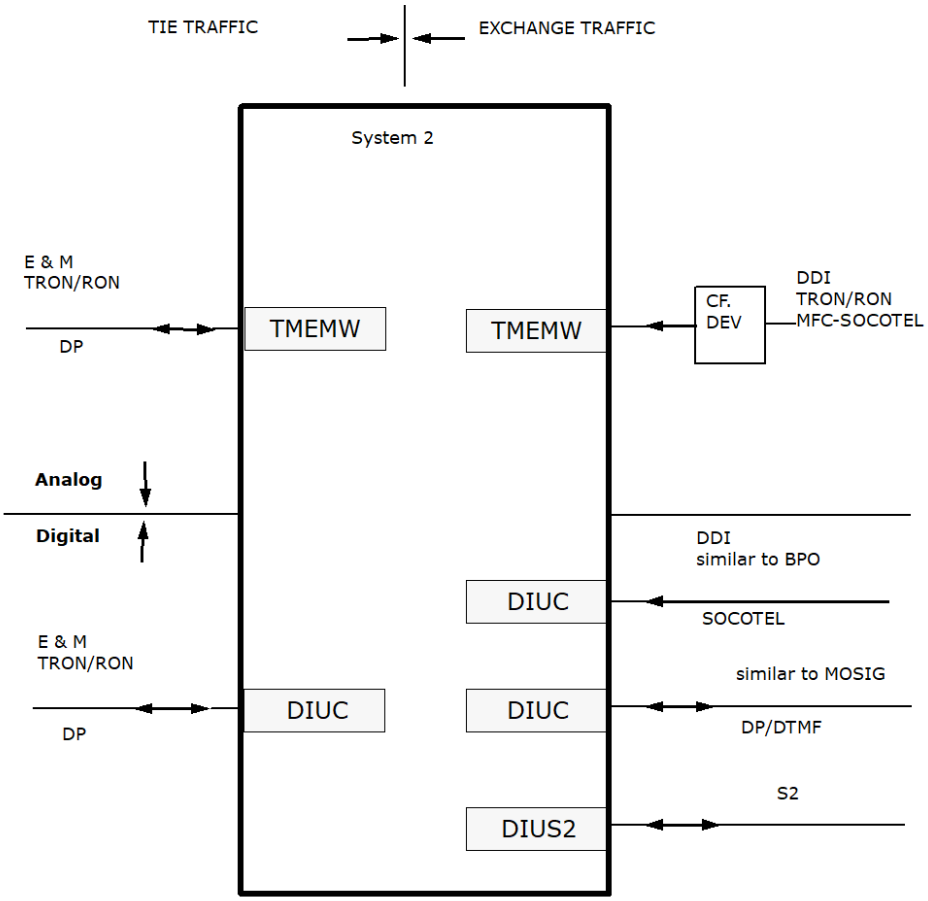


15.2.2 Parameter Overview for UK

Board	COP Parameters	COT Parameters	Operating Mode/Criteria
TMEDG	DTMF,RLSA PDP1	RCL,CHRT LTMG, CEOC NTON	EARTH CALLING ASEC GROUND START
	DTMF,RLSA PDP1	RCL,CHRT LTMG, CEOC NTON	LOOP CALLING, ASDCL DISCONNECT CLEARING
	DTMF,RLSA PDP1	RCL,CHRT LTMG, ANS NTON	LOOP CALLING, ASGCL GUARDED CLEARING
TMEMW	ANS, RLSA BR64, PDP1 IDP1	ANS, CHRT CEOC, NTON	DC5 / DC 10

Board	COP Parameters	COT Parameters	Operating Mode/Criteria
TMSVF	ANS, SFRM BR64, PDP1 IDP1	RCL, ANS CHRT, CEOC NTON	AC 15
DIUS2	---	XFER, ANS CHRT, KNOR CEBC, TIE CBBN, FWDN RCLS, NTON	Layer 2 protocol (LAP D) P-P with K=7
DIU-CAS	DTMF, ANS SFRM,DTM1, PDP1	IBSY, ANS, CHRT, CEOC	DC 5

15.2.3 Exchange Traffic and Tie Traffic for France



15.2.4 Parameter Overview for France

Board	COP Parameters	COT Parameters	Operating Mode/Criteria
TMEMW		NTON,	CF signaling on TRON/ RON, MFC - SOCOTEL
DIUS2		XFER, ANS, CHRT, KNOR, CEBC, TIE, CBBN, FWDN, RCLS, NTON	Layer 2 protocol (LAP D) P-P with K=7
DIU-CAS			

The table contains only basic installation parameters.

You may set additional useful COP or COP parameters.

16 COP Parameter

16.1 Organization of COP parameters

General parameters
• ACKB, ACKF, (BTOF), SACK, COCN, DITW, CTGF, RBLK, FDGT, NTON, IMEX, BR64, NOAN, (NONA), (NOTO), (LKNQ), TRAC, LSUP, L3AR, ANS, EMOV, ANNC, WOT2, NO1A, PDP1, PDP2, PDP3, PDP4, RLSB, RLSA, (RMSG), (RRST), SFRM, TIM1, TIM2, TIM3, TIM4, SDL, RCLA, EODA, EOD, RGSZ, DTT, DTN, DTBR, (DTV), TDED, IDP1, IDP2, IDP3, IDP4;
Parameters for test purposes and approvals
• APPR, ASNM;
Announcements
• AANT;
MFC
• ABPD
DTMF
• DTM1, DTM2, DTM3, DTM4
Special parameters, Exceptions
• EO10, NSDL, TIE, SEDL, (PNIO);
CCE
• CCR, CCM, CCTN;
MLPP
• PDIG, PRMT, RDIG
Associated parameters
• DTMF and one of DTM1/2/3/4 • SDL and one of TIM1/2/3/4 • EODA only works if EOD is set (unilateral dependency!)
Mutually exclusive parameters
• ANNC - DTN
Parameters that must be set
• PDP1 or one of PDP2/3/4 with analog trunks • SPTR up to and including EV1.0 with digital trunks • IDP1 or one of IDP2/3/4 with analog trunks

Country-specific parameters	
Italy	ILRW
Poland	BTN1, BTN2, BTN3, NBAR;
Spain	LSRB
China	COEI, ICAC, LWCC
CIS	ANIC, ANIW, ANIO, AST1, AST2; IVSN, NOCH, LAO0, LAO3, LAI8, LSO0, LSO3 LSI0, LSI3, DT1A, DT2A, RF0C, RF1C, RF2C, RF3C;
USA	ALUL, NAAT,

16.1.1 COP parameter description

Par.	Description	HiPath 4000 V6	Note
AANT	With this parameter "synchronized" announcements can be handled like "asynchronous" announcements. The application is for second announcements with music which are injected immediately. With this parameter, the device handler controls the TMOM to activate the announcement device immediately. The COT parameter ANOD is essential. (In this case, the announcement device is connected to a/b, the c/d wires on the TMOM must be jumpered.)	x	
ABAN	Line with answer before synchronized announcement is injected (for incoming seizure).	x	
ABPD	Line with answer before postdial	x	
ACKB	Backward release acknowledgment	x	
ACKF	Forward release acknowledgment	x	
ALUL	Accept a-law in bearer-capability, that is, convert to y-law	x	USA
ANIC	Line with ANI Codogram (transmission with incoming seizure, see COT value ANIC), CIS	x	CIS
ANIO	ANI without tone, CIS	x	CIS

Par.	Description	HiPath 4000 V6	Note
ANIW	ANI with tone, CIS	x	CIS
ANNC	With incoming seizure in analog tie traffic, a local announcement (SIU tone, AMO ZAND) instead of a dial tone is injected. The DTN parameter must not be set!	x	
ANS	This parameter is for lines supporting the signalling method "Answering".	x	
APPR	Set only for test purposes and approvals	x	
ASEG	APDU segmentation not allowed (CorNet-NQ) As the default for OpenScape 4000, APDUs that are too long and do not fit in an ECMA/ ISO standardized Facility Information Element, will be segmented (CorNet-NQ Issue V2.2 APDU SEGMENTATION). Parameter must be set for all CorNet-NQ protocol versions, HV1.0 IM and later, if you do not want APDU segmentation.	x	
ASNM	Display ASN.1 error messages (QSIG) This parameter is used for error diagnosis!	x	
AST1	ANI supervision timer 1 if ANI without tone, (for route1/ trunk1) When the OpenScape 4000 is installed in CIS countries, the CO might request the A station's number for outgoing calls. If the AST1 parameter is set this request is accepted within a time span of 1-60 sec. The A station's number is then transmitted to the CO. See also parameter DT1A.	x	CIS
AST2	ANI supervision timer 2 if ANI without tone, (for route2/ trunk2) When the OpenScape 4000 is installed in CIS countries, the CO might request the A station's number for outgoing calls. If the AST2 parameter is set this request is accepted within a time span of 1-60 sec. The A station's number is then transmitted to the CO. See also parameter DT2A.	x	CIS

Par.	Description	HiPath 4000 V6	Note
BR64	With DP, the pulse series are transmitted with a make/break ratio of 60/40 ms according to the TKO. If the parameter is not set, so-called speed dialing (for example, 30/30 ratio) is used for transmission.	x	
BTN1	Busy tone timeout 1 for incoming calls, for times with DTIM2, TYPEDH=GEN, BTN1, see also NBAR (for example, Poland)	x	Poland
BTN2	Busy tone timeout 2 for incoming calls, for times with DTIM2, TYPEDH=GEN, BTN2, see also NBAR (for example, Poland)	x	Poland
BTN3	Timeout for busy status for incoming calls. (times with DTIM2, TYPEDH=GEN, BTN3) Calls to busy stations go to retesting within this time (only applies if COT: CWBS is set). After timeout the connections are released backwards. During this time the remote CO can override, provided the station's relevant COS allows this. Calls with other negative results are immediately released backwards.	x	Italy
BTOF	Busy tone in response to "CO offering" instead of attendant intercept (exact renunciation tone request). Applies to terminating (incoming) seizure.	x	
CCM	CCS voice connection directly using meet me is possible	x	
CCR	Release with CCS comfort after every task	x	
CCTN	With CCE and CCM: wait for an audible tone after the A block has been transmitted.	x	
COCN	CO consultation call possible.	x	

Par.	Description	HiPath 4000 V6	Note
COEI	Determines whether the IAM/SAM message must evaluate the "Class-Index" (for example, China) With MFC-R2 signalling, COE is transmitted in transit cases.	x	China
COTT	CO tone in transit traffic for CO trunks	x	
CTGF	Continuous tone in the event of group failure TL-CF. For analog tie traffic with CF signalling in remote incoming blocking state or resp. line alarm, the continuous tone in the event of group failure of the integrated carrier frequency device is processed accordingly.	x	
DITW	Incoming MSI seizure leads to a defined destination. If DITW is set, the digit information from the DGTPR memory (parameter DGTPR in the AMO TACSU) is transmitted to the digit analysis for incoming seizure. This results in automatic connection setup to the predefined station.	x	
DT1A	ANI delay timer 1 used with ANI procedures without tone (for direction 1/ trunk1), CIS If the A station number requested by the CO was transmitted in a codogram, this timer is used to delete the request. See also AST1.	x	CIS
DT2A	ANI delay timer 2 used with ANI procedures without tone (for direction 2/ trunk2) CIS If the A station number requested by the CO was transmitted in a codogram, this timer is used to delete the request. See also AST2.	x	CIS

Par.	Description	HiPath 4000 V6	Note
DTBR	Line with renewed dialtone instead of backward releasing (only with DP!). This parameter must be set, if the B station goes on hook and the A station wants to call a further station in the B system. The line is not released. Dialtone is injected in the B system to signal ready-to-dial condition.	x	
DTM1	Make/break ratio for DTMF dialing, variant 1 (80/80 ms). The DTMF parameter must be set.	x	
DTM2	Make/break ratio for DTMF dialing, variant 2 (150/150 ms) The DTMF parameter must be set.	x	
DTM3	Make/break ratio for DTMF dialing, variant 3 (200/200 ms) The DTMF parameter must be set.	x	
DTM4	Make/break ratio for DTMF dialing, variant 4 (300/300 ms) The DTMF parameter must be set.	x	
DTMF	Line with DTMF dialing (one of the DTM1-4 parameters must be set).	x	
DTN	With incoming seizure the dialtone is injected according to the COT setting (NTON, DTNI, DTNE, ANNC)	x	
DTT	Dialtone instead of start-dialing signal. With outgoing traffic the dialtone is evaluated using dialtone receivers. Then the digits are transmitted.	x	
DTV	Line with multiple dialtones	x	
EMOV	This parameter must be set to allow emergency override/disconnect for incoming analog tie trunks.	x	
EO10	Emergency override via analog tie trunks with E&M or CF signalling with 10 instead of 11 pulses. (Interworking for example, with EMS601)	x	

Par.	Description	HiPath 4000 V6	Note
EOD	This parameter is for lines supporting the "End-of-dialing" signalling method. End-of-dialing is transmitted if 'dialing complete' was recognized. With analog tie traffic this signal has no meaning (for example, STN free/busy)	x	
EODA	End-of-dialing analyzed (interworking with GTD systems) This parameter must be set, if weighted end-of-dialing (free/busy) is to be evaluated with analog tie traffic using CF signalling and a GTD system as partner node. With "End-of-dialing busy" from the remote system manual override on the busy station and retesting can be registered. Attention: the COP parameter EOD must be set.	x	
FDGT	Line is switched through immediately, no digits are sent.	x	
ICAC	Acknowledge first digit with line signals (MFP2), China. With MFP2 signalling and this parameter set, the first received digit is acknowledged with the appropriate line signal. This is required for the control of the line signal INITIAL_CODE_ACKNOWLEDGE in the Chinese signalling variant DIUC32/64 for the MFP2 signalling method.	x	China
IDP1	Interdigit pause 1, that is, the pause between the pulse dialing series. One of the parameters IDP1-4 must be specified (associated time, parameter IDGT1 in AMO DTIM2).	x	
IDP2	Interdigit pause 2, that is, the pause between the pulse dialing series. One of the parameters IDP1-4 must be specified (associated time, parameter IDGT2 in AMO DTIM2).	x	

Par.	Description	HiPath 4000 V6	Note
IDP3	Interdigit pause 3, that is, the pause between the pulse dialing series. One of the parameters IDP1-4 must be specified (associated time, parameter IDGT3 in AMO DTIM2).	x	
IDP4	Interdigit pause 4, that is, the pause between the pulse dialing series. One of the parameters IDP1-4 must be specified (associated time, parameter IDGT4 in AMO DTIM2).	x	
ILRW	Italian Railway	x	Italy
IMEX	Conversion of implicit to explicit number with DSS1. If the OpenScape 4000 is used as DSS1 trunk and the "TYPE OF NUMBER" = "UNKNOWN" for incoming seizure, the transmitted prefixes of the B number are deleted. The prefixes set with AMO TDCSU are used for this purpose. If this parameter is not set, the "TYPE OF NUMBER" = "SUBSCRIBER" must be set.	x	
IVSN	Adjustment of the OpenScape 4000 interface on IVSN (CIS)	x	CIS
L3AR	Registration of the ISDN layer 3 advisory messages. If this parameter is set, layer 3 error messages are output on the operating terminal in case of protocol violations. This parameter only applies for ISDN circuits.	x	
LA03	Level ANI outgoing -3.5 dB0 (alternative to LAO0, default value -7 dB0) CIS	x	CIS
LAI8	Level ANI incoming -0.8 dB0 (default value -4.3 dB0) CIS	x	CIS
LAO0	Level ANI outgoing 0 dB0 (alternative to LAO3, default value -7dB0) CIS	x	CIS
LCOS	Limitation of the LCOS index to 32	x	LCR

Par.	Description	HiPath 4000 V6	Note
LKNQ	This parameter is set if the partner PBX is a OpenScape 4000 and the networking protocol Cornet-NQ/Qsig is used. This parameter must not be set, if the partner PBX is a remote system.	x	
LSI0	Level MFR-Shuttle incoming 0 dB0 (alternative to LSI3, default value -7 dB0) CIS	x	CIS
LSI3	Level MFR-Shuttle incoming 3.5 dB0 (alternative to LSI0, default value -7 dB0) CIS	x	CIS
LSO0	Level MFR-Shuttle outgoing 0 dB0 (alternative to LSO3, default value -7 dB0) CIS	x	CIS
LSO3	Level MFR-Shuttle outgoing -3.5 dB0 (alternative to LSO0, default value -7 dB0) CIS	x	CIS
LSRB	Line supervision for analog tie traffic with E&M signalling with remote blocking. If the seizure acknowledgment is missing a remote blocking signal is transmitted (Spain).	x	Spain
LSUP	Line with line supervision. If this parameter is set the line is supervised. This parameter only applies for analog trunks with line supervision. The reseizure lockout is implemented on the board (LW) (release to the line is always acknowledged): a) For lines with supervision for line interruptions in idle state b) For lines with supervision for line interruptions in the state "Waiting for receipt of seizure acknowledgment" or "Start-dialing signal" (with E&M only)	x	
LWCC	Line with continuity check in case of seizure (CSN7, China)	x	China
MCHI	Channel ID can be repeated in the restart message	x	
NAAT	North American Analog Trunk	x	USA

Par.	Description	HiPath 4000 V6	Note
NBAR	No busy tone on the line after release (for example, Poland) See BTN1/2/3 for busy tone.	x	
NO1A	No 1A signalling method. With lines without end-of-dialing, the end-of-dial detection is deactivated using signalling method 1A.	x	
NOAN	No answer on receipt of first charge pulse. If the parameter is not set, the reception of a charge pulse equals answering. This applies only for signalling methods without answer (analog).	x	
NOCH	Line without charge (CIS). If this parameter is set, the device handler transmits the classes of service COSSU and NOCHRG to the LW. The corresponding E&M circuit must be configured with "Answering". If this parameter is not set or if NCOHRG is not set in the AMO COSSU, no corresponding message is sent to the LW.	x	CIS
NONA	Send no name. If this parameter is set, the OpenScape 4000 does not transmit names and ignores received names. This parameter is only relevant for the Swissnet 3 protocol, Swissnet 3 allows the transmission of names as UINFO information elements.	x	
NOTO	No tone between end-of-dialing and answer.	x	
NOTR	No transparency mode between ECMA and ISO Qsig	x	
NSDL	Auxiliary parameter for AMO COP. It allows the setting of TIM1/2 on its own without the SDL parameter which will otherwise be automatically set.	x	

Par.	Description	HiPath 4000 V6	Note
NTON	Identification of a pulsed tone as dialing tone. Applies to trunk and tie lines. Must be set, if the first tone to be evaluated is a pulsed dialing tone. (Default continuous tone)	x	
PDIG	The first digit is treated as an MLPP precedence digit	x	MLPP
PDP1	Pause before first dial string, only with analog lines. At least one of the parameters PDP 1/2/3/4 must be set (for time, see AMO DTIM2, PDLY1).	x	
PDP2	Pause before first dial string, only with analog lines. At least one of the parameters PDP 1/2/3/4 must be set (for time, see AMO DTIM2, PDLY2).	x	
PDP3	Pause before first dial string, only with analog lines. At least one of the parameters PDP 1/2/3/4 must be set (for time, see AMO DTIM2, PDLY3).	x	
PDP4	Pause before first dial string, only with analog lines. At least one of the parameters PDP 1/2/3/4 must be set (for time, see AMO DTIM2, PDLY4).	x	
PNIO	This parameter allows activation of controlled disconnect, for example, with E&M priorities, on analog tie lines.	x	
PRMT	Line with preemption signaling	x	MLPP
R176	Digital device is configured for API	x	
RBLK	Line with remote blocking. If the circuit is blocked either manually or by soft restart, a blocking signal is transmitted to the partner system.	x	
RCLA	Timed recall to AC. If after an incoming seizure the backward release is not acknowledged, a timed recall is carried out. (Or: if the external A station waits after the internal B station has released, the A station is signaled at the AC.) Timer: DTIM1, TYPEDH=MFCDID, RBANSW=xx	x	

Par.	Description	HiPath 4000 V6	Note
RDIG	The first/second digit is treated as an MLPP RouteCodeDigit	x	MLPP
RF0C	Repeat factor 0 for ANI-codogram, CIS The transmitted codogram is not repeated.	x	
RF1C	Repeat factor 1 for ANI-codogram, CIS The transmitted codogram is repeated once.	x	
RF2C	Repeat factor 2 for ANI-codogram, CIS The transmitted codogram is repeated twice.	x	
RF3C	Repeat factor 3 for ANI-codogram, CIS The transmitted codogram is repeated three times.	x	
RGSZ	Dialing after register seizure This parameter applies for analog lines with two seizure types ("Directional seizure"). The parameter must be set in the A system if the second seizure type is used and the destination to be seized is transmitted from the A system via the line. If the destination address for the "directional seizure" is stored as fixed presetting in the remote system, the parameter must not be set.	x	
RLSA	This parameter is for lines supporting "Backward release after release".	x	
RLSB	This parameter is for lines supporting "Backward release when busy".	x	
RMSG	If this parameter is set, a RESTART message is sent to the remote PBX when layer 1 is activated.	x	

Par.	Description	HiPath 4000 V6	Note
RRST	If this parameter is set, the Restart Indicator, which was transmitted in the RESTART message from the remote PBX during RESTART_ACK, is sent back unmodified. This parameter must be set if not all B channels of an S2 line have been configured, for example, for connections to special servers or to T1 trunks via a/u law converters.	x	
SACK	Seizure acknowledgment on the line is transmitted, if the seizure was recognized and accepted. As soon as the acknowledgment is received, either digits can be dialed after a signal interval or the line waits for further signals such as start-dialing or dialing tone.	x	
SDL	The start-dialing signal is transmitted, if the seizure was recognized and the system is ready for dialing. When the start-dialing signal is received, digits can be dialed after a signal interval. Together with SDL, a start-dialing signal time must be set, see parameters TIM. If TIM1/2 is not specified, the AMO automatically sets TIM1	x	
SEDL	This parameter is used to identify circuits for series/supplementary dialing. This parameter is used in power utility company networks and allows the local announcement of the selected node to be heard. This parameter can only be set in association with DP on the line. With outgoing seizure end-of-dialing is activated immediately.	x	
SFRM	Line with special mode. (For a detailed description, see comments in the AMO description after the parameter descriptions.)	x	
SPD	Device handler recognizes speed calling.	x	

Par.	Description	HiPath 4000 V6	Note
SPTR	If this parameter is set, the ISDN service information (BC, HLC, or LC) are routed transparently through the system and are not mapped into the OpenScape 4000 service profiles. BC - Bearer Capability HLC - High Layer Compatibility LLC - Low Layer Compatibility Rule: Always set this parameter up to and including EV1.0. From EV2.0 the meaning of this parameter was reversed, that is, do not set this parameter as standard.	x	
TDED	Line with time dependent CO dialtone to the station.	x	
TIE	If this parameter is set, incoming traffic on MFC lines is processed as tie traffic. Used to configure the trunk circuits BWFIN (R2 Finland) and SOCFR (R2 France) as "tie trunks" (trick solution!).	x	
TIM1	If this parameter is set, the start-dialing signal timer 1 is used for monitoring the start-dialing time on lines using the start-dialing signal (STADIAL1 in the AMO DTIM2).	x	
TIM2	If this parameter is set, the start-dialing signal timer 2 is used for monitoring the start-dialing time on lines using the start-dialing signal (STADIAL1 in the AMO DTIM2).	x	
TIM3	If this parameter is set, the start-dialing signal timer 3 is used for monitoring the start-dialing time on lines using the start-dialing signal (STADIAL1 in the AMO DTIM2).	x	
TIM4	If this parameter is set, the start-dialing signal timer 4 is used for monitoring the start-dialing time on lines using the start-dialing signal (STADIAL1 in the AMO DTIM2).	x	

Par.	Description	HiPath 4000 V6	Note
TRAC	Line with pre-tracing, signalling of emergency disconnect is possible. Only in connection with analog tie lines with E&M or CF signalling and the feature "Emergency override". The neighboring node must also be a OpenScape 4000 system. If a disconnect request has already been signaled, the signal "line traced" (12 pulses) is transmitted to the neighboring node before the destination number is transmitted. Because of this, this node is alerted that in case of "all trunks busy" a circuit of the desired trunk group is to be released immediately.	x	
UU7B	The Display Info in the User Information Element is coded with 7 Bit and an Extension Bit.	x	
WOT2	Only for trunk circuits (DP/MSI) if a "pulsed" dial tone is to be evaluated as further dial tone marker.	x	
ZMFV	Send out a digit at MFV after end of dialing	x	

16.1.2 COP parameter usage for different signaling methods

1) Analog tie traffic

Overview for COP parameters

- For alternating current signaling
- For loop signaling
- For tone frequency signaling
- For E&M signaling

2) Analog external traffic

Overview of COP parameter

- for MOSIG/DP Signaling

16.1.2.1 Overview of COP for Alternating Current

COP	ALTERNATING CURRENT SIGNALING OpenScape 4000 and partner system is a. . . .				
	OpenScape 4000 or EMS, analog with DTM	OpenScape 4000 or EMS, analog with DP	ESK 400E 3000E with DP	ESK, NEHA or EMD/HDW	Transit node with AC/CF
	TSAC	TSAC	TSAC	TSAC	TSAC
DTMF	X				
SACK					
SDL	X	X			
DTT				X	
BR64		X	X	X	X
EOD	X	X	X		
ANS	X	X			
RLSB	X	X			
RLSA	X	X	X		X
ACKF	X	X	X	X	X
RBLK	X	X	X		X
RGSZ					
DTN			X	X	
DTBR					
ANNC					
SEDL					
NTON				X	
DTM1	X				
DTM2/3/4					
PDP1					
PDP2			X		
PDP3/4					

COP	ALTERNATING CURRENT SIGNALING OpenScape 4000 and partner system is a. . . .				
	OpenScape 4000 or EMS, analog with DTM	OpenScape 4000 or EMS, analog with DP	ESK 400E 3000E with DP	ESK, NEHA or EMD/HDW	Transit node with AC/CF
	TSAC	TSAC	TSAC	TSAC	TSAC
TIM1	X	X		X	
TIM2					
IDP1		X			
IDP2			X	X	X
IDP3/4					

16.1.2.2 Overview of COP for loop signaling

COP	LOOP SIGNALING OpenScape 4000 and Partner System is a. . . .						
	OpenSca 4000 or EMS, analog with DTM	OpenSca 4000 or EMS, analog with DP	ESK 400E 3000E with DP	ESK, NEHA or EMD/ HDW	Austria: Partner PBX transmits:		Australia
					Dial tone	No dial tone	
	TSILP	TSILP	TSILP	TSILP	TSIFD	TSIFD	TSAUST
DTMF	X						
SACK							X
SDL	X	X					X
DTT				X	X		
BR64		X	X	X	X	X	X
EOD	X	X	X				
ANS	X	X					X
RLSB	X	X			X	X	X
RLSA	X	X	X		X	X	X

COP	LOOP SIGNALING OpenScape 4000 and Partner System is a. . . .						
	OpenSca 4000 or EMS, analog with DTM	OpenSca 4000 or EMS, analog with DP	ESK 400E 3000E with DP	ESK, NEHA or EMD/ HDW	Austria: Partner PBX transmits:		Australia
					Dial tone	No dial tone	
	TSILP	TSILP	TSILP	TSILP	TSIFD	TSIFD	TSAUST
ACKF							X
LSUP	X	X	X	X			
RBLK							X
DTN				X	X		
DTBR							
ANNC							
SEDL							
NTON				X	X		
DTM1	X						
DTM2/3/4							
PDP1							
PDP2			X			X	
PDP3/4							
TIM1	X	X		X	X		X
TIM2							
IDP1		X					
IDP2			X	X	X	X	X
IDP3/4							

16.1.2.3 Overview of COP for Tone Frequency Signaling

COP	TONE FREQUENCY SIGNALING OpenScape 4000 and partner system is a. . . .					
	OpenScape 4000 or EMS, analog with DTM	OpenScape 4000 or EMS, analog with DP	ESK 400E 3000E with DP	ESK, NEHA or EMD/ HDW	Partner PBX transmits dial tone instead of start dial	Transit node with AC/CF
	TSC	TSC	TSC	TSC	TSC	TSC
DTMF	X					
SACK	X	X	X		X	
SDL	X	X				
DTT					X	
BR64			X	X	X	X
EOD	X	X	X			
ANS	X	X				
RLSB	X	X	X	X	X	X
RLSA	X	X	X	X	X	X
ACKF	X	X	X	X	X	X
ACKB	X	X	X	X	X	
RBLK	X	X	X			
RGSZ				X	X	
DTN						
DTBR						
SFRM						X
ANNC						
SEDL						
TRAC						
EO10						
EODA						
NTON					X	

COP	TONE FREQUENCY SIGNALING OpenScape 4000 and partner system is a. . . .					
	OpenScap 4000 or EMS, analog with DTM	OpenScap 4000 or EMS, analog with DP	ESK 400E 3000E with DP	ESK, NEHA or EMD/ HDW	Partner PBX transmits dial tone instead of start dial	Transit node with AC/CF
	TSC	TSC	TSC	TSC	TSC	TSC
DTM1	X					
DTM2/3/4						
PDP1						
PDP2			X	X	X	
PDP3/4						
TIM1	X	X	X	X	X	
TIM2						
IDP1		X				
IDP2			X	X	X	
IDP3/4						

16.1.2.4 Overview of COP for E & M Signaling

1) EMS, analog, and American Standard

COP	E & M SIGNALING OpenScape 4000 and partner system or line signaling method is...				
	OpenScape 4000, EMS, analog with DTM	OpenScape 4000, EMS, analog with DP	AMERICAN STANDARD		
			Immediate dial	Delay dial	Wink start
	TSEMU	TSEMU	TSEMUSI	TSEMUSD	TSEMUSW
DTMF	X				
SACK	X	X		X	X
SDL	X	X		X	X
DTT					

COP	E & M SIGNALING OpenScape 4000 and partner system or line signaling method is...				
	OpenScape 4000, EMS, analog with DTM	OpenScape 4000, EMS, analog with DP	AMERICAN STANDARD		
			Immediate dial	Delay dial	Wink start
	TSEMU	TSEMU	TSEMUSI	TSEMUSD	TSEMUSW
BR64			X	X	X
EOD	X	X			
ANS	X	X	X	X	X
RLSB	X	X			
RLSA	X	X			
LSUP	X	X			
RBLK	X	X			
DTN					
DTBR					
SFRM			X	X	X
ANNC					
SEDL					
TRAC					
EO10					
LSRB					
NTON					
DTM1	X				
DTM2/3/4					
PDP1					
PDP2			X		
PDP3/4					
TIM1	X	X		X	X
TIM2					
IDP1		X			

COP	E & M SIGNALING OpenScape 4000 and partner system or line signaling method is...				
	OpenScape 4000, EMS, analog with DTM	OpenScape 4000, EMS, analog with DP	AMERICAN STANDARD		
			Immediate dial	Delay dial	Wink start
	TSEMU	TSEMU	TSEMUSI	TSEMUSD	TSEMUSW
IDP2			X	X	X
IDP3/4					

1) GBR/UK, Cept, power utility companies, loops, and converters

COP	E & M SIGNALING OpenScape 4000 and partner system or line signaling method is...							
	GBR/UK DC 5/AC 15				CEPT System L1		EVU	Loops and Converters
	Delay dial		Immediate					
	DTM	DP	DTM	DP	DTM	DP		
	TSEMD		TSEMI		TSEML1		TSEMUSI	TSEML
DTMF	X		X		X			
SACK							X	X[22]
SDL	X	X			X	X		X*
DTT								
BR64		X		X		X	X	
EOD	X	X						X
ANS	X	X	X	X	X	X		X
RLSB					X	X	X	
RLSA	X	X	X	X	X	X	X	
LSUP								
RBLK							X	
DTN								
DTBR								
SFRM	X	X	X	X				X

22 Only one seizure acknowledgement or line with start-dial signal can be set.

COP	E & M SIGNALING OpenScape 4000 and partner system or line signaling method is...							
	GBR/UK DC 5/AC 15				CEPT System L1		EVU	Loops and Converters
	Delay dial		Immediate					
	DTM	DP	DTM	DP	DTM	DP		
	TSEMD		TSEMI		TSEML1		TSEMUSI	TSEML
ANNC								
SEDL							X	
TRAC								
EO10								
LSRB								
NTON								
DTM1	X		X		X			
DTM2/3/4								
PDP1	X	X	X	X	X	X		
PDP2							X	X
PDP3/4								
TIM1	X	X		X	X	X		X
TIM2								
IDP1								
IDP2		X		X		X	X	X
IDP3/4								

16.1.2.5 Overview of COP for MOSIG/DP Signaling

COP	MOSIG/DP SIGNALING OpenScape 4000 and partner system is a...							
	PSTN with DP	RF Xmittr w/o dialg.	PSTN[23]	Private netw[24]	Private netw[25]	PSTN with DP	DU=WA 66-GDR with DP	Interntl. with DTM
	MOSIG	MOSIG	MOSIG	MOSIG	MOSIG	DP	DP	DP
DTMF				X				X
SDL	X				X	X	X	X
BR64	X	X			X[26]	X	X	
FDGT		X						
DITW			X					
LSUP					X		X	
TDED					X			
DTV				X				
SFRM			X					
NTON					X			
WOT2				X				
TIM1								
TIM2				X				
DTM1				X				X
DTM2/3/4								
PDP3				X				X
TIM1							X	
TIM2	X				X	X		
IDP1								

23 PSTN, incoming traffic only. Calls to a pre-defined destination are re-routed to the attendant if the line is busy.

24 For outgoing traffic, the line is dialed with DTMF dialing, and an additional dial tone marker is evaluated.

25 Simple tie-traffic with exchange line grounding (for call transfer after consultation hold).

26 Prefixed digits, for max. 6 digits for pre-defined destination number.

COP	MOSIG/DP SIGNALING OpenScape 4000 and partner system is a...							
	PSTN with DP	RF Xmittr w/o dialg.	PSTN[23]	Private netw[24]	Private netw[25]	PSTN with DP	DU=WA 66-GDR with DP	Interntl. with DTM
	MOSIG	MOSIG	MOSIG	MOSIG	MOSIG	DP	DP	DP
IDP2	X	X			X	X	X	
IDP3/4								

IMPORTANT: DTMF dialing signals are not processed in incoming traffic.

If the TMBD board is used, DTMF dialling or DP is possible. Line signal key is

- "Ground" key for DP,
- or "FLASH" key for DTMF

IMPORTANT: You must set the dialing method before putting the board into service.

16.1.3 Configurations for foreign countries

refer to Chapter 176, "Parameter Generation and Signaling for International Markets".

16.2 ALUL - A- to Mu- Law Convertor

Feature:

a-law/u-law and u-law/a-lawConverter in the D-Channel (SETUP).

Function:

A US-Switch is working with u-law and a IM-Switch is working with a-law. If this two switches are connected together by using an a-law/u-law Converter (internal or external) the B-Channel will be translated but the coding in the D-Channel (SETUP) is still wrong. Therefore whenever a Switch is working in u-law and the new COP Parameter is set, it will accept a SETUP with a-law and change it to u-law and vice versa. Otherwise the SETUP will be rejected.

23 PSTN, incoming traffic only. Calls to a pre-defined destination are re-routed to the attendant if the line is busy.

24 For outgoing traffic, the line is dialed with DTMF dialing, and an additional dial tone marker is evaluated.

25 Simple tie-traffic with exchange line grounding (for call transfer after consultation hold).

Parameter set (u-law-Switch): Accept a SETUP with a-law in bearer-capability IE and change it to u-law. Outgoing SETUP with u-law in BC IE will be changed to a-law.

Parameter not set (u-law-Switch): An incomming SETUP with a-law in the Bearer-Capability IE would be rejected.

Parameter set (a-law-Switch): Accept a SETUP with u-law in bearer-capability IE and change it to a-law. Outgoing SETUP with a-law in BC IE will be changed to u-law.

Parameter not set (a-law-Switch): An incomming SETUP with u-law in the Bearer-Capability IE would be rejected.

Hints: Effect bothway for services speech and 3.1 kHz audio.

In a u-law Switch the new AMO-COP Parameter has be set on Digital Trunks leading to an Switch working with a-law and vice versa.

AMO-Interrelationships:

Device type:

digital trunk

Protocol variants:

Applies to all protocols

16.3 COTT - CO-Tone in Transit Traffic

Feature:

To hear external tone in transit traffic with DIP or DTMF and device type TC.

Function:

Parameter set : Hearing of external tone in transit traffic with DIP or DTMF and device type TC is possible..

Parameter not set): External tone in transit traffic with DIP or DTMF and device type TC is not audible.

Hint:

Effect bothway.

AMO-Interrelationships:

None

Device type:

Device Type TC

Protocol variants:

Applies to all protocols

16.4 NAAT - North America Analog Trunks

Feature:

Different use of Trunks with the same CP and DH between US-Trunks and European-Trunks in order to handle them correct.

Function:

Parameter set : Release is like US type.

Parameter not set): Release is like Rest of World.

Hint:

Effect both way.

AMO-Interrelationships:

None

Device type:

TMEMUS,TMDID,TMC16,TMDN64

Protocol variants:

PLAR, HOOT & HOLLER,E & M Protocol

17 COT Parameter

17.1 Organization of COT parameters

General parameters
• RCL, KNDI, KNEX, KNOR, COTN, DIUD, TCET, SDID, NOVC, NLHT, NORR, NRBA, NRAA, DSDL, NTON, RCLS, LINC, LINO, LWNC, TRAI, AEOD, MRCA, ANS, ABPD, (PDOT), ANNC, NLRD, PNEV, TIE, T4WA, BRAR, ROPT, CBBN, CBFN, FNAN, BSHT, SATC, VCMN, SPCM, TNDV, ATRS, CTAL, CEOC, CEBC, TRBA, CHRT, ITRN, DFNN, CPS6, VM
Parameters for test purposes and approvals
• APSM
Synchronous announcements
• APSM, ABNA, ANOD, SANH, SATR, WAAN, RDDI
Normal announcements
• ANNA, ANHT
Call forwarding
• CFOS, FWDN, CFTR, BFSR, CDN, CFBN, LRPM, NPIS, NPPR, NPUN, ORRN, CFVA, FNAN;
Attendant intercept
• IONS, IDND, IBSY, IFR, ITB, INDG, INAU, IDIS, IVAC, IIDL;
Special parameters, Exceptions
• TGRE, CUG, EODL, PROV, EDBA, (PRI), OVRA;
AC parameters
• CECO, RCLS, ACTR, ACRC, NCHG;
Phone mail
• DTMF, FAX1, FAX2, LRPM, SPSR;
Charging
• CDBO, IICB, SNBE, CATR, AOCC, CDRD, IGID, ICZL, ICZO, TRSC, NCHD, PGEP;
MFC parameters
• TIEI, ATDI, MFC, NCHG;
Diagnosis parameters
• CTLS, NOFT, IEVT;

CDG parameters
• XTRC, ITRC;
OpenScape 4000 as DSS1 trunk
• BCCC, BCNE, CCRO, ETSC, NCHD, TR6T, USBT, USCC, USCD, UUS1, UUS3;
DSS1 USER-TO-USER Service
• ETSC, USBT, USCD, US1E, UUS1, USCC;
Voice Compression
• SPCP, VCMN, SPCM;
Hunt Group
• ANHT, HGTR, BSHT;
Call pickup (network-wide)
• NQPI, NQNP, ETSC, UUS1, USCC;
ACDG
• AACD;
MFC-R2
• ETE, ETE1, ETE2, ETE3, ETE4, ETE5, MFC;
MLPP
• FLOV, FLSH, IMDI, MLPR, NIN2, NMLT, PRIC, ROUT
Parameters which cancel each other out
• IBSY and CWBS • ICZL and ICZO • NTON and VM-DTNI-DTNE-ANNC • LINC and LINO • TIE and ITT • RLIN and SECO • CTAL and CONS • CEOC and CEBC
Parameters that must be set
• BLOC with QSIG • AOCC with Cornet N and QSIG • TSCS with digital circuits • NTON or one of the following alternatives, VM, DTNI, DTNE, ANNC
Parameters that are new in OpenScape 4000 V7

• CDURSUPR	
Country-specific parameters	
Italy	AI1/2/3, AI1N/2N/3N, IRTO, DI1/2/3, DI1N/2N/3N;
France	FWDR, TMFC, USD;
China	COEX, CSN7, MAOV;
CIS	ANIC, ASTN, ADIU, MFOB, DTMP, DTMS, MRCA, RCBS, CCTN;
Pakistan	MSIR, LBPR, TCC;
Belgium	MLPR, NMLT
USA	BKNA, DIT, NAAT, NCT, OHKQ, SPAH,

17.1.1 COT Parameter Description

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
AACD	PNSF Call Wait at ACD unknown for orig. node of CAS	x	x	ACDG
ABNA	Synchronized announcement with attendant intercept on busy or no answer.	x	x	
ABPD	Answer before postdial or announcement. If set, an "answer" to the A station is sent before an announcement is started. This enables the A station to hear the announcement.	x	x	
ACH3	Special classmark assignment for an outgoing consultation call by the attendent with a CO party on hold - required trunks to OpenScape Business/HiPath 3000	x	x	
ACRC	AC with reverse charging.	x	x	AC
ACTR	AC with call tracing.	x	x	AC
ADIU	Attenuation of DIUC trunk circuits, CIS.	x	x	CIS

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
AEOD	Line with advanced end-of-dial transmission (e.g. for DP and MOSIG signalling). For transit connections, when this parameter is set, an advanced end-of-dial is sent to the incoming circuit. This parameter is set for critical time conditions!	x	x	
AI1	Announcement of incoming seizure type 1, TSC (Italian Railway)	x	x	Italy
AI1N	Announcement of incoming seizure type 1 and own node no., TSC (Italian Railway)	x	x	Italy
AI2	Announcement of incoming seizure type 2, TSC (Italian Railway)	x	x	Italy
AI2N	Announcement of incoming seizure type 2 and own node no., TSC (Italian Railway)	x	x	Italy
AI3	Announcement of incoming seizure type 3, TSC (Italian Railway)	x	x	Italy
AI3N	Announcement of incoming seizure type 3 and own node no., TSC (Italian Railway)	x	x	Italy
AICF	Attendant intercept, if an already forwarded connection is to be re-routed to a trunk. If this parameter is set, then already forwarded incoming connections which are to be re-routed to a trunk are intercepted by the AC. If the parameter is not set the connections are released. This parameter is only valid for incoming circuits with MFC signalling.	x	x	CFW
AMFC	Automatically DTMF conversion on incoming calls while in talk (**AMFC** will be ignored when AMO SBSCU parameter **TRACE** is set).	x	x	
ANDY	ANI delivery in mixed networks.	x	x	
ANHT	When entering a call in the hunting group call queue an announcement is activated. For use in countries where instead of a free tone, a waiting tone is sent when calls are waiting in the hunting group call queue (i.e. Finland)	x	x	

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
ANIC	Line with ANI Codogramm transmission (see COP value ANIC), CIS	x	x	CIS
ANNA	On attendant intercept, a text announcement is started. The announcement connection is configured using AMO SSC, TYPE=EXTANN, CPCALL=ANNICPT	x	x	
ANNC	Local announcement. For incoming analog connections a local announcement is activated. An alternative is to enter one of the following parameters: NTON, VM, DTNI, DTNE or ANNC. Then the relevant SIU tone will be activated.	x	x	
ANOD	Activate the synchronized announcement immediately,see also AMO COP, value AANT	x	x	
ANS	Answer from the line This parameter marks lines which have a signalling procedure with answer criteria.	x	x	
AOCC	Call charge transmission per connection. Must always be set for CORNET-NQ and QSIG	x	x	CDRE
APPR	Settings are relevant for test purposes and approvals.	x	x	
APSM	Synchronized announcement if PSM	x	x	
ARCF	Convert alternate routing on error to CFU	x	x	
ASTN	A-stationnumber will be checked if allowed for outgoing CO use. Allowed A-numbers have to be entered in dial plan DAR ASTN by means of AMO WABE (ANI CIS)	x	x	CIS
ATDI	Identification of AC (MFC) The CO requests the subscriber number for incoming calls to AC.	x	x	MFC (ITU Q.320-490)
ATRS	Transit counter administration for S0/S2 lines. Configuration of the threshold value in the network using AMO TDCSU, parameter TRACOUNT.	x	x	

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
BCCC	B channel through-connection when the B side answers. This parameter is only set when the OpenScape 4000 functions as a DSS1 trunk, and if the network provider requests that the B channel is only through-connected when the called party answers. Otherwise the B channel is through-connected when the connection has been established.	x	x	
BCNE	B channel negotiation in order to prevent a "preferred-preferred collision". Only necessary for connection to an external system. In this case in AMO TDCSU the parameter BCNEG=Y must be set.	x	x	EDSS1
BFSR	Block forwarding switching after reject	x	x	CFW
BKNA	Activation disables feature Calling Name Delivery	x	x	USA
BLOC	If this parameter is set, the field SENDING_COMPLETE is set to TRUE as soon as the pulse series counter limit is reached (provided by external toll restriction, depends on dialled digits). With QSIG this parameter is always set !!	x	x	
BRAR	This parameter releases the trunk connection on no answer after recall to the originator (AC or night station). The release time after a recall is set with the RELREC parameter of AMO CTIME.	x	x	
BRLA	Branch line, Austria This parameter marks a line as a branch line (11-wire analog tie line with a critierion plan especially for Austria). It may not be set for any other line type.	x	x	Austria
BSHT	Calls to a busy hunting group are not released but linked into the hunting group's call queue. ICPTDID must be set in AMO FEASU.	x	x	
CACO	All incoming ISDN Calling Numbers must be extended with the Alternative Country Code Number (from central switch data, ZANDE), if not already done.	x	x	
CATR	If set, charges are transmitted for analog lines (condition: lines are configured for call charge transmission).	x	x	CDR

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
CBBN	Network-wide callback on busy (only with VFSS and S0/S2)	x	x	
CBFN	Network-wide callback on free (only with S0/S2)	x	x	
CCRO	Completion of Call Retention Option details see Chapter 32, "EDSS1 System Interface / Trunk Interface"	x	x	DSS1
CCTN	Circuit number, CCT-NO in AMO TACSU is used as A number for incoming seizure (CIS).	x	x	CIS
CDBO	The CDR component Record Point via this line is marked as Breakout.	x	x	CDR
CDN	Call Deflection Network-wide	x	x	CFW
CDRD	If set, the authorization of the circuit's COS and not the transmitted authorization of the line is used for CDR. This controls at the carrier whether or not the service AOC (Advice of Charge) has been activated for customers. This parameter has nothing to do with billing on the terminal.	x	x	CDR
CDURSNBR	Activation of Supervision of Transit Connection for incoming transit connections. For more information please refer to Chapter 47, "Restricted Call Duration for Transit Calls".	---	x	
CEBC	Call extension for busy or call state. This applies for analog and digital trunks. See also parameters CEOC, CEBX and CEOC are mutually exclusive.	x	x	
CECO	Call extension by AC to busy station with camp-on.	x	x	
CEOC	Extension via line is only possible in talk state. This applies fir analog and digital trunks. This parameter is a subset of CEBC. CEBC and CEOC are mutually exclusive!	x	x	
CFBN	Call Forward Busy Network-wide	x	x	CFW
CFOS	Network wide call forwarding possible. (valid for all outgoing/incoming circuits with S0/S2 interfaces for trunk/tie traffic Cornet-N or ECMA-Qsig protocols)	x	x	CFW

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
CFTR	Setting FWD for the main station possible. The FWD is activated at the provider.	x	x	CFW
CFVA	Accessiblilty check of the forwarding destination is possible over the line. Valid only for tie connections: an accessiblilty and name is checked.	x	x	
CHRT	Changeover from hold to ringtone. With transfer before answer ringtone is to be injected instead of hold tone.	x	x	
CLAC	Action based on CLI (used for trunk) (see Chapter 100, "Calling Line Identification (CLI) Enhancements")	x	x	replaces R279
CLNA	CLI name translation (used for trunk) (see Chapter 100, "Calling Line Identification (CLI) Enhancements")	x	x	replaces R277
CLNI	CLI number unknown - no intercept to AC (see Chapter 100, "Calling Line Identification (CLI) Enhancements")	x	x	replaces R284
CLN0	CLI number modification (used for trunk) (see Chapter 100, "Calling Line Identification (CLI) Enhancements")	x	x	replaces R278
COEX	Class of externals (Application for China, protocol CSN1) Those circuits are marked which are used for the exchange of these COEXs (COSs, see AMO COSSU).	x	x	Also CIS, France
COTN	An internal (simulated) exchange tone is transmitted down the line for outgoing exchange connections. This is not required for LCR. It only set for all digital tie circuits. The parameter also prevents the early deactivation of the trunk dialling tone in tie traffic.	x	x	
COVN	CO connection through CORNET VN protocol	x	x	

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
CPS6	If this parameter is set, CPS6 is used for digit analysis for incoming trunk connections. Example: Trunk in PBX A. AC is located in PBX B. The "0" has two meanings in PBX B: For incoming trunk calls the "0" reaches the AC. For all other connections the "0" seizes a trunk. By setting CPS6 this is exactly achieved.	x	x	
CSN7	Identification for DIUS2 circuits to CSN7 networks, China	x	x	China
CTAL	Extension only in call or talk state allowed. Applies for analog and digital trunks.	x	x	
CTLN	Controlled trunk and line selection not allowedl, has to be set to forgein nodes	x	x	
CTLS	Controlled trunk and line selection	x	x	
CUG	Closed User Group	x	x	
CWBS	Call waits when station is busy, (CWBS and IBSY cancel each other out!) Set in AMO FEASU, ICPTDID	x	x	
DATA	Trunk for data	x	x	
DCCO	Derive the node number from the CALLING NUMBER, for incoming CO calls.	x	x	
DCPA	Trunk is not able to signalize Directed Call Park	x	x	
DDIC	DDI Control	x	x	replaces R282
DFNN	Use default node number of trunk.	x	x	
DI1	Dialtone on incoming seizure type 1, TSC (Italian Railway)	x	x	Italian Railway
DI1N	Dialtone on incoming seizure type 1 and own node no., TSC (Italian Railway)	x	x	Italian Railway
DI2	Dialtone on incoming seizure type 2, TSC (Italian Railway)	x	x	Italian Railway

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
DI2N	Dialtone on incoming seizure type 2 and own node no., TSC (Italian Railway)	x	x	Italian Railway
DI3	Dialtone on incoming seizure type 3, TSC (Italian Railway)	x	x	Italian Railway
DI3N	Dialtone on incoming seizure type 3 and own node no., TSC (Italian Railway)	x	x	Italian Railway
DISN	Display dailed number of subscriber B at subscr. A	x	x	
DIT	dedicated incoming trunk	x	x	USA
DIUD	DIUC with digital data transfer (i.e. China) This parameter is only set for trunk circuits. (In WABE set the DARs DTED, DTE and/or combi-code DTEDNO, DTENO and with AMO RUFUM set the conversion to the relevant DTE devices).	x	x	
DPRE	If this parameter is set, the actually transmitted dialed digits (e.g. prefix digits, AMO LODR, OUTPULSE) are sent to CDR.	x	x	
DSDL	If set, no call forwarding information (Diversion Legs) is sent. Valid for DSS1 and QSIG (Cornet-NQ) lines.	x	x	CFW
DSIT	disconnect supervision for incoming trunk	x	x	
DTMF	Inband DTMF when SETUP contains no classmarks	x	x	
DTMP	Line with multi-frequency signalling PAKKED (CIS)	x	x	CIS
DTMS	Line with multi-frequency signalling procedure SHUTTLE (CIS)	x	x	CIS
DTNE	With incoming analaog connections external dialtone is injected, alternatively, one of the following parameters can be specified: NTON, VM, DTNI, DTNE or ANNC. The corresponding SIU tone is injected. For outgoing seizure the connection is marked as CO call (only with digital trunks)	x	x	

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
DTNI	With incoming analog connections internal dialtone is injected. Alternatively, one of the following parameters can be specified: NTON, VM, DTNI, DTNE or ANNC. The corresponding SIU tone is injected.	x	x	
EDBA	Line with emergency disconnect before answer.	x	x	
EODL	Emergency override/disconnect only local. Disconnect possible for all analog and digital circuits with the exception of APSE and PSM/CC.	x	x	
ETE	MFC-R2 End-to-End details see Chapter 38, "MFC-R2 Signaling"	x	x	MFC-R2
ETE1	MFC-R2 End-to-End 1 details see Chapter 38, "MFC-R2 Signaling"	x	x	MFC-R2
ETE2	MFC-R2 End-to-End 2 details see Chapter 38, "MFC-R2 Signaling"	x	x	MFC-R2
ETE3	MFC-R2 End-to-End 3 details see Chapter 38, "MFC-R2 Signaling"	x	x	MFC-R2
ETE4	MFC-R2 End-to-End 4 details see Chapter 38, "MFC-R2 Signaling"	x	x	MFC-R2
ETE5	MFC-R2 End-to-End 5 details see Chapter 38, "MFC-R2 Signaling"	x	x	MFC-R2
ETSC	UUS ETSI conform details see Chapter 32, "EDSS1 System Interface / Trunk Interface"	x	x	DSS1
FAX1	FAX intercept when free to phone mail for incoming faxes via trunk.	x	x	
FAX2	FAX intercept when busy to phone mail	x	x	
FLOV	MLPP flash override call - high level	x	x	MLPP
FLSH	MLPP flash call	x	x	MLPP
FNAN	Activation of rerouting with network-wide ring no answer.	x	x	

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
FWDN	Unconditional all forwarding with re-establishment of the connection to the forwarding destination network wide. If this parameter is set, in the case of call forwarding, the forwarding number is returned to the originating node which then establishes a connection to this number. The first connection is released. Valid for all digital interface circuits and must be set in the entire network. From EV1.0, FWDN is supplemented by the COT parameter CFVA which, which instigates a destination check for a network-wide FWD. CFBU and FWDN are mutually exclusive!	x	x	CFW
FWDR	Call forwarding is carried out via re-routing into the public network (Application for France). Call forwarding into the public network with a transit connection in the OpenScape 4000 will not be realized.	x	x	France
HGTR	Hunt group service transportable to partner node	x	x	
IBBA	Send digits via in-band DTMF before answer	x	x	
IBSY	Attendant intercept when busy (IBSY and CWBS cancel each other out!). Set in AMO FEASU, ICPTDID	x	x	
ICZL	Incoming CDR via zone or from line. CDR for incoming traffic is calulated using zone tables (tariff tables) or line billing information (messages). ICZL and ICZO cancel each other out!!	x	x	CDRE
ICZO	Incoming CDR only via zone. Billing for incoming traffic is calulated using zone tables (tariff tables). Billing information from the line is not possible. ICZO and ICZL cancel each other out!!	x	x	CDRE
IDIS	If this parameter is set, all calls with unauthorized dialling codes are switched to the attendant, example: WABE DAR are not permitted for MFC Lines). Only valid for MFC circuits.	x	x	

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
IDND	Attendant intercept for do-not-disturb. Set in AMO FEASU, ICPTDID.	x	x	
IEVT	Diagnostic parameter for registration of implausible events.	x	x	
IFR	Attendant intercept when free after timeout. Set in AMO FEASU, ICPTDID.	x	x	
IGID	Ignore the call ID (i.e. for billing) for incoming connections. The received call ID is ignored and a new one issued (i.e. on the carrier's network borders).	x	x	
IICB	Ignore incoming billing elements. The received paying party and NOTRANS bit (AMO LDAT) from the billing element are ignored.	x	x	CDRE
IIDL	Attendant intercept when dialling is incomplete. Set in AMO FEASU, ICPTDID.	x	x	
IMDI	MLPP immediate call	x	x	MLPP
INAU	Attendant intercept when the dialed station is not authorized.	x	x	
INDG	Attendant intercept when no dialling occurs (do not set with DP!!) Set in AMO FEASU, ICPTDID.	x	x	
IONS	Attendant intercept if a remote override has failed. Set in AMO FEASU, ICPTDID.	x	x	
IRTO	Italian Railway tone. This parameter is to be set for mixed networks (analog/digital) when an interdigit tone is to be recognized. If not set recognition of an interdigit tone is only possible with analog circuits.	x	x	Italy
ITB	Attendant intercept when all trunks busy (i.e. also call queue full). Set in AMO FEASU, ICPTDID.	x	x	
ITRC	If this parameter is set and call transfer is carried out, the recall timer is started in the PBX of the transferring party. This parameter is only relevant for PBXXX (Cornet DPNSS1 Gateway).	x	x	

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
ITRN	If this parameter is set, the number of the trunk circuit is used instead of the transmitted ITR group.	x	x	
ITT	For incoming seizure the CPS 12 (incoming inter-exchange traffic) is set. This parameter applies for analog and digital trunks. Depending on CPS12, exact results can be achieved by digit analysis. If parameter ITT is not set, the digit analysis evaluates incoming digits using CPS10 (incoming extension line). ITT and TIE are mutually exclusive!!	x	x	
IVAC	Attendant intercept when the call number is not available (WABE). Set in AMO FEASU, ICPTDID .	x	x	
KNDI	Camp-on on DID calls (AS and QS)	x	x	
KNEX	Camp-on after extension of incoming trunk calls (AS and QS)	x	x	
KNOR	For a busy station an override or camp-on over the line is possible (valid for analog and digital circuits)	x	x	
KNTE	Knock override to anate using tie-lines allowed Automatically override to extension using TIE-Lines This parameter has the same functionality as KNDI for CO calls (but for TIE lines!)	x	x	
LBPR	LB Line partner for release control	x	x	Pakistan/ Air Force
LINC	Lines with implicit station numbers for carrier. This parameter marks lines from carrier systems to customer systems. These lines are used to send the implicit station numbers (without exit ID i.e. 098 722 4711 or only 4711) as Calling Number. It should always be set on the carrier system. LINC and LINO may not be used together!!	x	x	

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
LINO	Lines with implicit station numbers. This parameter must always be set if old (< Hicom 300 V3.5) or external systems connected to this line can only accept implicit station numbers and transmit an undefined or incorrect NPI/TON combination to a destination number. To determine this generally takes a great deal of effort. It is therefore recommended that the COT parameter for lines to old or external systems be set. LINO and LINC may not be used together!!	x	x	
LPRN	Line with permanent restricted numbers to EDSS1 CO	x	x	EDSS1
LRPM	With multiple FWD the phone mail of the last forwarding destination is activated.	x	x	
LWNC	If set, no node number is sent. This parameter is set for the features "Station number signaling with open numbering" and "Prevention of network loops and unalloed connections".	x	x	
MAOV	Manual override (China)	x	x	China
MCIW	Mailbox call-back interworking with OpenScape Business/HiPath 3000. This parameter is set in order to achieve error free signalling when a station of a partner node OpenScape Business/HiPath 3000 has placed a call-back request in the mailbox. This applies for QSIG and call-back from the OpenScape Business/HiPath 3000.	x	x	
MFC	Line with MFC signalling. In AMO MFCTA, MFCVAR> 0 must be set!	x	x	
MFOB	This parameter must be set so that an incoming DID call via a main PBX to a satellite PBX can be established, regardless of whether the CORNETN or MFC-R2 protocol for CIS is used. This is the case when a CIS MFR-R2 protocol is used, this means without busy signal and at the same time release control. (see AMO COT, COEX).	x	x	CIS
MICC	MCID call clearing control required details see Chapter 115, "DSS 1 Terminals"	x	x	DSS1

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
MIIH	MCID identify here details see Chapter 115, "DSS 1 Terminals"	x	x	DSS1
MLPR	Trunk can be used for mlpp-preemption	x	x	Belgien, USA MLPP
MRCA	Manual call connection after conference override.	x	x	CIS
MSIR	MSI Line with release control	x	x	Pakistan/ Air Force
NAAT	North America Analog Trunks	x	x	USA
NCDR	Suppress signaling of CDR-E specific messages	x	x	CDRE
NCHD	No charge data during call If set, no advice of charge information (AOCD) is sent to the partner PBX during the connection.	x	x	CDRE
NCHG	This parameter is obsolete but still exists in the code.	x	x	
NCT	network call transfer, explicit call transfer	x	x	USA
NCTP	No CFNR after transfer possible to nodes behind	x	x	
NIN2	No multi-level precedence and preemption on trunk	x	x	MLPP
NITO	No intercept with transit. If set, there is no attendant intercept for transit and outgoing connections.	x	x	
NLCR	This parameter should be set when LCR authorizations (least Cost Routing) cannot be sent over the line (i.e. different protocols), or when the transmitted LCR authorizations are to be ignored. The LCR authorozations for the circuit are used for "voice" (parameter LCOSV).	x	x	LCR
NLHT	No local hold tone. This parameter allows an external hold tone (i.e. music) from a central place.	x	x	

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
NLRD	This parameter should be set when LCR authorizations (least Cost Routing) cannot be sent over the line (i.e. different protocols), or when the transmitted LCR authorizations are to be ignored. The LCR authorizations for the circuit are used for "Data" (parameter LCOSD).	x	x	
NMLT	No multi-level precedence and preemption on trunk	x	x	Belgium, USA MLPP
NMRN	The format of REDIRECTING_NUM doesn't need to be same as REDIRECTION_NUM	x	x	
NOCI	No notification for conference supplementary service	x	x	
NOCT	No notification for call transfer and call hold supplementary services	x	x	
NOFT	No Flag Trace	x	x	
NOHO	can not be put on hold for network-wide conference	x	x	
NORR	No re-routing. This parameter is set for lines without an evaluated end-of-dial or for lines for which after seizure no further re-routing is required.	x	x	LCR
NOSD	no simple dialog available	x	x	
NOTO	near ton generation	x	x	
NOVC	No override on CO connections.	x	x	
NPIS	NPI ISDN, abgehender Verkehr	x	x	CFW
NPPR	NPI PRIVATE, abgehender Verkehr	x	x	CFW
NPUN	NPI UNKNOWN, abgehender Verkehr	x	x	CFW
NQNP	CorNet-NQ Network-wide Pick-up not supported details see Chapter 76, "Call Pickup"	x	x	
NQPI	CorNet-NQ Pickup-Info not supported details see Chapter 76, "Call Pickup"	x	x	
NRAA	Signalling without backwards release after answer (only analog, valid i.e. for transfer).	x	x	

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
NRBA	Signalling without backwards release before answer (only analog, valid i.e. for transfer).	x	x	
NTBO	Netborder to private or public net, no rerouting	x	x	
NTON	No tone. No tone for incoming analog connections. An alternative is to enter one of the following parameters: NTON, VM, DTNI, DTNE or ANNC. Then the relevant SIU tone will be activated.	x	x	
OHKQ	off hook queuing für Transiverbindungen	x	x	USA
ORRN	Originally called party number send via redirected number	x	x	CFW
OSCV	OpenScape 4000 - OpenScape Voice interworking	x	x	replaces R283
OVRA	Override for operators (Flash to CO)	x	x	
PDOB	Postdial when the dialled station is busy.	x	x	
PDOT	Postdial when the dialled station does not answer.	x	x	
PGEP	Partner node does not know OpenScape 4000 GEP signalling	x	x	CDRE
PINR	PIN remote possible (incoming and outgoing) This parameter must be set on both sides of the connection.	x	x	
PM8D	Phonemail can not handle numbers longer than 8 digits that are marked as internal	x	x	
PNEV	Suppression user guidance VMS EG-Display. With inband signalling, this parameter prevents interference of the voice channel during the transfer of display information from VMS via PNE to the station. This means that spoken user guidance is no longer interrupted. The user guidance on the terminal display is suppressed.	x	x	

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
PRI	Priority line. Up to V2.0: Calls over lines with this parameter set are given priority in the AC call queue. From V3.0: This parameter marks lines with signalling protocols which can signal line priorities of incoming trunk groups at the network borders.	x	x	
PRIC	MLPP priority call	x	x	MLPP
PRNI	Prevent node information Is this paramter set, no NODE Information (NI) will been sent in the SETUP (BC)	x	x	
PROV	Network-wide emergency override/release possible (S0/S2 trunk circuits or E & M and CF signalling). Condition: in AMO FEASU the feature NAUFTR must be available.	x	x	
R277	CLI name translation (used for trunk)	-	-	as of V6 see CLNA
R278	CLI number modification (used for trunk)	-	-	as of V6 see CLN0
R279	Action based on CLI (used for trunk)	-	-	as of V6 see CLAC
R282	DDI Control	-	-	as of V6 see DDIC
R283	OpenScape 4000 - OpenScape Voice interworking	-	-	as of V6 see OSCV
R284	CLI number unknown - no intercept to AC	-	-	as of V6 see CLNI

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
RCBS	This parameter is set for incoming seizure of a station with "release control" which when the other party goes on hook activates busy tone or displays a fixed text. If the other party picks up the handset again, the busy tone is to be deactivated or the fixed text is deleted. CIS application with ISKRATEL prefix.	x	x	CIS
RCL	Recall to AC if user hangs up after consultation call (applies for all circuits)	x	x	
RCLS	Automatic recalls to the AC are suppressed in nodes without AC. Valid for all circuits.	x	x	
RDDI	Line with synchronized announcement as proceed-to-select signal with DDI	x	x	synchr. announcement
RLIN	receive trailing lin digits RLIN and SECO may not be used together!!	x	x	
ROPT	This parameter is set for lines supporting route optimization	x	x	
ROUT	MLPP dsn-routine	x	x	MLPP
SANH	Synchronized announcement of non OpenScape 4000 incoming call	x	x	
SATC	Satellite connection via S0/S2 lines. Configuration of threshold value for the maximum number of satellite connections in the network with AMO TDCSU, parameter SATCOUNT.	x	x	
SATR	Synchronized announcement type transport	x	x	
SDID	Line with single-digit DID If set, a partial digital analysis (if activated) for analog and digital circuits will be deactivated.	x	x	
SECO	Send emergency call outgoing d-channel info RLIN and SECO may not be used together!!	x	x	
SIRI	Calls incoming over digital central office trunks from other branches via VPN ring as an internal call & calls incoming from other sources ring as an external call.	x	x	
SNBE	Send no billing element (paying party =call number plus node number).	x	x	CDRE
SPAH	Park system and hold analog connection	x	x	USA

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
SPCM	This parameter is set to compress the B channel for voice signaling details see Chapter 57, "Voice Compression"	x	x	VC
SPCP	Voice compression preferred	x	x	VC
SPSR	Trunk to voice server in foreign node	x	x	
STH3	Special classmark assignment for outgoing call by station with CO party on hold - necessary for interworking with OpenScape Business/HiPath 3000	x	x	
SUPN	Suppress name network-wide	x	x	
T4WA	COT in connection with the T-Reference (digital attenuation). If the 4-wire-connection is to be recognized during device definition in association with an analog connection (tie), then this parameter must be set.	x	x	
TCC	Incoming tie traffic CO call signaling	x	x	Pakistan/ Air Force
TCET	Through connection with call tranfser in call state for ISDN transit. If the parameter is set, the connection is switched through in "Transfer ringing" state and no hold tone is injected.	x	x	
TGRE	Trunk group for re-routing. Only for C-Tel company.	x	x	LCR
TIE	For incoming seizures, the CPS 11 (tie incoming) is always set. This parameter is only valid for analog and digital tie circuits. This allows, dependant on CPS11, exact results in the digit analysis. If TIE is not set digit analysis of the incoming numbers is nade with CPS 10 (incoming station line). TIE and ITT cancel each other out!!	x	x	
TIEI	Identification of tie lines (MFC) The CO requests the subscriber number for incoming trunk calls to tie lines.	x	x	MFC (ITU Q.320-490)

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
TMFC	Seize transit circuit upon completion of MFC signaling (FREE is signaled towards CO), application: France	x	x	France
TMUSIC	Number of music on hold recording	x	x	
TNDV	Tone is injected from the station (for analog and digital S0/S2 trunks).	x	x	
TR6T	Line with 1TR6 link, if OpenScape 4000 emulates the "network side". This emulates tone injection as if it came from the 1TR6 CO (OpenScape 4000 acts as 1TR6 CO). The protocol variant 1TR6N must be set for the circuit.	x	x	
TRAI	If set, tracing of trunk calls is possible. This means a trace can be signalled over this line towards the CO.	x	x	
TRBA	Transfer before answer on DSS1	x	x	
TRID	Provide Trunk Data (PEN) for identification by AC	x	x	
TRSC	Trunk sends call charges (currency amounts) to originating node. If TRSC is not set, units are reported to the originating node. where the value Unit is set using AMO ZAND , TYPE=CCD, parameter CDDISPEX	x	x	CDR
TSCS	TSC signaling of the external mailbox messages.	x	x	
TWDS	This attribute set means that this trunk can be connected to another trunk when none of them has Disconnect Supervision.	x	x	
US1E	UUS1-explizit Service is allowed	x	x	DSS1
USBT	UUS3 service may be requested by called Party details see Chapter 32, "EDSS1 System Interface / Trunk Interface"	x	x	DSS1
USCC	Congestion Control for User-User Service details see Chapter 32, "EDSS1 System Interface / Trunk Interface"	x	x	DSS1
USCD	Restriced UUS-Services for interaction with Call Diversion details see Chapter 32, "EDSS1 System Interface / Trunk Interface"	x	x	DSS1

Par.	Description	HiPath 4000 V6	OpenS 4000 V7	Note
USD	Postdial (unrestricted) possible (France). This parameter is set to allow DIGITEs in call state unrestricted postdialling for established incoming and outgoing connections (analog/ CAS_) over the line with the configured dial type.	x	x	France
UUS1	User-User-Service ISDN Class1 (Connection setup request, SET UP Basic Call) details see Chapter 150, "User-to-User Service"	x	x	DSS1
UUS2	User-User-Service ISDN Class2 (Connection setup Basic Call) details see Chapter 150, "User-to-User Service"	x	x	DSS1
UUS3	User-User-Service ISDN Class3 (Connection Basic Call) details see Chapter 150, "User-to-User Service"	x	x	DSS1
VCMN	Voice compression not allowed details see Chapter 57, "Voice Compression"	x	x	VC
VM	VM tone. For incoming analog connections the VM tone is injected. Alternatively, one of the following parameters may be specified: NTON, VM, DTNI, DTNE or ANNC. The corresponding SIU tone is injected.	x	x	
VNCO	Send virtual subscriber number to CO	x	x	
VOCE	Trunk for voice	x	x	
WAAN	Synchronized wait announcement with call to AC	x	x	synchr. announcement
XFER	Trunk call transfer	x	x	
XTRC	If this parameter is set and call transfer is carried out, the recall timer is not started in the PBX of the transferring party but in the PBX of the held party. This parameter is only relevant for PBXXX (Cornet DPNSS1 Gateway).	x	x	

17.1.2 Examples of COT Parameter Initializations

This section shows basic initialization sets for a number of given network configurations.

Each example may be expanded with further useful COT parameters where appropriate.

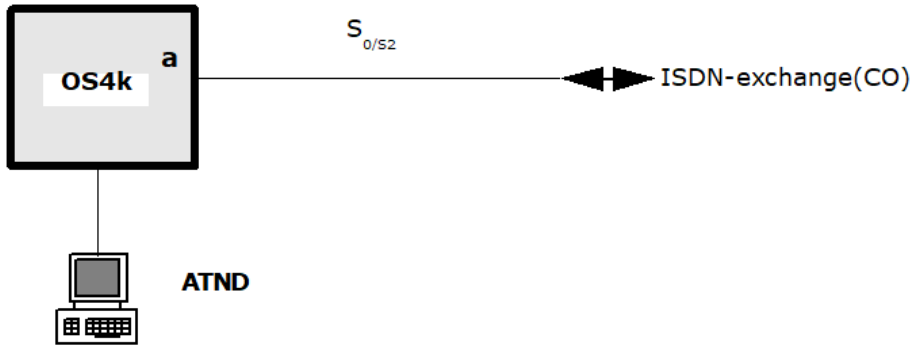
Selected network configurations:

- Digital exchange traffic via S0/S2 interface
- Digital main/satellite PBX traffic via S0/S2 interface (OpenScape 4000/ OpenScape 4000)
- Digital tie traffic via S0/S2 interface
- Digital inter-PBX traffic via S0/S2 interface (OpenScape 4000/OpenScape 4000 = Local Internal Networking)
- Main / Satellite PBX traffic with loop signalling
- Main / Satellite PBX traffic with WTK signalling
- Digital exchange (CO) traffic with speed dialling
- Networking

IMPORTANT: Note on figures and tables in the examples: Lower case letters " a ", "b", "c", ..., "z" in figures and tables indicate that the parameters are direction-specific. This is important to remember when dealing with OpenScape 4000 configurations with more than one outgoing direction.

17.1.2.1 Digital exchange traffic via S0/S2 interface

- With attendant intercept
- With attendant recall



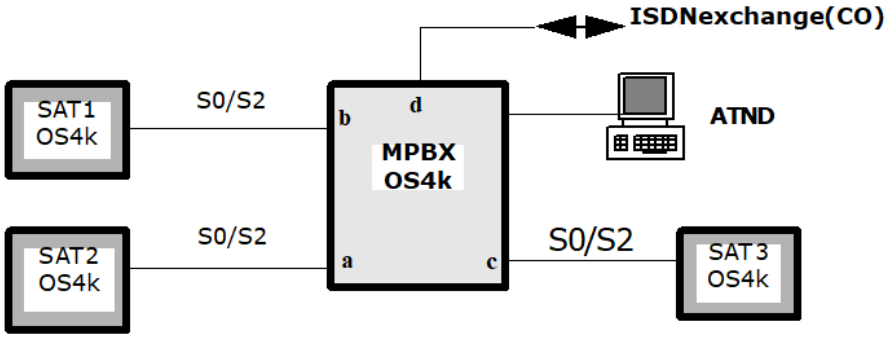
- S0 board: STMD S2 board: DIUS2
- Protocol variant for ISDN exchange:
  - PROT: N1 (1 TR6)
  - PROTVAR: 1 TR6, SWISNET2, FRA, BLUEBOOK
- COP parameter: SFRM (for 1 TR6, FRA)
- LWPAR for S2: TYPE = DIUS2, BLNO = 0

Parameter	Digital exchange traffic via S0/S2 interface (with attendant intercept / with attendant recall)	Digital exchange traffic via S0/S2 interface, with attendant (with attendant recall)	Digital exchange traffic via S0/S2 interface, without attendant
ANS	X	X	X
LTMG	X	X	X
IIDL	X		
IVAC	X		
IBSY	X		
INAU	X		
ITB	X		
IDND	X		
IFR	X		
NTON	X	X	X
RCLS			X
IDIS	X		
Further useful COT parameters	KNOR, OVRA, CHRT, TRAI, IEVT	KNOR, OVRA, CHRT, TRAI, IEVT	TRAI, IEVT

17.1.2.2 Digital main/satellite PBX traffic via S0/S2 interface (OpenScape 4000/ OpenScape 4000)

- Exchange interface and ATND only in main PBX
- Protocol variant for ISDN exchange:
  - PROT: N1 (1 TR6)
  - PROTVAR: 1 TR6, SWISNET2, FRA, Bluebook

- Protocol variant for S0/S2 connection:
  - PROT: I (CorNet)
  - PROTVAR: CORNV3 (CorNet-N), FRA, Bluebook
  - LWPAR for ISDN CO : TYPE = DIUS2, BLNO = 0, MASTER = Y
  - LWPAR for S2 CONN: TYPE = DIUS2, BLNO = 1, MASTER = N



1) With call transfer:

- Main PBX
  - Consultation via same line with direction test
  - Attendant recall
  - Camp-on / override
  - Call transfer in busy / ringing / talking state
- Satellite PBX 1
  - Consultation via same line with direction test
  - Camp-on / override
  - Call transfer in busy / ringing / talking state
- Satellite PBX 2
  - Consultation via same line with direction test
  - Camp-on / override
  - Call transfer in busy / ringing / talking state
- Satellite PBX 3
  - Consultation via same line with direction test
  - Camp-on / override
  - Call transfer in busy / ringing / talking state
- Protocol variant for ISDN exchange:
  - PROT: N1 (1 TR6)
  - PROTVAR: 1 TR6, SWISNET2, FRA, Bluebook
- Protocol variant for S0/S2 connection:
  - PROT: I (CorNET)
  - PROTVAR: CORNV3 (CorNET-N), FRA, Bluebook
  - LWPAR for ISDN-AMT: TYPE = DIUS2, BLNO=0, MASTER = Y
  - LWPAR for S2 CONN : TYPE = DIUS2, BLNO=1, MASTER=N

2) With call acceptance:

- Main PBX
  - Consultation via same line with direction test
  - Attendant recall
  - Camp-on / override
  - Call acceptance
- Satellite PBX 1
  - Consultation via same line with direction test
  - Camp-on / override
  - Call acceptance
- Satellite PBX 2
  - Consultation via same line with direction test
  - Camp-on / override
  - Call acceptance
- Satellite PBX 3
  - Consultation via same line with direction test
  - Camp-on / override
  - Call acceptance

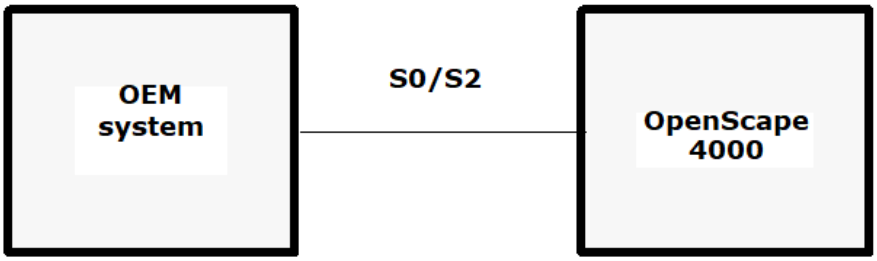
Parameter	With call transfer							With call acceptance						
	Main PBX				Satellite PBX			Main PBX				Satellite PBX		
	a	b	c	d	1	2	3	a	b	c	d	1	2	3
ANS	X	X	X		X	X	X	X	X	X		X	X	X
LTMG				X							X			
NTON	X	X	X	X	X	X	X	X	X	X	X	X	X	X
KNOR	X	X	X		X	X	X	X	X	X		X	X	X
CEBC	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RCLS					X	X	X					X	X	X
COTN								X	X	X		X	X	X
Further useful COT parameters	TRAI, ATDI							TRAI, ATDI						

17.1.2.3 Digital tie-line traffic via S0/S2 interface

1) Digital tie-line traffic via S0/S2 system (OpenScape 4000/OEM system), without features:

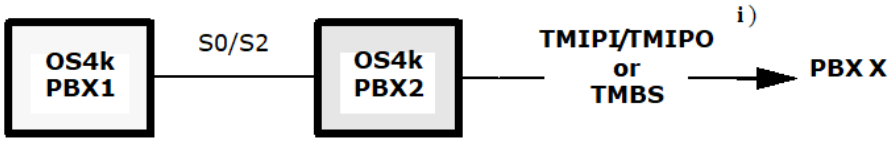
- S0 board: STMD
- S2 board: DIUS2
- Protocol variant for S0/S2:
  - PROT: N1 (1 TR6)
  - PROTVAR: 1 TR6
- LWPAR for S2 CONN: TYPE = DIUS2, BLNO = 0

IMPORTANT: Procedures via the interface between OpenScape 4000 and an OEM system must be carried out according to the 1 TR6! protocol.



2) Digital tie-line traffic via S0/S2 interface (OpenScape 4000/OpenScape 4000), with features:

- PBX 1
  - Consultation via same line with direction test
  - Camp-on / override
  - Call transfer in busy / ringing / talking state (see figure: i))
- PBX 2
  - Consultation via same line with direction test
  - Camp-on / override
  - Call transfer in busy / ringing / talking state (see figure: i))
- S0 board: STMD
- S2 board: DIUS2
- Protocol variant for S0/S2: PROT-I (CorNet)
- LWPAR for S2 CONN: TYPE = DIUS2, BLNO=0



IMPORTANT: If the external OpenScape 4000 lines are provided using TMIPI, TMIPO or TMBS boards, only the

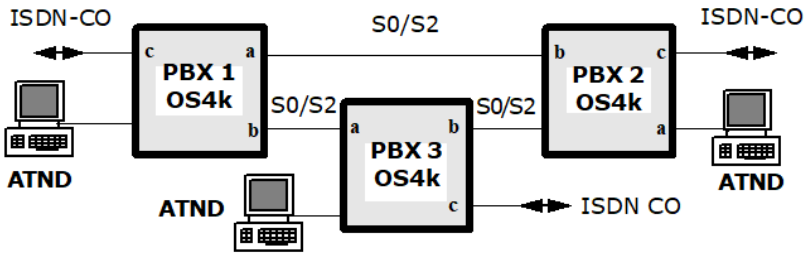
"call accept" function is possible for calls extended via consultation call.

Parameter	Digital tie-line traffic via S0/S2 interface (without features)	Digital tie-line traffic via S0/S2 interface (with features)	
	OpenScape 4000	PBX 1	PBX 2
XFER		X	X
ANS	X	X	X
NTON	X	X	X
KNOR		X	X
CEBC		X	X
CEOC	---		
TIE	X	X	X
RCLS	X	X	X
COTN	X		
Further useful COT parameters	IEVT	COTN	

17.1.2.4 Digital Inter-PBX traffic via S0/S2 Interface (OpenScape 4000/OpenScape 4000= Local Internal Network)

1) Each PBX has an attendant and an exchange interface

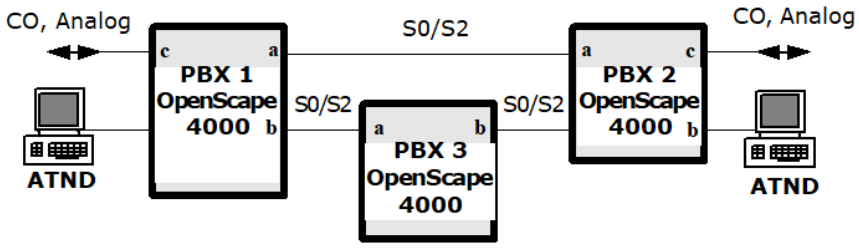
- PBX 1
  - Consultation via same line with direction test
  - Attendant recall
  - Camp-on / override
  - Call transfer in busy / ringing / talking state
- PBX 2
  - Consultation via same line with direction test
  - Attendant recall
  - Camp-on / override
  - Call transfer in busy / ringing / talking state
- Anl. 3
  - Consultation via same line with direction test
  - Attendant recall
  - Camp-on / override
  - Call transfer in busy / ringing / talking state
- Protocol variant for ISDN exchange: PROT: N1 (1 TR6)
- Protocol variant for S0/S2 connection:
  - PROT: I (CorNet)
  - PROTVAR: CORN3 (CorNet-N)



IMPORTANT: User A is in talking state with user B. If the COT parameter CNDT is set, and trunk group overflow is configured, user B would be unable to reach user C via a consultation call.

2) Not all PBXs have exchange interfaces and attendants:

- PBX 1
  - Consultation via same line with direction test
  - Attendant recall
  - Camp-on / override
  - Call transfer in busy / ringing / talking state
- Anl. 2
  - Consultation via same line with direction test
  - Attendant recall
  - Camp-on / override
  - Call transfer in busy / ringing / talking state
- Anl. 3
  - Consultation via same line with direction test
  - Camp-on / override
  - Call transfer in busy / ringing / talking state
- Protocol variant for ISDN exchange: PROT: N1 (1 TR6)
- Protocol variant for S0/S2 connection:
  - PROT: I (CorNet)
  - PROTVAR: CORN3 (CorNet-N)



IMPORTANT: User A is in talking state with user B. If the COT parameter CNDT is set, and trunk group overflow is configured, user B would be unable to reach user C via a consultation call.

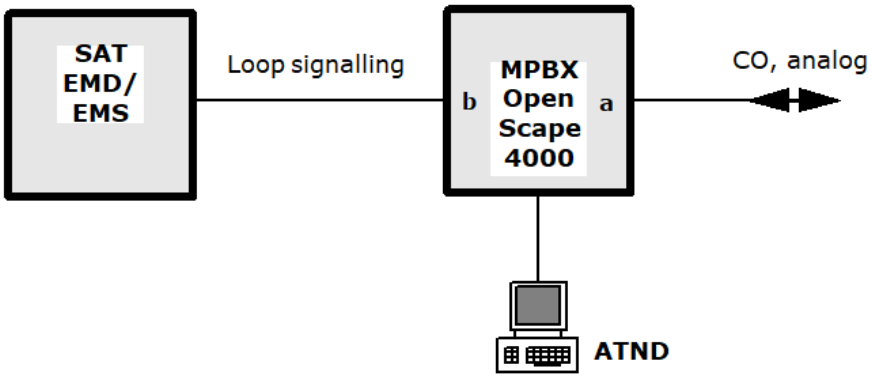
	Each PBX has an attendant and an exchange interface									Not all PBXs have exchange interfaces and attendants							
	PBX1			PBX2			PBX3			PBX1			PBX2			PBX3	
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b
ANS	X	X		X	X		X	X		X	X	X	X	X	X	X	X
AEOD												X			X		
NTON	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CNDT	X	X		X	X		X	X		X	X		X	X		X	X
KNOR	X	X		X	X		X	X		X	X		X	X		X	X

	Each PBX has an attendant and an exchange interface									Not all PBXs have exchange interfaces and attendants							
	PBX1			PBX2			PBX3			PBX1			PBX2			PBX3	
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b
CEBC	X	X		X	X		X	X		X	X		X	X		X	X
ZWVK	X	X		X	X		X	X		X	X		X	X		X	X
RCLS																X	X
COTN	X	X		X	X		X	X									
Further useful COT parameters	TRAI									TRAI							

17.1.2.5 Main / Satellite PBX traffic with loop signalling or WTK signalling

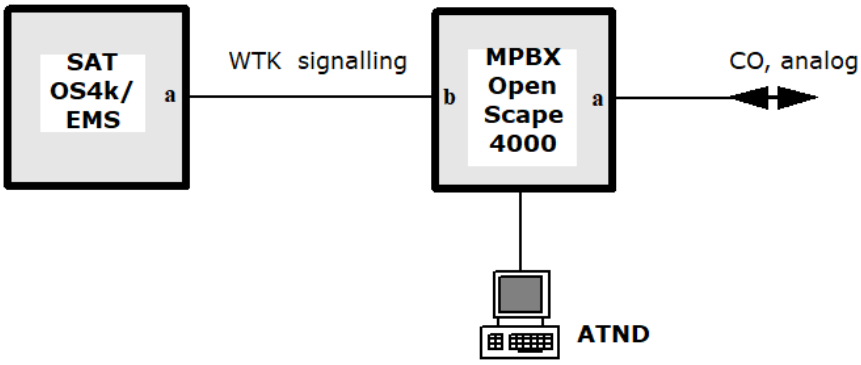
1) Loop signalling

- Main PBX
  - Attendant recal
  - Camp-on / override
  - Call accept for exchange (CO) calls
- Satellite PBX
  - Consultation via same line with direction test (exchange traffic only)
  - Call accept for exchange (CO) calls
- Board: TMBS (satellite connecting trunk in Main PBX)
- LWPAR for TMBS: TYPE = NWLOOP



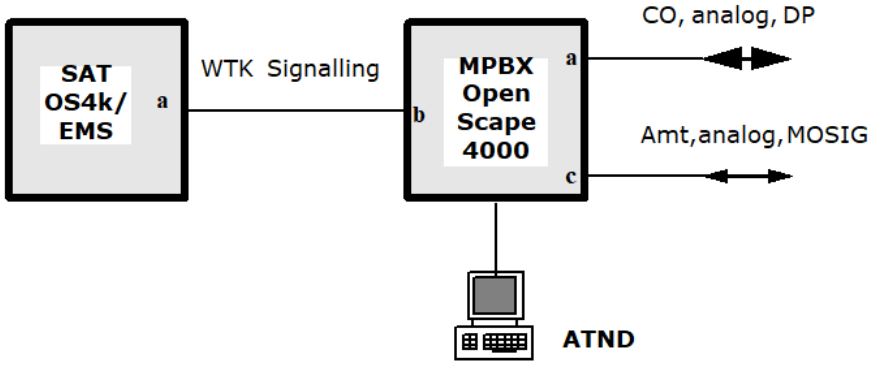
2) WTK signalling with call accept for exchange calls

- Main PBX
  - Attendant recall
  - Camp-on / override
  - Call accept for exchange (CO) calls
- Satellite PBX
  - Consultation via same line with direction test (exchange traffic only)
  - Camp-on / override
  - Call accept for exchange (CO) calls
- Board: TMBCT
- LWPAR for TMBCT: TYPE = NWWTK, default values (except for individual parameters such as authorizations and SPD)



3) WTK signalling with call transfer of exchange (CO) calls

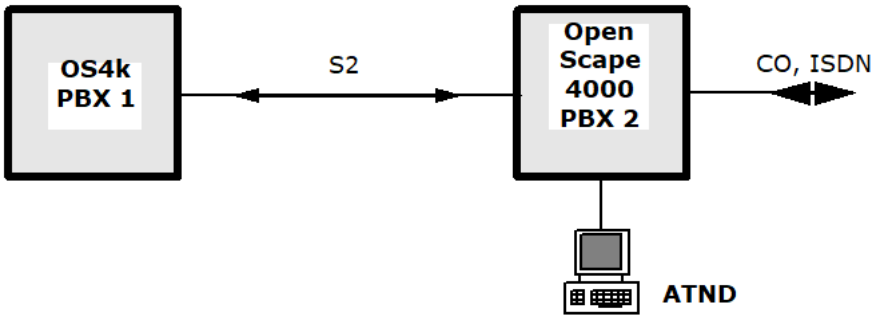
- Main PBX
  - Attendant recall
  - Camp-on / override
  - Call transfer of exchange (CO) calls
- Satellite PBX
  - Consultation via same line with direction test (exchange traffic only)
  - Camp-on / override
  - Call transfer of exchange (CO) calls
- Board: TMBCT
- LWPAR for TMBCT: TYPE = NWWTK, default values (except for individual parameters such as authorizations and SPD)



Paramete	Loop signalling		WTK signalling (Call accept for exchange (CO) calls)			WTK signalling (with call transfer of exchange (CO) calls in talk state)			
	PBX 1		Main PBX 1		SAT PBX	Main PBX 1			SAT PBX
	a	b	a	b	a	a	b	c	a
RCL			X			X			
ANS	X	X	X	X	X	X	X	X	X
AEOD	X		X			X		X	
NTON	X	X	X	X	X	X	X	X	X
KNOR		X		X	X		X		X
CEOC				X	X		X		X
RCLS									X
COTN									X
Further useful COT parametersr	IEVT		IEVT			IEVT			

17.1.2.6 Digital exchange (CO) traffic with speed dialling

- PBX 1:
  - Consultation via same line with direction tes
  - Camp-on / override
  - Call transfer in busy state
  - Speed dialling
- PBX 2:
  - Consultation via same line with direction tes
  - Camp-on / override
  - Call transfer in busy / ringing / talking state
  - Speed dialling

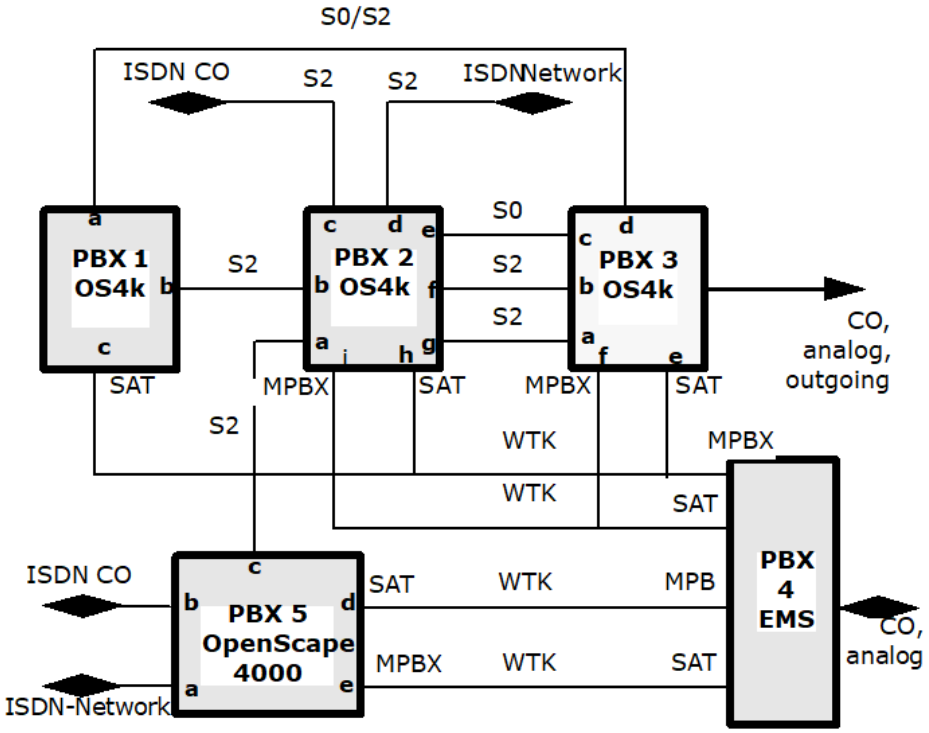


- S2 board: DIUS2
- No Class of Parameter (COP)
- Protocol variant for ISDN exchange:
  - PROT: N1 (1 TR6)
  - PROTVAR: 1 TR6, SWISNET2, FRA, Bluebook
- Protocol variant for S2 connection:
  - PROT: I (CorNET)
  - PROTVAR: CORNV3 (CorNET-N)
- LWPAR for ISDN CO : TYPE = DIUS2, BLNO=0, MASTER = Y
- LWPAR for S2 CONN: TYPE = DIUS2, BLNO = 0

Parameter	PBX 1	PBX 2
XFER	X	X
ANS	X	X
NTON	X	X
KNOR	X	X
CEBC	X	X
RCLS	X	X
COTN	X	X

17.1.2.7 Networking

- PBX 1:
  - Consultation via same line without direction test
  - Attendant recall
  - Camp-on / override
  - Call transfer in busy / ringing / talking state
- PBX 2:
  - Consultation via same line without direction test
  - Attendant recall
  - Camp-on / override
  - Call transfer in busy / ringing / talking state
- PBX 3:
  - Consultation via same line without direction test
  - Attendant recall
  - Camp-on / override
  - Call transfer in busy / ringing / talking state
- PBX 5:
  - Consultation via same line without direction test
  - Attendant recall
  - Camp-on / override
  - Call transfer in busy / ringing / talking state
- WTK board: TMBCT
- Protocol variant for ISDN exchange: PROT-N1 (1 TR6)



	PBX 1			PBX 2									PBX 3						PBX 5				
	a	b	c	a	b	c	d	e	f	g	h	i	a	b	c	d	e	f	a	b	c	d	e
ANS	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X			X	X	X
LTMG						X														X			
NTON	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CNDT	X	X		X	X			X	X	X			X	X	X	X					X		
KNOR	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X			X	X	X
CEBC	X	X	X	X	X			X	X	X			X	X	X	X					X		
FWDN	X	X			X				X	X			X	X	X	X					X		
FNAN	X														X						X		
CBBN	X	X			X				X	X			X	X	X	X					X		
CBFN	X	X			X				X	X			X	X	X	X					X		
COTN	X	X	X	X	X				X	X	X		X	X	X	X	X				X	X	

17.1.3 Configurations for foreign countries

refer to Chapter 176, "Parameter Generation and Signaling for International Markets".

17.2 ADIU - Attenuation of DIUC trunk circuits (CIS)

Feature:

This COT parameter is responsible for the amplification of DIUC trunk circuits for CIS.

Function:

If this parameter is set the relevant DIUC trunk circuits is amplified.

Amplification is required for a connection of a digital trunk group to an analog local exchange. The amplification is carried out in the OpenScape 4000, as the converter of the analog local exchange cannot be set to a higher level. Although it is only required for incoming connections (voice), it has to be set for all connections.

If this parameter is set the TREF matrix is read.

Device types:

DIUC trunk circuits

17.3 AICF - ATND intercept if the call is identified as forwarded

Feature:

Call forwarding to central office, intercept to ATND

Function:

An incoming call via an MFC trunk that is identified as forwarded is not forwarded to the central office, but intercepted to the ATND if the COT parameters MFC and AICF are set for the incoming busy MFC trunk. If, on the other hand, COT parameter MFC is set and COT parameter AICF is not set, then the incoming call is canceled with a congestion signal if a forwarded incoming call is to be routed to the central office on the basis of call forwarding.

Device types:

Analog trunks with MFC signaling, e.g. ICF, ICLCH, ICLLP, ICLFB, ICLIB

Protocol variants:

ANALOG Protocols for analog trunks

17.4 ANNC - Activate local announcement to calling system for incoming seizure of analog trunk

Feature:

Activate local announcement for incoming seizures

Function:

When an analog trunk is seized in an incoming direction, a local announcement (AMO ZAND, SIU ... SIU tone assigned) is played back to the calling system instead of an internal or external dial tone if the trunk parameter ANNC is set in the COT of the incoming seized trunk.

In the case of the analog devices generated
under the DH types (see AMO TACSU)
DB_DH_DEV_TYP_QS_SCH/...QS_SIM/...QS_TF/...QS_EM/...QS_WES, the local announcement is only activated if the line parameter ANNC is activated and the line parameter DTN is deactivated in the COP of the relevant trunks.

Only one of the COT parameters for the tone types may be set: either PAR=NTON ... no tone or PAR=DTNI ... internal dial tone or PAR=DTNE ... external dial tone or PAR=VM ... voice mail or PAR=ANNC ... local announcement. If this is not followed, then a COT cannot be set up or modified. Error messages F04 or F05 are output.

F04: No parameter value specified for tone type NTON, DTNI, DTNE, VM or ANNC

F05: Only one of the following tone types may be specified: NTON, DTNI, DTNE, VM or ANNC

AMO Interrelationships:

COT Classes of Trunks:	NTON, DTNI, DTNE, VM

COP Classes of Parameters:	ANNC, DTN on analog trunks
TACSU Configure Analog Trunks:	Note device types for COP assignments
ZAND Central System Data:	SIU ... Assigned SIU tone

Device types:

Analog and digital CO trunk circuits, interface circuits and tie trunk circuits

Protocol variants:

All

17.5 ANS - Trunk signaling answer

Feature:

Basic traffic, transfer consultation connections, automatic call distribution (ACD)

Function:

The parameter ANS identifies lines that have a signaling procedure with answer criterion. The called system signals to the calling system that subscriber B has answered or an artificial answer is simulated in the device handler of the calling system if the called system cannot signal answering.

The parameter is always to be set in the COT of the relevant lines in the case of digital or analog networking trunks. On the other hand, the ANS trunk parameter does not need to be set in the COP assigned to these trunks.

In the case of analog trunks, the parameter ANS generally only to be set if the ANS line parameter is also to be set in the COP of these trunks. See "Use of COP parameters with different signaling procedures".

AMO Interrelationships:

COP Classes of Parameters:	ANS .... Line supports answering

Device types:

Analog and digital CO trunk circuits, interface circuits and tie trunk circuits

Protocol variants:

CORNV33	CorNet protocol
CORNV33R	CorNet protocol
ECMA1	ECMA QSIG V1 protocol
ECMA1R	ECMA QSIG V1 protocol
ECMAV2	CorNet-NQ Issue 2.1 Dec. 96 Basic ETSI

ECMAV2R	QSIG ETSI ETS 300 172 3rd. with SS 2nd.
PSS1V2	CorNet-NQ Issue 2.1 Dec. 96 Basic ISO/IEC
PSS1V2R	QSIG ISO ISO/IEC 11572 2nd. with SS
EDSGER	EDSS1 protocol for Germany
ETSI	Standard EURO-ISDN
EDSS1NET	EDSS1 Net Side protocol
ANALOG	Protocols for analog trunks

17.6 ATRS - Activate network loop check with transit counter

Feature:

Network loop limit with TRANSIT COUNTER

Function:

The ATRS parameter can be used to activate or deactivate network loop checking with TRANSIT COUNTER for S0/S2 tie trunk circuits or interface circuits. This counter prevents endless loops in the network. Thresholds are set in every node for incoming trunks or trunk groups. The current counter carried in the network protocol is incremented in each transit node passed and compared with the administered threshold. When the threshold is reached, the connection is cleared and a message appears on the terminal.

The TRANSIT COUNTER check must be activated with COT parameter ATRS and the connection between the calling and called node may not be prohibited in the node connection matrix.

AMO Interrelationships:

TDCSU: TRACOUNT .... TRANSIT counter threshold

IMPORTANT: Protocol variants **PROTVAR** and **TRACOUNT** must be identical in all BCGR B channel groups of a trunk.

KNMAT: CONN=E .... Allow connection from ONNO to DNNO

Device types:

Digital tie trunk circuits and interface circuits:

Protocol variants:

CORNV33 - CorNet protocol

CORNV33R - CorNet protocol

ECMA1 - ECMA QSIG V1 protocol

ECMA1R - ECMA QSIG V1 protocol

ECMAV2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ETSI

ECMAV2R - QSIG ETSI ETS 300 172 3rd. with SS 2nd.

PSS1V2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ISO/IEC

PSS1V2R - QSIG ISO ISO/IEC 11572 2nd. with SS

17.7 BCNE - B-channel negotiation for EDSS1

Feature:

B-channel negotiation (Call Collision)

EDSS1 System Interface / Trunk Interface

Function:

The BCNE parameter must be active both on the user side and in the network. The already existing B-channel collision resolution "preferred<->exclusive and exclusive<->preferred" is extended to include "exclusive<->exclusive and preferred<->preferred" scenarios.

3 scenarios are provided for:

A-Side preferred, B-Side preferred: The B-channel is recognized for the A-side. The B-side offers another channel, if available, or releases.

A-Side exclusive, B-Side exclusive: The B-channel is recognized for the A-side. The B-side releases.

A-Side exclusive, B-Side preferred or A-Side preferred, B-Side exclusive: The side of the B-channel marked "exclusive" is recognized as such. The other side offers another B-channel, if available, or releases.

IMPORTANT: This only works if one side is set up as the network and the other is set up as the user (lines with PROTVAR EDSS1NET or EDSS1NETR are regarded as the network side, all other lines are regarded as the user side).

AMO Interrelationships:

TDCSU <B-channel negotiation BCNEG = Y/N>, < Call collision handling CCHDL= ASIDE/BSIDE/NONE >

B-channel negotiations are controlled with the BCNEG parameter. Connections that are set up with "exclusive" are not ready for negotiation. In contrast to this, there are lines that are set up with "preferred", ready for negotiation, and that give priority to exclusive connections.

The parameter BCNEG must be set inversely on the B-channel of the partner system. BCNEG is used to exclude conflict scenarios when a connection is set up. If "BCNEG" is entered, then the trunk is ready for negotiations through the use of another B channel; otherwise the trunk tries to impose the seizure of the B-channel

Device types:

Digital trunks

Protocol variants:

For example, ECMAV2, PSS1V2, EDSS1NET, EDSS1NETR

17.8 BLOC - Signal "end-of-dial" to partner nodes

Feature:

Outgoing digital transmission to network

Function digital Trunks:

To ensure that the "Sending Complete" information element in a setup or information signal is transferred to the partner node, the parameter BLOC must be set in the COT of the trunk in which digital transmission takes place.

"Sending Complete" is only transmitted after the dialed digits reach the number of permitted digits to be transmitted for the specified route.

Function digital Trunks:

An "End of Dialing" Signal will be sent to the partner node. MFC-R2 use the Signal I-15 as EOD Signal. DTMF use # (hash; pound) as EOD signal.

"End of Dialing/EOD" is only transmitted after the dialed digits reach the number of permitted digits to be transmitted for the specified route.

AMO Interrelationships:

IMPORTANT: The parameters TSCS and BLOC must be set in the COT for Q-Sig trunks.

Device types:

Digital CO trunk circuits, interface circuits and tie trunk circuits

For example, SOCOD, S2COD, SOCONN, S2CONN, etc.

Analogue trunk circuits, interface circuits and tie trunk circuits

For example, DIUCQ421, DIUCBRAZ etc.

Protocol variants:

CORNV33 - CorNet protocol

ECMA1 - ECMA QSIG V1 protocol

ECMA1R - ECMA QSIG V1 protocol

ECMAV2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ETSI

ECMAV2R - QSIG ETSI ETS 300 172 3rd. with SS 2nd.

PSS1V2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ISO/IEC

PSS1V2R - QSIG ISO ISO/IEC 11572 2nd. with SS

EDSGER - EDSS1 protocol for Germany

ETSI - Standard EURO-ISDN

EDSS1NET - EDSS1 Net Side protocol

17.9 BRAR - Backward Release (of an incoming CO call)

Backward Release (of an incoming CO call) if a system-initiated recall to the attendant or night station is not answered.

Feature:

Recall after hangup in consultation mode

Transfer an external or internal connection in dialing, calling or busy status when an external connection is waiting

Function:

An externally held incoming consultation connection is released if an **immediate** recall is requested from the consulting partner or if the consulted partner does not answer after transfer in dialing, calling or busy status. The time to release depends on the timer parameter **RELREC** (**Rel**ease **Rec**all). This function can be activated with the COT parameter **BRAR**. It only works with analog trunks.

AMO Interrelationships:

AMO CTIME: < TYPESWU = cptime1 >, < **RELREC**= 90 - 340 sec. >

Device types:

Only for analog trunks

17.10 CDN - Call Deflection network-wide

Feature:

Configure either forward switching or reroute mechanism for CD.

Function:

Is the parameter set, incoming trunk uses reroute mechanism for call deflection.

(to initiate the connection to the CFW destination from node of the originator (subscr. A) and not from the node of the subscriber who diverted (subscr. B)).

Incoming trunk uses forward switching mechanism for call deflection when the parameter is not set..

Hint: CDN has only incoming effect.

AMO-Interrelationships:

None

Device type:

Only digital device

Protocol variants:

Applies to all ISDN protocols.

17.11 CFBN - Call Forward Busy network-wide

Feature:

Configure either forward switching or reroute mechanism for CFB.

Function:

Is the parameter set, incoming trunk uses reroute mechanism for call forward busy.

(to initiate the connection to the CFW destination from node of the originator (subscriber A) and not from the node of the subscriber who diverted (subscriber B)).

Incoming trunk uses forward switching mechanism for call forward busy when the parameter is not set.

Hints:

- CFBN has only incoming effect.
- AULN is not used anymore for CFB!

AMO-Interrelationships:

None

Device type:

Only digital device

Protocol variants:

Applies to all ISDN protocols.

17.12 CFOS - Call forwarding programming for other subscribers

Feature:

Activate and deactivate call forwarding for subscribers by means of the attendant console or station.

Permit remote-control FWD

Block remote-control FWD

Function:

The attendant console (ATND) and subscribers can activate and deactivate variable call forwarding (FWD) for subscribers (FWD object). Any station number in the network is available. Any call numbers that the subscriber has been able to set up as a FWD destination can be designated as the call forwarding destination.

First you must set up the codes for activating (AFWDREM) and deactivating (DFWDREM) the FWD from the ATTND and from the station using the AMO WABE.

In order to permit remote-control FWD from the console and from the station in the network, you must set the CFOS COT parameter. This COT parameter is tested on the link between the ATTND and FWD object both for incoming and

for outgoing digital tie trunks. The link between ATTND and station and FWD object must be set up with LCR.

The ATTND and the station must have FWDFAS rights, otherwise they cannot execute the remote-control FWD. Rights are administered with AMO COS.

AMO Interrelationships:

COS <FWDFAS>, DPLN <DAR=AFWDREM, DAR=DFWDREM>

Device types:

Digital trunks

Protocol variants:

ECMAV2, PSS1V2

17.13 CFTR - Activate, deactivate and check routes for call forwarding in central office

Feature:

Activate, deactivate and check routes for call forwarding in central office

Call forwarding at a main station

Function:

This parameter allows routes for call forwarding in the central office to be activated, deactivated and checked It can be specified for all services and may only be set for Euro ISDN main stations or on the incoming side of digital tie trunks and interface circuits.

The function is only executed if an authorized user enters the order for the FWD object with the PIN administered for this route.

If the parameter is set on the incoming side of a digital tie trunk circuit or interface circuit, then FWDDIR authorization is simulated for the user, irrespective of whether or not the protocol transfers classmarks.

AMO Interrelationships:

FEASU Features in the SWU:

PINNW .... Enable PIN network-wide

CFTR .... For example, Release call forwarding/call forwarding - no answer for voice service

COS Classes of Service:

FWDDIR .... Activate, deactivate and check routes for call forwarding in central office

RICHT Group Trunk Groups to Form Routes:

PIN ... PIN for routes for call forwarding in the central office

Device types:

Digital tie trunk circuits, interface circuits and CO trunk circuits

Protocol variants:

For example:

ECMA1 - ECMA QSIG V1 protocols

ECMA1R - ECMA QSIG V1 protocol

ECMAV2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ETSI

ECMAV2R - QSIG ETSI ETS 300 172 3rd. with SS 2nd.

PSS1V2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ISO/IEC

PSS1V2R - QSIG ISO ISO/IEC 11572 2nd. with SS

EDSGER - EDSS1 protocol for Germany

ETSI - Standard EURO-ISDN

17.14 CFVA - Enable connectivity validation for call forwarding destinations in network

Feature:

Check call forwarding and call forwarding no answer destinations for connectivity during programming

Function:

When programming an external destination for call forwarding or call forwarding no answer, a check is made in the node of the destination to ensure that it can be reached. A signal connection (D channel) to the selected FWD or FNA destination is set up for this purpose.

To ensure that the connectivity check on the FWD or FNA destination is not only carried out locally, but also network-wide, the trunk parameter CFVA must be activated on all outgoing seized trunks - beginning in the source node and ending in the last transit node before the destination node.

IMPORTANT: Trunk parameter CFVA may only be administered on trunks whose protocols, including the message elements for the connectivity check, can be transferred from FWD or FNA targets. For example, the trunk parameters CFVA, **FWDN** and **FNAN** in the OpenScape 4000 must not be set on the network links with external systems without rerouting function for call forwarding, CORNET with HICOM 100, CorNet NQ with ATM, Ethernet, ...MUX... in transfer networks and on the system connection due to undefined T reference point functions (network side).

If the FWD or FNA destination in the remote node can be reached, then the name and classes of service of the FWD or FNA destination are made known in the response to the programming device.

If the signaling line does not reach the FWD or FNA destination because the trunk parameter CFVA is not set on an outgoing tie trunk circuit or interface line to be seized, then the name and class of service of the selected route is sent to the programming device.

IMPORTANT: A diversion destination can be reached if the destination to be checked contains a calling number loden entry, if the class of service FWDBAR (device cannot be programmed as destination for call forwarding or call forwarding if no answer) is deactivated and if the NOCFW switch is set to "NO" in the central system data of the destination node. **A diversion destination can be reached** if the destination to be checked contains a calling number loden entry, is ready to operate and is not in malicious call tracing state, if the class of service FWDBAR (device cannot be programmed as destination for call forwarding or call forwarding if no answer) and do-not-disturb is not activated and if the **NOCFW** switch is set to "**YES**" in the central system data of the destination node.

AMO Interrelationships:

ZAND Central system data

NOCFW	Check the "connectivity" of a FWD or FNA destination when programming

COT Classes of Trunk parameter

FWDN	Enable rerouting for network-wide call forwarding to source node
FNA:	Enable rerouting for network-wide call forwarding to source node

COS Classes of Service:

NOCFW:	No call forwarding. This class of service protects a device from being programmed as the destination for call forwarding.

Device types:

Digital interface circuits and tie trunk circuits

SOCONN, S2CONN

Protocol variants:

Protocols that support a connectivity test for the forwarding destination when programming an FNA/FWD destination via tie trunk circuits:

Protocol variants	Brief description
CORNV2	Cornet protocol
CORNV2R	Cornet protocol
CORNV3	Cornet protocol
CORNV3R	Cornet protocol
CORNV33	Cornet protocol

Protocol variants	Brief description
CORNV33R	Cornet protocol
ECMA1	ECMA QSIG V1 protocol
ECMA1R	ECMA QSIG V1 protocol
ECMAV2	CorNet-NQ Issue 2.1 Dec. 96 Basic ETSI
ECMAV2R	QSIG ETSI ETS 300 172 3rd. with SS 2nd.
PSS1V2	CorNet-NQ Issue 2.1 Dec. 96 Basic ISO/IEC
PSS1V2R	QSIG ISO ISO/IEC 11572 2nd. with SS

17.15 CTLN - Prevent controlled line and trunk selection in an external system

Feature:

Controlled Trunk and Line Selection **CTLS**

Function:

The COT parameter CTLN prevents the controlled selection of trunks and lines for network-wide connections.

After the outgoing seizure of a trunk with the 'Controlled Trunk and Line Selection (CTLS)' feature, continued dialing is prevented if the CTLN COT parameter is activated and the SPCM (speech compression) COT parameter is deactivated in the breakout trunk for the external system.

AMO Interrelationships:

COT: <CTLS, SPCM>; COS<CTLS>; **CTIME**: <CTLS1, CTLS2 >: **DPLN** <CTLS >

Device types:

Digital tie trunk circuits and CO trunk circuits

Network protocols:

For example, ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC)

EDSGER (EDSS1 protocol for Germany), EDSAUT (EDSS1 protocol for Austria), EDSSUI (EDSS1 protocol for Switzerland), EDSFRA (EDSS1 protocol for France), ETSI (Standard EURO-ISDN)

17.16 CTLS - Controlled trunk and line selection network-wide

Feature:

Controlled Trunk and Line Selection **CTLS**

Function:

The COT parameter CTLS enables the controlled selection of trunks and lines for network-wide connections. If the CTLS DAR with the selected call number determined in the DPLN leads to a trunk, this is only seized and the call number is only sent if the COT parameter CTLS is set for the relevant trunk group.

It is only possible to continue dialing after a trunk has been seized if the COT parameters CTLN (prevent controlled line and trunk selection in an external system) or SPCM (speech channel compressed) are not set in the breakout trunk for the OpenScape 4000/HiPath 4000 network.

AMO Interrelationships:

COT: <CLTN, SPCM>; **COS** <CTLS>; **CTIME**: <CTLS1, CTLS2 >, **DPLN**: <CTLS>;

Device types:

Analog line trunks, DIU-CAS line trunks and digital CO trunk circuits or tie trunk circuits

Network protocols:

For example, ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC)

EDSGER (EDSS1 protocol for Germany), EDSAUT (EDSS1 protocol for Austria), EDSSUI (EDSS1 protocol for Switzerland), EDSFRA (EDSS1 protocol for France), ETSI (Standard EURO-ISDN)

17.17 CUG - Release Closed User Groups network-wide

Feature:

Closed User Groups CUG

Function:

An incoming CUG CALL is only rerouted to a partner node if the CUG-related tests have a positive result for the CUG index, for the network identity number and for the interlock code and the trunk to be seized for the external connection setup has corresponding properties.

Parameter CUG must be set in the COT of the trunk to be seized and the administered trunk protocol must be able to transport the CUG service.

Even if the trunk protocol can transport the CUG service, the CUG call is rejected if the CUG parameter is not set on the outgoing trunk to be seized.

AMO Interrelationships:

ZAND branch DOMAIN

DOMTYPE: Type of partner domain for CUG ... DNIC Data network, PRIVATE Private network, TCC Public network

DOMAIN=NO: Partner network identity number (CUG)

TDCSU Digital trunks:

TPROF=NO: CUG profile number of trunk

Device types:

Digital CO trunk circuits, interface circuits and tie trunk circuits

For example, SOCOD, S2COD, SOCONN, S2CONN, etc.

Protocol variants:

ECMAV2 - CorNet-NQ Issue 2.1 Dec. 96 96 Basic ETSI

PSS1V2 - CorNet-NQ Issue 2.1 Dec. 96 96 Basic ISO/IEC

EDSGER - EDSS1 protocol for Germany

ETSI - Standard EURO-ISDN

EDSR8 - EDSS1 Reserve 8 protocol

17.18 DISN - Only display the dialed number on A station display

Feature:

BASA (BahnSignalAnlagen - railway signaling systems) - Change Request E75272 - Correct call number display

Function:

The call numbers displayed while a connection is being established, such as the call number of the actual B station called or registered are not to be displayed on the A station display.

The call number displayed on the A station display should always be the number dialed.

This function can be activated with the COT parameter **DISN**. The parameter is to be set on the breakout trunk seized by station A in an outgoing direction.

Device types:

Digital trunks

Protocol variants:

All protocols that can transfer call numbers

17.19 DSIT - Disconnect Supervision for Incoming Trunk

Feature:

This COT parameter will provide the Disconnect Supervision information for an incoming trunk..

Function:

This parameter reflects the ability of an incoming trunk to signalize the "RELEASE" when it disconnects.

If the trunk has not the capability to signalise the disconnection but this parameter is set to "yes" then the trunk may remain hung.

If the trunk has capability to signalise the disconnection but this parameter is set to "no" then extra code will be executed , the connection can be supervised and some other unpredicted problems can occur.

Hints:

Effect on incoming Direction only

It does not deal with a particular feature / country.

AMO-Interrelationships:

None

Device type:

Analog Trunks. (Digital trunks always provide Disconnect Supervision)

Protocol variants:

Analog

17.20 DTNE - Provide external dial tone to calling system for incoming seizure

Feature:

External dial tone

Function:

If the DTNE parameter is set in the COT of an incoming seized analog trunk, an external dial tone is always fed to the calling node, irrespective of whether the incoming call results in a terminating line or a transit line.

If the DTNE parameter is set in the COT of an incoming seized digital trunk, an external dial tone is fed to the calling node, if the incoming call results in a transit line in the trunk route about which no dialing information has yet been sent for selecting the external destination.

Only one of the COT parameters for the tone types may be set: Either PAR=DTNE ... external dial tone or PAR=NTON ... no tone or PAR=WTINT ... internal dial tone or PAR=VM ... Voice Mail or PAR=ANNC ... local announcement. If this is not followed, then a COT cannot be set up or modified. Error messages F04 or F05 are output.

F04: No parameter value specified for tone type NTON, DTNI, DTNE, VM or ANNC

F05: Only one of the following tone types may be specified: NTON, DTNI, DTNE, VM or ANNC

AMO Interrelationships:

COT Classes of Trunks: Types of tone: NTON, DTNI, VM, ANNC

COP Classes of Parameters: DTN with analog trunks

ZAND Central System Data: SIU ... Assigned SIU tone

Device types:

Analog and digital interface circuits and tie trunk circuits

Protocol variants:

For example:

ANALOG - Protocols for analog trunks

CORNV33 - CorNet protocol

CORNV33R - CorNet protocol

ECMA1 - ECMA QSIG V1 protocol

ECMA1R - ECMA QSIG V1 protocol

ECMAV2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ETSI

ECMAV2R - QSIG ETSI ETS 300 172 3rd. with SS 2nd.

17.21 ETSC - UUS ETSI conform

Feature:

User-to-User Service

EDSS1 System Interface / Trunk Interface

Function:

The ETSC COT parameter can be used to define a virtual network limit for transferring proprietary user-to-user-service message elements (e.g. for CMI Cordless Multicell Integration, NW-CHESE, etc.). Wherever the ETSC COT parameter is set only user-to-user-service message elements are transferred which have been requested in accordance with the ETSI protocol (European Telecommunication Standards). This makes it possible to prevent free user-to-user message elements, as created by CMI, NW-CHESE, etc. for example, from entering the external network. This prevents message backlogs and overloading problems.

AMO Interrelationships:

TDCSU

Device types:

Digital trunks

Protocol variants:

All digital protocol variants that transfer user-to-user message elements, such as CORNV33, ECMAV2, PSS1V2, ETSI, EDSGER, EDSAUT, EDSSUI, EDSFRA

17.22 FAX1 - Call forwarding from incoming FAX CO lines to Phonemail

Feature:

Call forwarding from incoming FAX CO lines to Phonemail if the called fax machine does not respond.

Function:

An incoming fax CO line signaled under ISDN service Fax Group 3 (HLC/LLC High/Low Layer Capability) or from the analog network under the Voice service is forwarded to Phonemail if the called fax machine does not respond (e.g. out of paper).

This causes all calls for a fax machine that can be recognized as faxes to be forwarded after a time if the FAX1 COT parameter is set in the COT of the incoming seized trunk and all parameters required for releasing the call forwarding and deflection features are set.

AMO Interrelationships:

AMO	Key AMO Parameter	Meaning/Information
ZAND	CONANS=YES	Redirection for trunk calls only
COT	PAR=... FAX1, FNAN (forward rerouting data) PAR=...TSCS	Class of Trunk for the incoming trunk interfaces Class of Trunk for all tie trunk circuits
RICHT	MODE=PM . . Data for Phonemail, IDX= ..., FAXO= ... Fax overflow, SAN= ... Service Access Number for Phonemail	Make entries in the service access Table for each OpenScape 4000 in the network
CTIME	FAXOFLPM	Define FAX overflow time to Phonemail

In the case of Group 3 fax machines which are accessed from external subscribers and under the Voice service, it is necessary to use the AMO DIALCONV to set up a second call number which is then converted to the actual call number by means of the FAX service.

For OpenScape 4000 network configurations with internal subscribers outside of the home PBX of the Xpressions450 it should be noted that mailbox access must be set up for each OpenScape 4000 system by means of the AMO RICHT with parameter MODE=PM and that the transfer of Message Waiting Indication messages is enabled via Temporary Signaling Connections in all tie trunk circuits by means of the TSCS parameter in the AMO COT.

Device types:

Analog and digital CO trunk circuits, interface circuits and tie trunk circuits

Protocol variants:

For example:

CORNV33, ECMAV33 (CorNet-NQ Issue 2.2 Dec.1 Basic ETSI), PSS96V1 (CorNet-NQ Issue 2.2 Dec.1 Basic ISO/IEC), Euro-ISDN

17.23 FAX2 - Call forwarding from incoming FAX CO lines to Phonemail

Feature:

Call forwarding from incoming FAX CO lines to Phonemail if the called fax machine is busy.

Function:

An incoming fax CO line signaled under ISDN service Fax Group 3 (HLC/LLC High/Low Layer Capability) or from the analog network under the Voice service is forwarded to Phonemail if the called fax machine is busy.

This causes all calls for a fax machine that can be recognized as faxes to be forwarded immediately if the FAX2 COT parameter is set in the COT of the incoming seized trunk and all parameters required for releasing the call forwarding and deflection features are set.

AMO Interrelationships:

AMO	Key AMO Parameter	Meaning/Information
ZAND	COBUSY=YES	Call forwarding for trunk calls when station busy
COT	PAR=... FAX2, FWDN (forward rerouting data) PAR=...TSCS	Class of Trunk for the incoming trunk interfaces Class of Trunk for all tie trunk circuits
RICHT	MODE=PM .. Data for Phonemail, IDX= ..., FAXO= ... Fax overflow, SAN= ... Service Access Number for Phonemail	Make entries in the service access Table for each OpenScape 4000 in the network

In the case of Group 3 fax machines which are accessed from external subscribers and under the Voice service, it is necessary to use the AMO DIALCONV to set up a second call number which is then converted to the actual call number by means of the FAX service.

For OpenScape 4000 network configurations with internal subscribers outside of the home PBX of the Xpressions450 it should be noted that mailbox access must be set up for each OpenScape 4000 system by means of the AMO RICHT with parameter MODE=PM and that the transfer of Message Waiting Indication messages is enabled via Temporary Signaling Connections messages in all tie trunk circuits by means of the TSCS parameter in the AMO COT.

Device types:

Analog and digital CO trunk circuits, interface circuits and tie trunk circuits

Protocol variants:

For example, CORNV33, ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC), Euro-ISDN

17.24 FNAN - Enable rerouting for network-wide forwarding on no answer to source node

Feature:

Network-wide forwarding on no answer (FNA)

Call Deflection (CD) - call forwarding during the ringing phase

Function:

The FWDN parameter is used in the COT of a trunk on the one hand to deactivate the return point for executing network-wide call forwarding and, on the other, to release rerouting for network-wide call forwarding to the source node. This applies to network-wide call forwarding that can arise from an A-B connection or from a consultation line prior to transfer.

If the FWDN parameter is set in the incoming, seized trunk of the B node or in the incoming seized trunk of a transit node, then the update or connection data is forwarded to the next node for execution of call forwarding until a node is found in the network which undertakes the activities for returning cell forwarding in a forward direction. This can be either a transit node or the source node.

If the FWDN parameter is not set in the incoming seized trunk of the B node or in the incoming seized trunk of a transit node, then no update or connection data for executing call forwarding is forwarded to the next node. The trunk becomes the return point and takes on the control activity for the subsequent connection setup for network-wide call forwarding to the FWD destination and ensures the forward release of the connection to the B subscriber.

The FWDN parameter should also be set as standard for the outgoing seized trunks that are seized while a connection is being set up between a calling node, a called node and the intermediate transit node, provided that the network protocols permit rerouting for call forwarding. This is how rerouting works for call forwarding from node B to node A and vice verse.

IMPORTANT: Trunk parameter FWDN must not be set on the digital network interface points from a OpenScape 4000 to older Hicom 300 variants and to external systems that do not support this function!

Cell Deflection (CD) - call forwarding during the ringing phase

The CD LM allows a subscriber to deflect incoming connections to a different connection during call signaling - after CD has been activated.

The COT parameter FNAN is used to determine whether the service is released on the relevant trunk and whether the external system has implemented the service.

IMPORTANT: Trunk parameters **FWDN**, **FNAN** and **CFVA** must not be set, for example, in OpenScape 4000 with network

couplings with external systems without rerouting function for call forwarding on no answer, CORNET with HICOM 100, CorNet NQ with ATM, Ethernet,....MUX... in transfer networks, on the system connection due to undefined T reference point functions (network side).

AMO Interrelationships:

COT Classes of Trunks:

FWDN: Enable rerouting for network-wide call forwarding to source node

NCTP: The partner node cannot execute network-wide call forwarding after transfer

CFVA: Network-wide connectivity test for forwarding destination when programming an FNA/FWD forwarding destination via tie trunk circuits

Device types:

Digital CO trunk circuits, interface circuits and tie trunk circuits

For example, SOCOD, S2COD, SOCONN, S2CONN, etc.

Protocol variants:

Protocols that support rerouting for network-wide call forwarding to the source node:

Protocol variants	Brief description
CORNV2	Cornet protocol
CORNV2R	Cornet protocol
CORNV3	Cornet protocol
CORNV3R	Cornet protocol
CORNV33	Cornet protocol
CORNV33R	Cornet protocol
ECMA1	ECMA QSIG V1 protocol
ECMA1R	ECMA QSIG V1 protocol
ECMAV2	CorNet-NQ Issue 2.1 Dec. 96 Basic ETSI
ECMAV2R	QSIG ETSI ETS 300 172 3rd. with SS 2nd.
PSS1V2	CorNet-NQ Issue 2.1 Dec. 96 Basic ISO/IEC
PSS1V2R	QSIG ISO ISO/IEC 11572 2nd. with SS
EDSGER	EDSS1 protocol for Germany
ETSI	Standard EURO-ISDN

17.25 FWDN - Release rerouting for network-wide call forwarding to source node

Feature:

Network-wide call forwarding (FWD)

Follow-me with network-wide PIN

Function:

The FWDN parameter is used in the COT of a trunk on the one hand to execute network-wide call forwarding and, on the other, to release rerouting for network-wide call forwarding to the source node. This applies to network-wide call forwarding that can arise from an A-B connection or from a consultation line prior to transfer.

If the FWDN parameter is set in the incoming, busy trunk of the called node or in the incoming busy trunk of a transit node, then the update or connection data is forwarded to the next node for execution of call forwarding until a node is found in the network which undertakes the activities for returning call forwarding in a forward direction. This can be either a transit node or the source node.

If the FWDN parameter is not set in the incoming busy trunk of the called node or in the incoming busy trunk of a transit node, then no update or connection data for executing call forwarding is forwarded to the next node. The trunk becomes the return point and takes on the control activity for the subsequent connection setup for network-wide call forwarding to the FWD destination and ensures the forward release of the connection to the B station.

The FWDN parameter should also be set as standard for the outgoing busy trunks that are seized while a connection is being set up between a calling node, a called node and the intermediate transit nodes, provided that the network protocols permit rerouting for call forwarding. This is how rerouting works for call forwarding from node B to node A and vice versa.

IMPORTANT: Trunk parameter FWDN must not be set on the digital network interface points from a OpenScape 4000 to older Hicom 300 variants and to external systems that do not support this function!

IMPORTANT: Trunk parameters FWDN, FNAN and CFVA may not be set, for example, in OpenScape 4000 with network couplings with external systems without rerouting function for call forwarding, CORNET with HICOM 100, CorNet NQ with ATM, Ethernet, ...MUX... in transfer networks and on the system connection due to undefined T reference point functions (network side).

AMO Interrelationships:

COT Classes of Trunks:

FNAN: Enable rerouting for network-wide call forwarding to source node

FWDR: Call deflection to public CO via rerouting (France)

CFVA: Network-wide connectivity test for forwarding destination when programming an FNA/FWD forwarding destination via tie trunk circuits

Device types:

Digital CO trunk circuits, interface circuits and tie trunk circuits

For example, SOCOD, S2COD, SOCONN, S2CONN, etc.

Analog networking interface circuits and tie trunks

For example, MAINEM, SATEM

Protocol variants:

Protocols that support rerouting for call forwarding to the source node in the network:

Protocol variants	Brief description
ANALOG	Protocols for analog trunks
CORNV2	Cornet protocol
CORNV2R	Cornet protocol
CORNV3	Cornet protocol
CORNV3R	Cornet protocol
CORNV33	Cornet protocol
CORNV33R	Cornet protocol
ECMA1	ECMA QSIG V1 protocol
ECMA1R	ECMA QSIG V1 protocol
ECMAV2	CorNet-NQ Issue 2.1 Dec. 96 Basic ETSI
ECMAV2R	QSIG ETSI ETS 300 172 3rd. with SS 2nd.
PSS1V2	CorNet-NQ Issue 2.1 Dec. 96 Basic ISO/IEC
PSS1V2R	QSIG ISO ISO/IEC 11572 2nd. with SS
EDSGER	EDSS1 protocol for Germany
ETSI	Standard EURO-ISDN

17.26 ITRN - Internal traffic restriction group (ITR) network-wide

Feature:

Intercept to attendant console (ATND), determine company name in calls to attendant console (ATND), block connections

Function:

The parameter only works with incoming messages but not with outgoing messages. When this parameter is set, the value of the Internal Traffic Restriction group (ITR) is not taken from the transferred protocol, but rather from the corresponding trunk for the further processing of ITR-related features (SETUP -> in the case of the incoming seized trunk, ALERT, CONNECT, DISCONNECT etc. -> in the case of the outgoing seized trunk).

Irrespective of whether the ITRN parameter is active or inactive, the ITR group of the trunk is used even if the protocol transfers no ITR group.

AMO Interrelationships:

ITRGR, TACSU, TDCSU

Device types:

Digital trunks

Protocol variants:

For example, CORNV33, ECMAV2, PSS1V2

17.27 KNDI - Camp-on in DID calls (TC and TT)

Feature:

Automatic camp-on in DID calls

General announcement for automatic camp-on

Function:

The KNDI parameter can be used to activate or deactivate the "Automatic Camp-on at a Busy Voice Terminal" feature in the node in the case of DID trunk calls.

Camp-on takes place at voice terminals if these devices are not protected against camp-on or overriding and if the Free to Knock/Camp-on feature is activated.

When camping on to a DIGITE, a camp-on is signaled visually on the free background subunit and is limited by the CP timer setting KNLEN.

After the timer has expired, the connection to the exchange or night terminal is discarded.

AMO Interrelationships:

AMO	Key AMo Parameter	Meaning/Information
FEASU	FRKN RKNOVR	Free to knock for digital stations Free the Knock/Camp-on feature
COT	PAR=... ANAT&KNDI..	Class of trunk of the calling trunk Announcement with camp-on

AMO	Key AMo Parameter	Meaning/Information
CTIME	KNLEN	Length of knocking signal for DID calls from CO

Device types:

Analog and digital CO trunk circuits, interface circuits and tie trunk circuits

For example, DP, MAINVFSS, SATVFSS, SATLPNW, SOCOD, S2COD, SOCONN, S2CONN

Protocol variants:

All trunk protocols that can signal DID trunk calls on a network wide basis

For example:

ANALOG - Protocols for analog trunks

ETSI - Standard EURO ISDN

EDSGER - EDSS1 protocol for Germany

CORNV33 - CorNet protocol

ECMAV2 - CorNet-NQ Issue 2.1 Dec.96 Basic ETSI

PSS1V2 - CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC

17.28 KNOR - Knocking override possible

Feature:

"Network-wide override/camp-on" feature

"Manual override for 40 seconds" feature

"Emergency override/forced hold" feature

Function:

The KNOR COT parameter is used to enable "override and camp-on specific features" throughout the network.

KNOR set: The activation signal for executing the "override/camp-on in network" function is forwarded to the next node. The activities for executing the feature are delegated to the partner node.

COT parameter KNOR should be set on all relevant trunk interfaces throughout the network, in which override/ camp-on should be enabled.

KNOR not set: The activation signal for executing the "override/camp-on in network" function is not forwarded to the next node. The feature is already rejected in the user's own node.

IMPORTANT: The IBSY (intercept when busy) parameter must not be set on main system trunks if KNOR (trunk with knocking/ override) is set in the remote station.

AMO Interrelationships:

COT Classes of Trunks:

NOVC ... No override on CO connections

ZAND Central System Data:

ALLDATA/ ATA - 'Override' group .... e.g. OVRMST Override in multiple states

FEASU Features in the SWU:

OVR .... A station with override/camp-on authorization can override/camp-on at a busy station terminal during a call

FRKN .... Free to knock for digital stations

SDAT Administration of station-based features and general, non-device-dependent station data:

Overrider: OVR .... Knocking override and KN Knocking/call waiting

Knocking override destination: RKNOVR .... Override/camp-on rejection may not be set

COS Classes of Service:

AUTOV .... Automatic override, China

RKOABS .... Reject knocking/override absolute may not be set for the override/knocking destination

Device types:

Analog networking trunks: For example, SATLPNW, MAINVFSS, SATVFSS, ITT2, ITT4, ITTIC, MAINEM, SATEM

Digital tie trunk circuits and interface circuits: For example, SOCONN, S2CONN

Protocol variants:

For example, ANALOG, CORNV33, ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC)

17.29 LINC - Handling implicit numbers when connecting to a carrier

Feature:

Display modification

LINC enables the handling of E164 numbers between OpenScape 4000 carrier and customer systems without KNMAT entries.

Function:

The LINC parameter identifies OpenScape 4000 carrier systems of customer systems by means of which only implicit numbers without breakout code (e.g. 089 722-4711 or just 4711) as sent as calling numbers.

IMPORTANT: The "Calling Number" refers to every number that is not the "Called Number" (e.g. the number of subscriber A, the

number of the answering subscriber, the number of the diverting subscriber, etc.).

On the incoming side all numbers are transformed by the LINC COT into an implicit format of ISDN numbering plan E164 with NPI=ISDN and TON=UNKNOWN. KNFOR entries on the customer system are ignored.

On the outgoing side, the calling number is transformed to the format set in KNFOR (node format table) and expanded with the prefixes from the KNDEF (e.g. 89 722-4711 -> e.g. 089 722-4711).

In the trunk to the customer the ISDN prefixes must be entered with the AMO TDCSU of the relevant customer and the ISDN codes must be entered in the AMO KNDEF!

IMPORTANT: A customer system may not send a calling number as the subscriber number (e.g. 722-4711) if the COT parameter LINC is set because this number cannot be distinguished from an extension number, e.g. 7221. Permitted for the calling number: - 0049 89 722 4711 - 089 722 4711 - 4711

AMO Interrelationships:

AMO TDCSU:	Set up prefixes for NPI=ISDN with the parameters ISDNIP and ISDNNP
AMO KNPRE:	Set the node prefix table with the parameters BREAKOUT, PREFIX, etc.
AMO KNFOR:	Set up a node format table with the parameters DNNO= ... , NPI=ISDN, TON=...
AMO KNDEF:	Set up a node number table with the parameters DNNO= ... , ISDNCC, ISDNAC, ISDNLC, etc.

IMPORTANT: LINC and LIRO may not be set at the same time.

IMPORTANT: LINC and LIRO may not be set at the same time.

Device types:

Digital tie trunk circuits

Network protocols:

For example, ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC)

17.30 LINO - Line with implicit number

Feature:

Display modification

Function:

The COT parameter LINO should always be used if old systems or external systems only understand implicit, i.e. dialable, calling numbers and return an undefined or incorrect NPI/TON combination for a sent number. Because, in practice, this cannot be ascertained without major effort, it is recommended that the LINO should be used as standard in the COT or trunks for old systems or external systems.

LINO applies to both incoming and outgoing lines. On the incoming side, the NPI and TON of each calling number is overwritten with UNKNOWN as standard. On the outgoing side, LINO causes all calling numbers with the breakout code and NPI = UNKNOWN and TON = UNKNOWN to be transferred.

The LINO parameter may not be set for CO trunk circuits.

If an explicitly signaled, external node (e.g. trunk) can be reached by means of a trunk with this number, then an entry for this node must exist with AMO KNFOR.

However, if a KNFOR entry (NPI = ISDN or Private) exists for the same route from which the LINO was set, then LINO is ignored and the display modification is controlled with NPI and TON of the incoming signal.

IMPORTANT: The "Calling Number" refers to every number that is not the "Called Number" (e.g. the number of subscriber A, the number of the answering subscriber, the number of the diverting subscriber, etc.). NPI ... Numbering Plan Identifier), TON .... Type Of Number

---

AMO Interrelationships:

IMPORTANT: LINO and LINC may not be set together!

AMO KNFOR Set up node format table: <DNNO= ... , NPI=ISDN, TON=...>

Device types:

Digital tie trunk circuits

Network protocols:

For example, ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC)

17.31 LPRN - Permanent station number suppression for EDSS1 CO

Feature:

Display suppression

Function:

COT parameter LPRN - Line With Permanent Restricted Numbers - can be used to activate permanent number suppression on a breakout trunk for an EDSS1 CO for all outgoing D channel signals - irrespective of any terminal-specific generations.

The LPRN function applies to Basic Call, Call Diversion and explicit Call Transfer, as well as the service elements CLIR (Calling Line Number Identification Restriction) and COLR (Connected Line Number Identification Restriction).

Device types:

Digital CO trunk circuits

Network protocols:

For example, EDSGER (EDSS1 protocol for Germany), EDSAUT (EDSS1 protocol for Austria), EDSSUI (EDSS1 protocol for Switzerland), EDSFRA (EDSS1 protocol for France), ETSI (Standard EURO-ISDN)

17.32 LRPM - Line to Phonemail

Feature:

Call forwarding/call forwarding when no answer/forwarding when busy to a Phonemail

Function:

The parameter LRPM identifies lines for a Phonemail server and also controls whether the number of the first or last forwarding party is sent in the seizure signal to the Phonemail server when there are multiple forwards with the ZAND parameter FWDVMS1 .

LRPM set and ZAND parameter FWDVMS1=NO: The number of the last forwarding party is sent to the Phonemail in the seizure signal

LRPM set and ZAND parameter FWDVMS1=YES: The number of the first forwarding party is sent to the Phonemail in the seizure signal

The number of the first forwarding party is always sent in the seizure signal to the Phonemail in the case of the remaining LRPM FWDVMS1 combinations.

AMO Interrelationships:

AMO ZAND:	FWDVMS1=yes ..	Call forwarding to the VMS of the called subscriber
	FWDVMS1=no ..	Call forwarding to the VMS of the last forwarding destination

Device types:

Digital tie trunk circuits and interface circuits:

Network protocols:

CORNV33 ... CorNet-N issue 1.3f

17.33 MFCL - Line with MFC (Multi-Frequency Code) signaling

Feature:

MFC-R2 signaling/country connection technology

Function:

In the case of analog line trunks operated with MFC signaling, such trunks of the MFCL parameter are to be set in the seized trunk parameter classes. This applies to both the calling and called line side.

AMO Interrelationships:

COT Configure Parameter Classes:

TIEI	Identification of tie trunk circuit (MFC)
ATDI	Identification of attendant ATTND (MFC)

MFCTA Edit MFC Tables:

The MFCVAR parameter is used to seize an MFC table for a trunk

TACSU Configure Analog Trunks:

MFCVAR	.... MFC variant

IMPORTANT: When setting up an MFC trunk, only a value greater than 0 can be entered as the MFC variant. Otherwise error message F37 "If MFCVAR = 0, trunk parameter MFCL may not be entered (AMO COT)" is displayed. If the MFC variant = 0 (trunk is operated with dial pulsing) is assigned, trunk parameter MFCL should not be entered.

DIALTYPE	.... dialing type for incoming and outgoing traffic

IMPORTANT: If MFC (multifrequency code) or DIPA (dial pulsing with ANI - automatic number identification) is entered for the incoming and/or outgoing dialing type, then a value greater than 0 must be administered for MFCVAR.

Device types:

Analog trunks with MFC signaling, e.g. ICF, ICLLP, ICLFB, ICLIB

17.34 MICC - MCID call clearing control required

Feature:

DSS 1 Terminals, MCID Malicious Call Identification (trace, identify malicious callers)

Function:

If a call is to be registered on a network-wide basis and if the connection line contains a DSS1 gateway, then the COT parameter MICC must be set on the DSS1 gateway (user side). This enables a network-wide call registration to be carried out after clearing.

AMO Interrelationships:

COS Classes of Service:

MCIDM: Class of service for activating the registration of an incoming call during the call and immediately after cleardown. This can be activated by means of the functional DSS1 protocol or by means of the TRACE digit analysis result.

TRACE: This class of service must be set together with the MCIDM class of service so that all incoming calls can be registered automatically. Additional manual registration is not possible.

MCIDA: Automatic registration of ringing malfunctions; the subscribers in question are calling subscribers that release before a call connection is established.

Device types:

Digital trunks

Protocol variants:

For example, EDSGER (EDSS1 protocol for Germany), EDSAUT (EDSS1 protocol for Austria), EDSSUI (EDSS1 protocol for Switzerland) EDSFRA (EDSS1 protocol for France)

17.35 MIIH - Make MCID here, print out MCID locally

Feature:

DSS 1 Terminals, MCID Malicious Call Identification (trace, identify malicious callers)

Function:

If network-wide registration is activated, then it is possible to activate registration in a network node by setting COT parameter MIIH. When the parameter is set, the request to register a call is no longer forwarded in the direction of the source node.

AMO Interrelationships:

COS Classes of Service:

MCIDM: Class of service for activating the registration of an incoming call during the call and immediately after cleardown. This can be activated by means of the functional DSS1 protocol or by means of the TRACE digit analysis result.

TRACE: This class of service must be set together with the MCIDM class of service so that all incoming calls can be registered automatically. Additional manual registration is not possible.

MCIDA: Automatic registration of ringing malfunctions; the subscribers in question are calling subscribers that release before a call connection is established.

Device types:

Digital trunks

Protocol variants:

For example, EDSGER (EDSS1 protocol for Germany), EDSAUT (EDSS1 protocol for Austria), EDSSUI (EDSS1 protocol for Switzerland) EDSFRA (EDSS1 protocol for France)

17.36 MLPR - Multi-level precedence and preemption

Feature:

Trunk can be used for MLPP.

Function:

The trunk may be disconnected by MLPP in line with protocol if it is seized by MLPP routine or a higher routine and is required for an even higher level. It is not disconnected if the trunk is seized by a non-MLPP call.

MLPR (not set): Trunk may not be disconnected by MLPP Calls.

IMPORTANT: MLPR - For outgoing traffic only.

AMO Interrelationships:

The parameters MLPR and NMLT can be set independently of each other and independently of the MLPP release in FEASU.

MLPR and NMLT only work if the MLPP feature is released in FEASU.

If MLPR is set for the trunk, then NATL or NATR may not be set at the same time.

The introduction of MLPR and NMLT means that the PAR CCAL can be omitted.

Device types:

Trunks with Voice service

Protocol variants:

All protocols

17.37 NAAT - North America Analog Trunks

Feature:

If a Trunk release different way of Release for US and Rest of World-Trunks

Function:

NAAT is set, so release is like US type.

NAAT is not set, so release is like Rest of World (IM market).

IMPORTANT: Must be set for all analog US trunks.

AMO-Interrelationships:

None

Device type:

TMEMUS,TMDID,TMC16,TMDN64

Protocol variants:

PLAR, HOOT & HOLLER,E & M Protocol

17.38 NCT - Network Call Transfer

Feature:

NCT (Network Call Transfer), enables the Network Call Transfer (NCT) feature on an PRI B-channel group.

Function:

This parameter will be set when the Feature Network Call Transfer (also called Explicit Call Transfer) is requested by the customer. NCT enables the MCI-NCT feature on an MCI PRI B-channel group.

Hints:

This feature is currently only supported by selected US Public PRI protocols.

If a trombone connection occurs on the same B-Channel group, NCT can be invoked to transfer to call to the Public Network, but only if this COT is set.

NCT is a separate feature defined in MCI protocol specification.

AMO-Interrelationships:

None

Device type:

Only applies to ISDN trunks (US and IM).

Protocol variants:

Applies currently only to US PRI protocols from MCI.

17.39 NCTP - Partner node cannot execute network-wide call forwarding after transfer

No Call Forwarding no Reply after Transfer Possible

Feature:

Network-wide call forwarding after transfer of a waiting line to a free terminal

Function:

The parameter NCTP can be used to set the return point for executing call forwarding after transfer of a waiting connection in the COT of a line.

If the parameter is set, no update or connection data for executing call forwarding after transfer is forwarded to the next node. The NCTP trunk becomes the return point and assumes the control activity for the subsequent connection setup for call forwarding between the waiting connection and the new connection to be called and the original connection called.

This parameter is to be set at the digital network interface points of an OpenScape 4000 for old Hicom 300 variants and for external systems that do not support this function. It only applies to the feature described.

IMPORTANT: The trunk parameters FWDN (call forwarding network-wide) and FNAN (call forwarding no answer network-wide) do not affect the function of the NCTP parameter.

Device types:

All digital interface circuits that are connected in the group of Hicom 300 variants of software level < Hicom 300 E V3.0

All CO trunk circuits that do not support this function

17.40 NIN2 - No multi-level precedence and preemption on trunk

Feature:

In order to ensure the full functionality of calls to the central attendant console (CAS_EXTern) in a mixed network of OpenScape 4000 systems with older Hicom 300 systems.

Function:

Parameter set (do not send a CINT LEG 2 operation): In the case of the outgoing CAS EXTernal call signaling, no service intercept operation with LEG2 information is sent; instead the parameter is transferred in accordance with CorNet-N.

IMPORTANT: Not to be set in the OpenScape 4000/HiPath 4000 homogenous network.

The parameter works in an outgoing direction.

The value for the COT parameter must be set for outgoing digital tie trunk circuits for Hicom 300 systems.

AMO Interrelationships:

None

Device types:

For digital trunks only (centralized attendant console)

Protocol variants:

CorNetNQ

17.41 NITO - No intercept in networking transit lines

Feature:

Suppress override signals to the attendant console or to the subsequent station in networking transit lines

Function:

If the NITO parameter is set in the COT of an outgoing seized transit trunk, then all intercept signals are suppressed on the incoming seized transit trunk, irrespective of whether any intercept parameters are set in the COT of the incoming seized trunk. The function is only executed if the trunks involved in the transit connection are networking trunks.

AMO Interrelationships:

AMO	Key AMO parameters		Meaning/information
COT	in incoming seized trunk	in outgoing seized trunk	Transit connection
	IDND	NITO	No intercept, incoming trunk initiates release
	IDND		Intercept to ATND during do-not-disturb
	IBSY	NITO	No intercept, incoming trunk initiates release
	IBSY		Intercept to ATND if busy
	IFR	NITO	No intercept, incoming trunk does not initiate release, but continues to call
	IFR		Intercept to ATND when free (after timeout)
	ITB	NITO	No intercept, incoming trunk initiates release
	ITB		Intercept to ATND when all trunks busy
	INAU	NITO	No intercept, incoming trunk initiates release

AMO	Key AMO parameters		Meaning/information
	INAU		Intercept to ATND when an unauthorized terminal has been selected
	IVAC	NITO	No intercept, incoming trunk initiates release
	IVAC		Intercept to ATND if the selected call number does not exist
FEASU	ICPTDID		Release "Intercept DID trunk calls" feature

Device types:

Analog networking trunks:

For example, MAINEM, SATEM

Digital CO trunk circuits, interface circuits and tie trunk circuits

For example, SOCOD, SOCONN, S2COD, S2CONN

Protocol variants:

For example:

ANALOG - Protocols for analog trunks

CORNV33 - CorNet protocol

ECMAV2 - CorNet-NQ Issue 2.1 Dec.96 Basic ETSI

PSS1V2 - CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC

Euro-ISDN protocols

17.42 NLCR - Partner system sends no LCR authorizations in Voice or Fax service

Feature:

LCR Least Cost Routing

For example, performing switching with E.164 numbering plan in network

Function:

If the COT of a trunk of parameter NLCR is set, then the LCR authorizations sent by the partner system are replaced by the LCR authorizations generated on the trunk.

If the parameter is not set, then the LCR authorizations are applied from the transferred protocol. If a protocol does not transfer any LCR authorizations, then the LCR authorizations of the trunk are always applied, irrespective of whether the NLCR parameter is activated or deactivated.

NLCR refers to the LCR class of service assigned to a trunk when generated with the parameter "LCOSV ... LCR class of service for voice, fax".

IMPORTANT: At present, CORNV33 and CorNet-NQ are the only protocols that transfer LCR authorizations.

AMO Interrelationships:

COT:	NLRD	Partner system sends no LCR authorizations in the Data service
TACSU, TDCSU:	LCOSV	... LCR class of service for voice, fax

Device types:

Analog and digital tie trunk circuits, interface circuits and CO trunk circuits

Protocol variants:

For example,

ANALOG	Protocol for analog trunks
CORNV33	CorNet protocol
ECMAV2	CorNet-NQ Issue 2.1 Dec. 96 96 Basic ETSI
PSS1V2	CorNet-NQ Issue 2.1 Dec. 96 Basic ISO/IEC

17.43 NLHT - No local hold tone, hold tone sent by remote system

Feature:

No local hold tone for consultation, toggling and transfer

Function:

If a local hold tone is not to be sent to the waiting external network partner in the cases of the toggle, consultation or unscreened transfer features, then the NLHT parameter should be set on the trunk on hold The parameter operates on the basis of trunks, i.e. the parameter status of NLHT both for incoming trunk seizure and outgoing trunk seizure is stored as an attribute in the connection memory, making it available to all partners, e.g. for consultation, toggling and transfer.

AMO Interrelationships:

VOICO Configure Voice Compression, COT: <SPCM>

Device types:

Analog and digital CO trunk circuits and tie trunk circuits

Protocol variants:

All protocols

17.44 NLRD - Partner system sends no LCR authorizations in the Data service

Feature:

LCR Least Cost Routing

Function:

If the COT of a trunk of parameter NLRD is set, then the LCR authorizations sent by the partner system are replaced by the LCR authorizations generated on the trunk.

If the parameter is not set, then the LCR authorizations are applied from the transferred protocol.

If a protocol does not transfer any LCR authorizations, then the LCR authorizations of the trunk are always applied, irrespective of whether the NLRD parameter is activated or deactivated.

NLCD refers to the LCR class of service assigned to a trunk when generated with the parameter "LCOSD ... LCR class of service for data".

IMPORTANT: At present, CORNV33 and CorNet-NQ are the only protocols that transfer LCR authorizations.

AMO Interrelationships:

COT:	NLCR	-Partner system sends no LCR authorizations in Voice service
TACSU, TDCSU:	LCOSD	... LCR class of service for data

Device types:

Analog and digital tie trunk circuits, interface circuits and CO trunk circuits

Protocol variants:

For example, ANALOG, CORNV33, ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC)

17.45 NMLT - No multi-level precedence and preemption on trunk

Feature:

Suppression of incoming and outgoing MLPP information.

Function:

If MLPP is released in FEASU, then MLPP information is carried via all system trunks, provided that this is permitted by the signaling procedures used.

This transport can be blocked for certain trunks by setting NMLT.

NMLT (not set): Trunk carries MLPP information.

IMPORTANT: NMLT - applies to outgoing and incoming traffic.

AMO Interrelationships:

The parameters MLPR and NMLT can be set independently of each other and independently of the MLPP release in FEASU.

MLPR and NMLT only work if the MLPP feature is released in FEASU.

If MLPR is set for the trunk, then NATL or NATR may not be set at the same time.

The introduction of MLPR and NMLT means that the PAR CCAL can be omitted.

Device types:

Trunks with Voice service

Protocol variants:

All protocols that transmit MLPP-related information

17.46 NOFT - No Flag Trace

Feature:

Flag trace

Network-wide trace stop

Dynamic flag trace by means of digital analysis result (DAR) dialing

Function:

The flag trace allows a connection to be traced network wide in CP (Call Processing) and DH (Device Handler).

The COT parameter NOFT can be used to suppress the receiving and sending of flag trace and trace stop information on digital trunks.

Flag trace or trace stop information received on a trunk marked with NOFT leads to the immediate clearing of the incoming connection because it is like an attempted "tapping".

The digital analysis result DAR=FLTRACE, dynamic flag tracing network-wide is only effective if the COT parameter <NOFT> is not set.

AMO Interrelationships:

TACSU, TDCSU, DPLN DAR=FLTRACE.... the digital analysis result "dynamic flag tracing" can be set up for both analog and digital trunks, TRACS

Device types:

Analog and networking trunks

Protocol variants:

The flag trace feature is only fully supported by protocol variants ECMAV2 and PSS1V2.

17.47 NOHO - No Hold for NW Conference

Feature:

Interfacing with CorNet-N and CorNet-NQ of version HV1.0 UK or older.

Function:

Parameter is set: Assume Switch A has a Conference and Switch B has Station 1. A member of the Conference adds Station 1. If the Conference is listening to Music On Hold or Ringback because Station 1 has placed the Conference on Hold, Transfer or Consult then SET this parameter. Also, if this parameter is SET then Station 1 can not place the Conference on Hold, Transfer or Consult.

Parameter is not set: Assume Switch A has a Conference and Switch B has Station 1. A member of the Conference adds Station 1. If this parameter is NOT SET then Station 1 can place the Conference on Hold, Transfer or Consult.

Hints:

- In terms of CorNet-N/CorNet-NQ message flow then is OUTGOING
- In terms Calls originating in or out of the Switch then is BOTHWAY.

AMO-Interrelationships:

None

Device type:

Digital CorNet-N and CorNet-NQ trunks.

Protocol variants:

CorNet-N and CorNet-NQ (Service Voice)

17.48 NORR - No rerouting with LCR

Feature:

LCR rerouting

Function:

COT parameter NORR can also be used to influence the LCR rerouting administered by the AMOs RICHT and LDAT during an outgoing trunk seizure.

If the NORR parameter is set in the COT of a trunk, then LCR rerouting is generally deactivated for outgoing seizures of a trunk and the functions of the TGRE COT parameter - control LCR rerouting on the basis of cause values - are ignored.

If, on the other hand, the NORR is not set in the COT of a trunk, LCR rerouting is always carried out for outgoing seizures of a trunk and the functions of the COT parameter TGRE - control LCR rerouting on the basis of cause values - are taken into account.

IMPORTANT: An outgoing seized analog tie trunk circuit or trunk which does not receive an analyzed dialing party from the partner system is through-connected if the NORR parameter is

set. For this reason, the NORR parameter should always be set for these trunk types if LCR rerouting is administered.

AMO Interrelationships:

COT Class of Trunk

TGRE - Control LCR rerouting the basis of cause values

Device types:

Analog and digital CO trunk circuits, interface circuits and tie trunk circuits

For example, SOCOD, S2COD, SOCONN, S2CONN - MOSIG Main station code, DP Dial pulse code

Protocol variants:

ANALOG - Protocols for analog trunks

CORNV33 - CorNet protocol

CORNV33R - CorNet protocol

ECMA1 - ECMA QSIG V1 protocol

ECMA1R - ECMA QSIG V1 protocol

ECMAV2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ETSI

ECMAV2R - QSIG ETSI ETS 300 172 3rd. with SS 2nd.

PSS1V2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ISO/IEC

PSS1V2R - QSIG ISO ISO/IEC 11572 2nd. with SS

EDSGER - EDSS1 protocol for Germany

ETSI - Standard EURO-ISDN

EDSS1NET - EDSS1 Net Side protocol

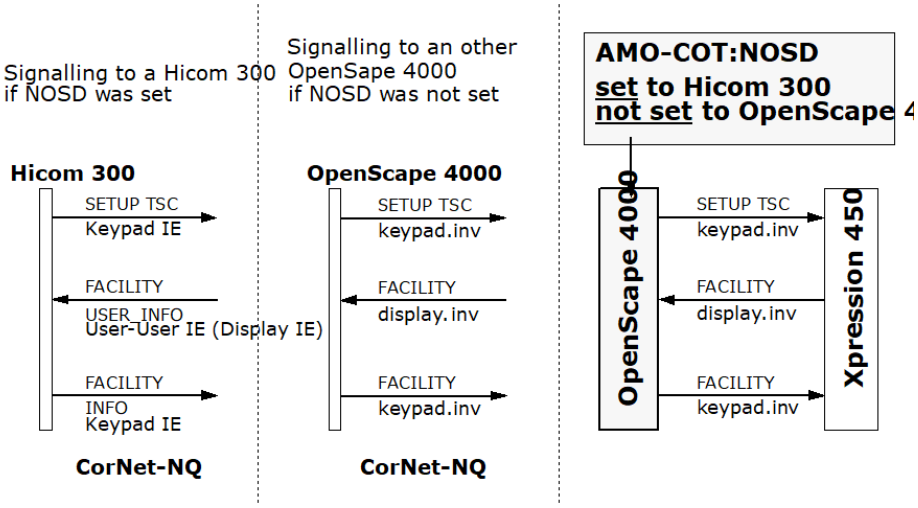
17.49 NOSD - No Simple Dialog Available

Feature:

OpenScape 4000 has to map the SS-SD Operations (keypad.inv, display.inv) to ordinary CorNet-N IEs even for CorNet-NQ leading to old IM-Switch.

Function:

Parameter is set: If NOSD is set on a CorNet-NQ Trunk, SS-SD request shall use a Keypad IE within the CorNet-NQ Tunnel, otherwise a keypad.inv operation shall be used.



Parameter is not set: Operation will be sent (see picture above).

Hints:

- Only used for Supplementary Service Simple Dialog (SS-SD)
- NOSD has to be set on every Cornet-NQ Trunk leading to a switch Hicom 300E V3.1 and older
- Effect both way for all services.

AMO-Interrelationships:

None

Device type:

Digital trunks.

Protocol variants:

CorNet-NQ

17.50 NOTO - No Tone for Unsuccessful Call

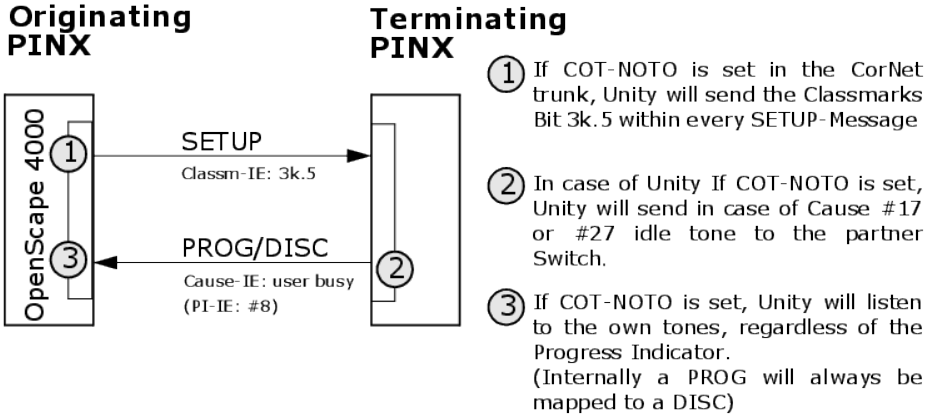
Feature:

Interfacing with CorNet-N and CorNet-NQ of version HV1.0 UK or older.

Function:

Parameter is set: If NOTO is set on a CorNet-N trunk, the feature indicator 3k Bit 5 " No tones for Unsuccessful Calls sent" will be included in every outgoing SETUP by call processing.

Parameter is not set: The Classmarks Bit 3k.5 will not be set within the SETUP, i.e. OpenScape 4000 will listen to the terminating busy/out-of-service tone and will provide the originating PINX with tones in case of incomming calls.



Hints:

NOTO has to be set on every CorNet-N trunk leading to an US-Switch (Rel. 6.x).

It has to be set on every Cornet-N and CorNet-NQ Trunks in the US-Marked. (Not set in the IM Marked except the IM-Switch is connected to an US-Switch.)

Effect bothway for speech, 3.1 kHz audio.

AMO-Interrelationships:

None

Device type:

Digital trunks.

Protocol variants:

CorNet-N and CorNet-NQ (Service Voice)

17.51 NOVC - No override on CO connections

Feature:

"Network-wide knocking/camp-on" feature

"Manual override for 40 seconds" feature

"Emergency override/forced hold" feature

Function:

The NOVC COT parameter can be used to control an incoming override via a line to a busy subscriber conducting a trunk call. The parameter only functions in conjunction with the KNOR COT parameter and is limited to subscribers within a node. It does not work on a network-wide basis.

An override via a line in whose COT the parameters NOVC and KNOR are set is only executed if the subscriber is not busy with a trunk call.

An override via a line in whose COT the parameters NOVC and KNOR are not set is always executed. Even if the subscriber is busy with a trunk call.

The COT parameter KNOR should be set for all outgoing seized lines between the overrider and the override destination and for the last incoming seized line - by means of which the override destination is reached.

IMPORTANT: The IBSY (intercept when busy) parameter must not be set on main system trunks if KNOR (trunk with knocking/ override) is set in the remote station.

AMO Interrelationships:

COT Classes of Trunks:

KNOR - Knocking/override possible

ZAND Central System Data:

ALLDATA/DATA - "Override" group .... e.g. OVRMST Override in Multiple States

FEASU Features in the SWU:

OVR .... A station with override/camp-on authorization can override/camp-on at a busy station terminal during a call

FRKN .... Free to knock for digital stations

SDAT Administration of subscriber-based features and general, non-device-dependent subscriber data:

Overrider: OVR .... Knocking override and KN Knocking/call waiting

Knocking override destination: RKNOVR .... Override/camp-on rejection may not be set

COS Classes of Service:

AUTOV .... Automatic override, China

RKOABS .... Reject knocking/override absolute may not be set for the override/ knocking destination

Device types:

Analog networking trunks: For example, MAINEM, SATEM

Digital tie trunk circuits and interface circuits: For example, SOCONN, S2CONN

Protocol variants:

For example, ANALOG, CORNV33, ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC)

17.52 NPIS - Numbering Plan ISDN on outgoing trunk calls

Feature:

This COT describes, that the next node can use numbers in Numbering plan ISDN to reach this physical node. In general, this is a indication, that the switches at both ends of the trunk use numbering plan ISDN for networking.

Function:

In more detail, is used to determine the NPI for sending redirection parties in case of set COT parameter AULN, RWSN, if the NPI can not be determined from the redirection party itself. E.g. A user B in switch 1 programms an internal CF by entering the extension of the redirection number only (normal case). If a user A in switch 2 calls B, networking must modify the redirection number in a way, that switch 2 can use this number to reach B. This COT defines, what NPI is used to sent the redirection party is from switch 1 to switch 2.

AMO-Interrelationships:

Only one of the 3 COT parameters NPPR,NPIS, NPUN must be set. If none of the 3 COT parameters is set, the system behaves as if NPUN was set. This COT is only relevant, if COT RWSL, AULN set. If incorrectly set: CF is not executed!

Device type:

Applicable to all digital trunks with outgoing calls

Protocol variants:

Applicable to all digital protocols

17.53 NPPR - Numbering Plan PRIVATE on outgoing trunk calls

Feature:

This COT describes, that the next node can use numbers in Numbering plan PRIVATE to reach this physical node. In general, this is a indication, that the switches at both ends of the trunk use numbering plan PRIVATE for networking.

Function:

In more detail, is used to determine the NPI for sending redirection parties in case of set COT parameter AULN, RWSN, if the NPI can not be determined from the redirection party itself. E.g. A user B in switch 1 programms an internal CF by entering the extension of the redirection number only (normal case). If a user A in switch 2 calls B, networking must modify the redirection number in a way, that switch 2 can use this number to reach B. This COT defines, what NPI is used to sent the redirection party is from switch 1 to switch 2.

AMO-Interrelationships:

Only one of the 3 COT parameters NPPR,NPIS, NPUN must be set. If none of the 3 COT parameters is set, the system behaves as if NPUN was set. This COT is only relevant, if COT RWSL, AULN set. If incorrectly set: CF is not executed!

Device type:

Applicable to all digital trunks with outgoing calls

Protocol variants:

Applicable to all digital protocols

17.54 NPUN - Numbering Plan UNKNOWN on outgoing trunk calls

Feature:

This COT describes, that the next node can use numbers in Numbering plan UNKNOWN to reach this physical node. In general, this is a indication, that the switches at both ends of the trunk use numbering plan UNKNOWN for networking.

Function:

In more detail, is used to determine the NPI for sending redirection parties in case of set COT parameter AULN, RWSN, if the NPI can not be determined from the redirection party itself. E.g. A user B in switch 1 programms an internal CF by entering the extension of the redirection number only (normal case). If a user A in switch 2 calls B, networking must modify the redirection number in a way, that switch 2 can use this number to reach B. This COT defines, what NPI is used to sent the redirection party is from switch 1 to switch 2.

AMO-Interrelationships:

Only one of the 3 COT parameters NPPR,NPIS, NPUN must be set. If none of the 3 COT parameters is set, the system behaves as if NPUN was set. This COT is only relevant, if COT RWSL, AULN set. If incorrectly set: CF is not executed!

Device type:

Applicable to all digital trunks with outgoing calls

Protocol variants:

Applicable to all digital protocols

17.55 NQNP - Neighboring node does not support CorNet-NQ network-wide call pickup

Feature:

Network-wide PU groups

Network-wide call pickup

Function:

In the case of ECMA or Cornet-NQ networks between an OpenScape 4000 and a Hicom 300 E V2.0 or a Hicom 300 E V1.0, the COT parameters NQNP and NQPI must be set on the tie trunk circuits of the OpenScape 4000, which lead to the Hicom 300 nodes of system version Hicom 300 E V2.0 (V3.6) or Hicom 300 E V1.0 (V3.5).

If the COT Parameter NQNP or NQPI is not set, the connected number is missing in the call data record under CALL PICKUP. The error occurs because the FACility signal with a call pickup information element is not understood by the older Hicom 300 system versions Hicom 300 E V2.0 or Hicom 300 E V1.0.

NQPI = CorNet-NQ network-wide call pickup information for the network-wide PU groups feature is not supported between the calling and called subscribers (trunks that do not support NQ Operations Call Pick Info)

NQNP = CorNet-NQ network-wide call pickup between the calling and called subscribers is not supported (trunks that do not support NQ Operations Call Pick-up)

AMO Interrelationships:

AMO COT: <PAR=NQPI>

Device types:

Digital tie trunk circuits

Network protocols:

For example, ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC)

17.56 NQPI - Neighboring node does not support CorNet-NQ network-wide call pickup information

Feature:

Network-wide PU groups

Network-wide call pickup

Function:

In the case of ECMA or Cornet-NQ networks between a OpenScape 4000 and a Hicom 300 E V2.0 or a Hicom 300 E V1.0, the COT parameters NQPI and NQNP must be set on the tie trunk circuits of the OpenScape 4000, which lead to the Hicom 300 nodes of system version Hicom 300 E V2.0 (V3.6) or Hicom 300 E V1.0 (V3.5).

If the COT parameter NQPI or NQNP is not set, the connected number is missing in the call data record under CALL PICKUP. The error occurs because the FACility signal with a call pickup information element is not understood by the older Hicom 300 system versions Hicom 300 E V2 or Hicom 300 E V1.0.

NQPI = CorNet-NQ network-wide call pickup information for the network-wide PU groups feature is not supported between the calling and called subscribers (trunks that do not support NQ Operations Call Pick Info)

NQNP = CorNet-NQ network-wide call pickup between the calling and called subscribers is not supported (trunks that do not support NQ Operations Call Pick-up)

AMO Interrelationships:

AMO COT: <PAR=NQNP>

Device types:

Digital tie trunk circuits

Network protocols:

For example, ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC)

17.57 NTON - Do not connect dial tone or announcement for incoming seizure of analog circuits

Feature:

Connect dial tone or announcement for incoming seizures

Function:

If the NTON parameter is set in the COT of an incoming seized analog circuit, no dial tone or announcement is connected to the calling node.

Only one of the COT parameters for the tone types may be set: Either PAR=NTON ... no tone or PAR=DTNI ... internal dial tone or PAR=DTNE ... external dial tone or PAR=VM ... Voice Mail or PAR=ANNC ... local announcement. If you do not follow this rule, then you cannot set up or modify a COT. Error message F04 or F05 is output.

F04: No parameter value specified for tone type NTON, DTNI, DTNE, VM, or ANNC

F05: Only one of the following tone types may be specified: NTON, DTNI, DTNE, VM, or ANNC

AMO interrelationships:

COT Classes of Trunks: DTNI, DTNE, VM, or ANNC

TACSU Configure Analog Trunks:

When configuring the analog circuits (AMO TACSU), if you do not assign **NTON** to

GW	:	Incoming trunk circuit, DDI, dialing group selection
MOSIG	:	Main station interface
DP	:	Dial pulse signaling
LNSEL	:	Two-way trunk circuit, outgoing DP and DTMF, with DDI, line selector
SFS	:	Incoming trunk circuit, monitoring frequency system; Flash to trunk

the system outputs the error message H14 "Conflict with default procedure for this device: trunk parameter **NTON** not entered (AMO COT)".

IMPORTANT: The NTON parameter has no function for digital circuits, but you should activate it in the COT of these circuits. If you do not, the system cannot configure the assigned COT.

Device types:

Analog, digital trunk circuits, interface circuits, and tie trunks

Protocol versions:

All

17.58 OHKQ - Off Hook Queuing for transit connections

Feature:

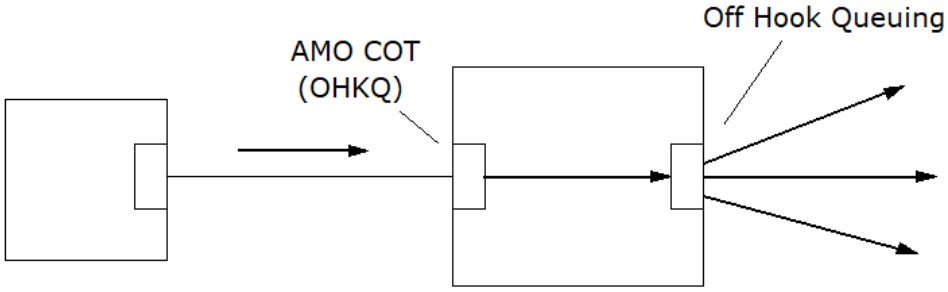
Off Hook Trunk Queuing

Function:

In incoming calls this value controls whether "Off Hook Queuing" is required when the call is destined for another system.

If the OHKQ parameter is set for incoming calls, then transit connections are queued on the outgoing side.

No queuing takes place in this transit node without this parameter.



- analog incoming trunk: If the LCOSV of the trunk is assigned OHKQT, then all incoming calls can be queued during transit.
- digital (NQ) incoming trunk: If the LCOSV of the A station is assigned OHKQT, then the incoming calls can be queued during transit.
- digital (QSIG/DSS1) incoming trunk: If the LCOSV of the trunk is assigned OHKQT, then all incoming calls can be queued during transit.

AMO Interrelationships:

AMO COS LCOSV of A station (with off-hook-tandem parameter OHKQT)

Device types:

Analog and networking trunks for voice service

17.59 PINR - Signal PIN features network-wide

Feature:

Network-wide PIN features (Personal Identification Number)

Function:

The parameter PINR is used to enable the signal messages for the PIN features, such as "PIN activation, PIN deactivation by mobile subscriber, PIN deactivation at home station, activate/deactivate COS changeover and update PIN mail information" network-wide on a COT-dependent basis.

This parameter is checked along the nodes transited between the user and the destination object, both in the case of incoming and outgoing digital tie trunk circuits. The links between the user and the destination object must be set up with LCR.

Connection setup to the destination object is rejected if the parameter is not set at any point among the relevant trunks in the network.

AMO Interrelationships:

IMPORTANT: The parameter **PINR** must not be set in the case of network links to Hicom 300 nodes lower than Hicom 300 E V1.0 or external systems which do not permit network-wide PIN signaling.

FEASU Features in the SWU:

PINNW	....	Enable PIN network-wide

ZAND Central System Data:

PIN	...	If a subscriber identifies himself at an external station and selects the server from there, then, depending on the switch, the number of the home station or external station is signaled to the server

Device types:

Digital interface circuits and tie trunk circuits

For example, SOCONN, S2CONN

Protocol variants:

For example

ECMA1R	ECMA QSIG V1 protocol
ECMAV2	CorNet-NQ Issue 2.1 Dec. 96 Basic ETSI
ECMAV2R	QSIG ETSI ETS 300 172 3rd. with SS 2nd.
PSS1V2	CorNet-NQ Issue 2.1 Dec. 96 Basic ISO/IEC
PSS1V2R	QSIG ISO ISO/IEC 11572 2nd. with SS

17.60 PRI - Network-wide prioritized control of incoming calls at ATND

Feature:

Extended call queuing function at ATND

Function:

Network-wide prioritized control of incoming calls at the ATND in an homogeneous OpenScape4000/HiPath 4000 network connected via CorNet-NQ.

The function is activated with the COT parameter PRI function. This is to be set on the incoming seized CorNet-NQ trunks which are passed when the connection is established. This enables the data for prioritized control of incoming calls on the ATND to be transferred network-wide.

If a terminal causes an outgoing trunk seizure, then the priority number of the trunk of the outgoing trunk is transferred.

If the COT parameter PRI is not set, then the data for the extended call queuing function on the ATND is taken from the trunk's trunk memory when the trunk is seized.

AMO Interrelationships:

BUEND .... PRIONO =<priority class>;

FEASU .... Enable INCPRIO feature (increase priority after timeout)

Device types:

Digital interface circuits

Protocol variants:

ECMAV2, PSS1V2

17.61 RCL -Recall to attendant console or to transferring party if user hangs up in consultation call

Feature:

Recalls to attendant console

Recalls after transfer of a consultation call to the transferring party.

Function:

Every immediate or time-conditioned recall to the attendant console that can result from an externally held incoming or outgoing consultation call that does not originate in the central office is not suppressed, but is instead executed.

The same also applies to recalls that can result for the transferring party from a transfer in dialing, calling or busy status if the transfer does not lead to a call/voice call with the party called in the consultation call.

This function can be activated or deactivated with the COT parameter **RCL** which is to be set for the trunk on hold.

AMO Interrelationships:

The RCL function is not executed if the RCLS COT parameter is set for the trunk on hold.

Device types:

Networking trunks, analog trunks

17.62 RCLS - Recalls to ATND suppressed in node without attendant console

Feature:

Recalls after hangup in consultation mode

Recalls after transfer of an internal or external line in dialing, calling or busy status if an external line is waiting

Function:

Every recall that can originate from an external held incoming or outgoing consultation line is suppressed and immediately initiates the release of the whole line.

This function can be activated or deactivated with the COT parameter **RCLS**.

Device types:

Networking trunks, trunks for special equipment

17.63 RLIN - Receive Trailing LIN digits

Feature:

Indication whether 911 calls may arrive on incoming E&M tie trunks with trailing LIN/CPN digits.

Function:

Parameter is set: E911 emergency calls may arrive on incoming E&M Tie trunks with trailing LIN digits.

Parameter is not set: Tie trunks with trailing CPN digits.

Hints:

- Do not set **SECO** and **RLIN** together in a COT!
- Effect only incoming.

AMO-Interrelationships:

None

Device type:

Analog (E&M) trunks.

Protocol variants:

all analog (E&M).

17.64 SANH - Synchronized Announcement of Non OpenScape 4000 Switch

Feature:

Configure COT-Parameter that indicates the authorization for use of synchronized announcement. This is, because these switches (non OpenScape 4000) do normally not send an authorization information for synchronized announcement as it is done in OpenScape 4000 network .

Function:

If COT parameter SANH is set for incoming trunk, also in case of Connection_Type /= AMT and no feature_indicator for internal use of synchronized announcement can be identified, the synchronized announcement can be used. Additionally, other COT parameters, ZAND switches. etc. has to be set correctly, as it is requested for this feature (see feature description, AMO -SYNCA).

If COT parameter SANH is not set for incoming trunk, the internal use of synchronized announcement is possible only in case of received feature-indicator for internal use of synchronized announcement. In case of incoming calls via Non OpenScape 4000 switches, no synchronized announcement can be used.

Hints:

This new COT parameter effects only incoming traffic for trunk.

Only for feature SYNCHRONIZED ANNOUNCEMENT!

AMO-Interrelationships:

COT parameters, ZAND switches

Device type:

his new COT parameter applies only for trunk devices (not for special trunks like PSM, PSE, ANSES, etc.)

Protocol variants:

Applies to all ISDN protocols.

17.65 SDID - Deactivate partial digit analysis in the device handler, activate single digit direct inward dialing

Feature:

Activate/deactivate partial digit analysis in the device handler

Single digit direct inward dialing

Function:

If the SDID parameter is set in the COT of a trunk, then the partial digit analysis set up with the AMO TWABE for the preliminary analysis of digit sequences is not performed during incoming seizure in the device handler. The incoming digit

sequences are not collected in the device handler. They are forwarded to call processing on a digit-by-digit basis.

On the other hand, if the SDID parameter is not set, then incoming digit sequences are forwarded via partial digit analysis in the device handler in the case of an incoming seizure, so that the digits are pre-analyzed according to the TWABE administration data and are collected until the set number for the call number length is reached in the device handler. This relieves actual partial digit analysis in call processing.

AMO Interrelationships:

TWABE Partial Digit Analysis

Device types:

Analog and networking trunks

For example, DP, SOCOD, S2COD, SOCONN, S2CONN, etc.

Protocol variants:

For example:

ANALOG - Protocols for analog trunks

CORNV33 - CorNet protocol

ECMAV1 - ECMA QSIG V1 protocol

ECMAV2 - CorNet-NQ Issue 1.2 Dec. 96 Basic ETSI

ECMAV2R - QSIG ETSI ETS 300 172 3rd. with SS 2nd.

PSS1V2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ISO/IEC

PSS1V2R - QSIG ISO ISO/IEC 11572 2nd. with SS

EDSGER - EDSS1 protocol for Germany

ETSI - Standard EURO-ISDN

EDSS1NET - EDSS1 Net Side protocol

17.66 SECO - Send Emergency Call Outgoing

Feature:

Indication whether ECP D-channel info is supported on the outgoing public ISDN trunk.

Function:

Parameter is set: ECP-D-channel info LIN is supported on the outgoing public ISDN.

Parameter is not set: ECP-D-channel info LIN is not supported.

Hints:

- If the Partner Network Analog or ISDN support the E911 Emergency Call Process ECP.
- Do not set **SECO** and **RLIN** together in a COT!
- Effect only outgoing.

AMO-Interrelationships:

None

Device type:

Digital trunks.

Protocol variants:

all ISDN protocols with possibility of LIN transport.

17.67 SIRI - Single ring burst

Feature:

Calls incoming over digital central office trunks from other branches via VPN ring as an internal call & calls incoming from other sources ring as an external call.

Function:

For incoming calls passing the VPN.

Parameter set: All calls from other branches ring internal (single ring burst).

Parameter not set: All calls from other branches ring external.

AMO-Interrelationships:

It must only be set for the trunks that are used by incoming calls passing the VPN.

Device type:

Only trunks for incoming voice calls.

Protocol variants:

Applicable to all protocols.

17.68 SPAH - Park system and hold analog connection

Feature:

System Park/Call Hold Analog ID10100

Function:

In the case of connections, this value controls whether or not the trunk can be "parked" and whether this trunk can be placed on hold.

AMO Interrelationships:

None

Device types:

Analog tie trunk circuits and CO trunk circuits, digital tie trunk circuits and CO trunk circuits

Protocol variants:

Not dependent on protocol

17.69 SPCM - Define a speech-compressed trunk group

Feature:

Voice Compression VC

Function:

The VCM (Voice Compression Module) required for the "Voice Compression - Increase voice transfer capacity on S0/S2 links" feature should be set up with a special COT in which the following parameters are set:

SPCM = Speech channel compressed and NLHT = No local hold tone, hold tone from remote system.

IMPORTANT: With VC, noises occur during toggling due to connection setup/clear down. The activation of the COT parameter NLHT suppresses the activation and deactivation of tones during toggling and consultation.

AMO Interrelationships:

Configure FEASU features, VOICO Configure Voice Compression, etc.

Device types:

VCCOD Digital CO trunk circuit for voice compression with 7 or 15 B channels

VCCONN Digital tie trunk circuit for voice compression with 7 or 15 B channels

Protocol variants:

Protocols that support the protocol element for limiting compression/ decompression cycles, e.g. CORNV33, ECMAV2, PSS1V2

17.70 SPSR - Identify lines for a Phone Mail or Voice Mail server

Feature:

Phone Mail 6.2 connectivity with CorNet-N

Voice Mail Service VMS

Function:

The COT parameter SPSR is used to identify digital lines for a Phone Mail server whose protocols cannot signal the "Phonemail Server" indication in the classmarks, or analog lines for a Voice Mail server. In addition, this parameter also identifies all node links between the user and the Phone Mail or Voice Mail server to which the "Phonemail Server" indicator is transferred.

This parameter should always be set for the aforementioned lines and node links, as otherwise it is not possible to guarantee the functions set with the ZAND NOSPXTP parameter - such as through-connect/release during speed

transfer by the attendant console to a subscriber that has call forwarding or call forwarding if no answer to a Phone Mail or Voice Mail server.

AMO Interrelationships:

AND Central System Data ..... Branch ATND

NOSPXTPM = yes: The connection to the server is released if the attendant console is using speed transfer and reaches the Phone Mail or Voice Mail server. The attendant console allows the call to be transferred to Phone Mail when the function transfer key is pressed.

NOSPXTPM = no: The connection to the server is released if the attendant console is using speed transfer and reaches the Phone Mail or Voice Mail server.

Device types:

Analog and digital interface circuits and tie trunk circuits

SOCONN, S2CONN

Protocol variants:

If the Phone Mail S0 interface is operated with the CORNV33 - CorNet protocol/ CORNV33R - CorNet protocol then the SPSR parameter should not be set. The SPSR parameter should be set for all other protocols.

If a trunk is operated with node coupling between the user and the Phone Mail or Voice mail server with protocol CORNV33 - CorNet protocol / CORNV33R - CorNet protocol / ECMA1 - ECMA QSIG V1 protocol / ECMA1R - ECMA QSIG V1 protocol / ECMAV2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ETSI / ECMAV2R - QSIG ETSI ETS 300 172 3rd. with SS 2nd.

PSS1V2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ISO/IEC / PSS1V2R- QSIG ISO ISO/IEC 11572 2nd. with SS

then the **SPSR** parameter should not be set. The **SPSR** parameter should be set for all other protocols.

17.71 SUPN - Suppress name network-wide

Feature:

Change Request CR10077: Suppress name and traffic direction in Cyrillic script

Function:

The SUPN parameter should be set if no names are to be transmitted to the neighboring node.

This works when networking messages are sent in an outgoing direction, irrespective of trunk seizure. The protocol elements Calling Name, Called Name, Connected Name, Redirection Name, Redirecting Name and User Name are suppressed in all messages.

This makes it possible to suppress the sending of names, for example in the event that the subsequent node is unable to display names in Cyrillic script.

If the SUPN parameter is not set, the names are transferred to the neighboring node in accordance wit the set protocol generation.

Device types:

Digital trunks

Network protocols:

All protocols which transmit names, e.g. CORNV33, ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC)

17.72 T4WA - Level switching on T reference point for device class TMA4WIRE

Feature:

T reference point matrix

Function:

The level values administered in a loaded T reference point matrix for the device class "TMA4WIRE - tie trunk circuit 4 wire analog" are switched to the ports involved in the connection during the seizure phase in the receiving direction if the T4WA parameter is set in the COT of an analog tie trunk circuit.

If the parameter is not set for these trunk types or other tie trunk circuit types, then the level is switched until a defined type of connection is received with the values assigned for the UNDEFDEV device class.

AMO Interrelationships:

TREF ... Administer T reference point matrix

Device types:

The device class TMA4WIRE includes the following analog interface circuits and tie trunk circuits, for example:

DEV=TSEML1, DEVTYPE=TT ..... Both way tie trunk circuit for carrier frequency on special inter-PBX trunk; TMSVF module: CO trunk circuit for tie trunk circuit traffic with tone selection

Parameter T4WA should be set on these devices.

Protocol variants:

ANALOG - Protocols for analog trunks

17.73 TCC - Signal incoming calls on analog tie trunk circuits as trunk calls

Feature:

Different terminal call signals

Function:

The TCC COT parameter can be used to control different call signals on analog tie trunk circuits of the type DB_CP_DEVTYP_TMA_CONN.

TCC set:

Terminals are called with the call type " co/extended call ring EXTCO" administered with the AMO ZAND.

TCC not set

Terminals are called with the call type "Standard ring NORM" administered with the AMO ZAND.

AMO Interrelationships:

ZAND: TYPE=RNGTYPE COEXT (co/extended call ring), NORM (standard ring)

TYPE=ALLDATA EXTCO (co/extended call ring also for switched calls and consultations from trunk calls)

FEASU: TYPE=FREE, LM=RNG Ring discrimination

Device types:

Analog tie trunk circuits type DB_CP_DEVTYP_TMA_CONN

For example, TSILP Tie trunk circuit, DC loop with idle signal loop

Protocol variants:

Analog

17.74 TCET - Through-connect a networking transit connection after call extend in call status

Feature:

Dial tone after transfer in call status

Function:

After an external consultation connection has been transferred in call status to an externally held partner, the resulting transit connection between the waiting party and the consulted party is through-connected.

Requirements: The trunks involved in the resulting transit connection must be networking trunks and theTCET parameter must be activated in the COT of the waiting trunk.

IMPORTANT: The through connection function is only executed if the CHRT parameter is not activated in the COT of the waiting trunk!

AMO Interrelationships:

COT Class of Trunk

CHRT With unscreened transfer, ringback tone should be supplied instead of hold tone

Device types:

Networking trunks .... digital CO trunk circuits, interface circuits and tie trunk circuits and analog NW trunks

For example, SOCOD, S2COD, SOCONN, S2CONN, etc.

Protocol variants:

For example,

ANALOG - Protocols for analog trunks

CORNV33 - CorNet protocol

ECMAV1 - ECMA QSIG V1 protocol

ECMAV2 - CorNet-NQ Issue 1.2 Dec. 96 Basic ETSI

ECMAV2R - QSIG ETSI ETS 300 172 3rd. with SS 2nd.

PSS1V2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ISO/IEC

PSS1V2R - QSIG ISO ISO/IEC 11572 2nd. with SS

EDSGER - EDSS1 protocol for Germany

ETSI - Standard EURO-ISDN

EDSS1NET - EDSS1 Net Side protocol

17.75 TGRE - Control LCR rerouting on the basis of cause values

Feature:

LCR rerouting

Selective trunk group selection during device search

Signaling in the C-Tel signaling mediation device (CSMD)

Function:

COT parameter TGRE can also be used to vary the LCR rerouting administered by the AMOs RICHT and LDAT during an outgoing trunk seizure.

If the TGRE parameter is set in the COT of a trunk, then rerouting is only carried out during the LCR process if one of the following cause values is entered in the release message:

Q931 Q850: Cause no	CorNet: Cause no	Cause
01	01	Unallocated (unassigned) number
03	03	No route to destination
22	22	Number changed
44	44	Requested trunk/channel not available

If the TGRE parameter is not set in the COT of a trunk, then rerouting is only carried out during the LCR process if one of the following cause values is entered in the release message.

Q931 Q850: Cause no	CorNet: Cause no	Cause
03	03	No route to destination
06	06	Channel unacceptable
33	Private	Trunk out of order
34	34	No trunk/channel available
38	38	Network out of order
41	41	Temporary failure
42	42	Switch equipment congestion
44	44	Requested trunk/channel not available
47	47	Resource unavailable
	Private	Outgoing calls barred
63	63	Service or option not available, unspecified
82	82	Identified channel does not exist
102	102	Recovery on timer expiry
		Network congestion

AMO Interrelationships:

AMO RICHT

REROUT: YES ... RTE suitable for rerouting

AMO LDAT Administration of LCR routes

LCR attribute LATTR: PRIMRTE .... Trunk group only first primary route

REROUTE .... Trunk for reroute only

IMPORTANT: LCR attributes PRIMRTE and REROUTE cannot both be set at the same time!

Device types:

Digital CO trunk circuits, interface circuits and tie trunk circuits

For example, SOCOD, S2COD, SOCONN, S2CONN, etc.

Protocol variants:

CORNV33 - CorNet protocol

CORNV33R - CorNet protocol

ECMA1 - ECMA QSIG V1 protocol

ECMA1R - ECMA QSIG V1 protocol

ECMAV2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ETSI

ECMAV2R - QSIG ETSI ETS 300 172 3rd. with SS 2nd.

PSS1V2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ISO/IEC

PSS1V2R - QSIG ISO ISO/IEC 11572 2nd. with SS

EDSGER - EDSS1 protocol for Germany

ETSI - Standard EURO-ISDN

EDSS1NET - EDSS1 Net Side protocol

17.76 TR6T -Tones are supplied as in a 1TR6 CO

Feature:

Tones are regulated as in a 1TR6 CO

Tie trunk circuit traffic to a system with no tones

Trunk dial tone on the USER side in the case of a DSS1 system connection

Function:

Parameter TR6T controls the supply of a tone to the calling partner, depending on trunk seizure in outgoing and incoming terminating and transit traffic.

Outgoing trunk traffic: When an end-of-dialing message is received from the line, the tone belonging to this message is activated on the partner device if outgoing seizure has taken place by means of a digital tie trunk circuit, interface circuit or CO trunk circuit in whose COT the TR6T parameter is set.

IMPORTANT: The function only works if the TNDV parameter is not set in the COT of the outgoing seized trunk!

Incoming trunk traffic: If the original system sends a setup message without digits, the system reacts in Voice and 3.1-kHz audio connections by activating a dial tone if the parameter TR6T is set on the incoming seized trunk. This is signaled in the Setup Ack message in the progress indicator for the device handler.

Transit traffic: When the TR6T parameter is set on the outgoing side or the transit connection, the incoming alert or disconnect message from the destination system is checked on the basis of the progress indicator to see whether a free or busy tone is already generated in the destination system.

If not, then a separate free or busy tone is supplied by the incoming seized transit trunk in the direction of the original system.

IMPORTANT: The TR6T parameter should be set on the outgoing seized transit trunk if the external node does not activate a free or busy tone on an incoming call, but only sends

an Alert or Disconnect signal. The OpenScape 4000 node activates the free or busy tone. Disadvantage: Switching delays!

AMO Interrelationships:

COT Classes of Trunks:

TNDV - Tone in end-of-dialing signals activates the partner device of the trunk

Device types:

Digital tie trunk circuits, interface circuits and CO trunk circuits

Network protocols:

CORNV33 - CorNet protocol

CORNV33R - CorNet protocol

ECMA1 - ECMA QSIG V1 protocol

ECMA1R - ECMA QSIG V1 protocol

ECMAV2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ETSI

ECMAV2R - QSIG ETSI ETS 300 172 3rd. with SS 2nd.

PSS1V2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ISO/IEC

PSS1V2R - QSIG ISO ISO/IEC 11572 2nd. with SS

EDSGER - EDSS1 protocol for Germany

17.77 TNDV - Tone in end-of-dialing signals activates partner device of trunk

Feature:

Tone switching in end-of-dialing signals

Announcement equipment for synchronous announcements

Function:

If the parameter TNDV is set in the COT of a trunk, the tone sent by the line is not switched through to the partner device, but rather the partner device creates the relevant tone on the basis of the end-of-dialing message sent by the trunk.

Requirement: In the case of the analog trunk or seized outgoing digital S0/S2 trunk, the TNDV parameter must be set, while the TR6T parameter may not be set.

IMPORTANT: The TNDV parameter generally releases the network-wide applications of announcement equipment for synchronous announcements.

AMO Interrelationships:

COT Classes of Trunks:

TR6T .... Tones are supplied as in 1TR6 CO

ZAND:

COANN .... Switch or release an announcement from the public network to the subscriber during outgoing seizure

Device types:

Analog and digital CO trunk circuits, interface circuits and tie trunk circuits

For example, SOCOD, S2COD, SOCONN, S2CONN, etc.

Protocol variants:

CORNV33 - CorNet protocol

CORNV33R - CorNet protocol

ECMA1 - ECMA QSIG V1 protocol

ECMA1R - ECMA QSIG V1 protocol

ECMAV2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ETSI

ECMAV2R - QSIG ETSI ETS 300 172 3rd. with SS 2nd.

PSS1V2 - CorNet-NQ Issue 2.1 Dec. 96 Basic ISO/IEC

PSS1V2R - QSIG ISO ISO/IEC 11572 2nd. with SS

EDSGER - EDSS1 protocol for Germany

17.78 TRBA - Transfer before answer to first connection

Feature:

Introduce consultation before dialing in the case of an outgoing S0/S2 first connection (XBFADIAL feature)

Introduce consultation after dialing 'free or unanalyzed' in the case of an outgoing S0/S2 first connection (XBFADIAL feature)

Transfer of a consultation connection if the selected target has not yet responded to an outgoing S0/S2 first connection on hold

Function:

The function "Transfer a consultation connection in Voice service if the selected target has not yet responded to an outgoing S0/S2 first connection on hold" is only dealt with locally in the source node. Other nodes in the network have no knowledge of this function.

This function only works in the source node if the TRBA parameter is set in the COT of the outgoing seized trunk - by means of which the initial connection is made - and the transferring subscriber has entered the special class of service SUTVA (subscriber can transfer before answering). In addition, the XBFADIAL "Transfer before answering from dialing status" or XFBACALL "Transfer before answering from calling status" feature is to be released. In conjunction with the release of the ATTR feature "Switching by attendant console before the externally selected subscriber answers", the TRBA parameter must be set in the COT of the trunk with effect from system variant EV3.0 onwards.

AMO Interrelationships:

AMO COT <CSN7 ... Identify DIUS2 trunks on CSN7 networks, China>

AMO FEASU <XBFADIAL/XFBACALL>

IMPORTANT: The XBFADIAL and XFBACALL features may not be activated simultaneously.

Device types:

Digital CO trunk circuits, interface circuits and tie trunk circuits

---

IMPORTANT: NW trunks with CSN-7 protocol, NAL loop signals, special inter-PBX signals and all analog tie trunk circuit signals on the first connection without call status do not support this function. NW trunks with CSN-7 protocol, NAL loop signals, special inter-PBX signals and all analog tie trunk circuit signals on the consultation connection in calling status and without call connection on the S0/S2 first connection do not support this function either. Functional Devices (including SIP phones) do not support this function.

Protocol variants:

For example, CORNV33, ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC), Euro-ISDN

17.79 TWDS - Transfer Allowed without Disconnect Supervision

Feature:

This attribute set means that this trunk can be connected to another trunk when none of them has Disconnect Supervision

Function:

General: Two trunks without Disconnect Supervision (meaning that they are not able to signalize the release) can be connected together and this connection has to be supervised.

The TWDS parameter set to "yes" for a trunk means that this trunk can participate in a "Two Trunks Supervised Connection".

Hints:

- This parameter has no meaning for trunks that provide Disconnect Supervision.
- If the trunk has no disconnect supervision and this parameter is set to "no" then the connection with another trunk that does not have disconnect supervision will not be allowed, so the number of the connection posibilities will be diminuated.

AMO-Interrelationships:

AMO COT Parameter DSIT, NRAA, NRBA, ANS

For Incoming trunks: IF DSIT set to "no" THEN

- **TWDS** set means that this trunk can participate in a supervised connection.
- **TWDS** not set means that this trunk can not participate in a supervised connection.

For Outgoing trunks: the following COT parameters are checked in AMO ANS, NRBA, NRAA to determine if the trunk has disconnect supervision. If no disconnect supervision is provided then the TWDS will reflect:

- TWDS set means that this trunk can participate in a supervised connection.
- TWDS not set means that this trunk can not participate in a supervised connection.

COT parameters' checks performed for **disconnect supervision** in the outgoing direction:

IF ANS="no" THEN

IF NRAA="yes" and NRBA="yes" THEN

No disconnect supervision provided!

ELSE

IF NRAA="yes" THEN

No disconnect supervision provided

Device type:

Analog Trunks.

Protocol variants:

Analog

17.80 UUS1 - Implicit user-to-user signaling no. 1

Feature:

DSS1 User-to-User Service

Function:

UUS1 - Implicit user-to-user signaling no. 1. Standardized ETSI feature in EURO-ISDN for exchanging limited signal messages from terminal to terminal (DSS1 ... digital subscriber signaling system no. 1; EURO ISDN signaling). This enables a terminal to transfer messages which are not subject to network analysis transparently when a connection is set up. Unlike explicit user-to-user signaling number 1, the connection is always established in implicit user-to-user signaling number 1, even if the remote station does not support this ETSI feature.

The "user-to-user signaling no. 1 information", received via the network protocols EDSS1NET and EDSS1NETR is only forwarded to the destination system if the trunk parameter UUS1 is set in the COT of the incoming seized trunk.

If the trunk parameter is not set in the COT of the incoming seized trunk, then the data is extracted from the SETUP message in the case of EDSS1NET and EDSS1NETR network protocols and is therefore not forwarded to the target device.

IMPORTANT: In the case of all other protocols that transfer "user-to-user signaling no. 1 information", the "user-to-user signaling no. 1 information" is always forwarded to the target device, irrespective of the switch setting in the UUS1 trunk parameter.

AMO Interrelationships:

COT Classes of Trunks:

US1E: UUS1 (user-to-user signaling no. 1) explicit

ETSC: UUS1 (user-to-user signaling no. 1) ETSI-compliant

Device types:

Digital CO trunk circuits, interface circuits and tie trunk circuits

For example, SOCOD, S2COD, SOCONN, S2CONN, etc.

Protocol variants:

Protocols for which the trunk parameter is to be set so that "user-to-user signaling no. 1 information" can be forwarded when the connection is set up:

Protocol variants	Brief description
EDSS1NET	Protocol EDSS1 net side
EDSS1NETR	Protocol EDSS1 net side

17.81 VCMN - Voice compression not allowed

Feature:

Voice Compression VC

Function:

Because only voice signals can be compressed, a COT in which the

parameter VCMN = 'Voice compression not allowed' is set,

must be assigned before the Voice Compression feature is set for the trunks in which the type of connection (voice or data) is unknown or to which an external voice compression unit is connected.

AMO Interrelationships:

Configure FEASU features: VOICO Configure Voice Compression.

Device types:

Digital CO trunk circuits and interface circuits:

Protocol variants:

For example, CORNV33, ECMAV2, PSS1V2

18 COT Parameter - Internal and network-wide call detail recording (INCDR)

18.1 AOCC - Request charges per line for remote station

Feature:

Call Data Recording Enhancements CDRe (enhancement of existing call data recording for call data recording)

Function:

The **AOCC** parameter is used to set the sending or suppression of the "call charge details per line" request to the remote station because, for example, no charges are recorded in the user's own system.

AOCC set: When a connection is being set up or when a consultation connection is being transferred, the operation call "charge details per line" is sent to the remote station if the requesting partner device has entered CDRSTN class of service.

AOCC not set: The "call charge details per line" operation is not sent to the remote station either when a connection is set up or during transfer. The partner node does not send ongoing charge data.

IMPORTANT: It must be set on CORNET-NQ trunks. It may not be set on Cornet V3.3 trunks.

IMPORTANT: In the case of external systems with ECMA/ QSIG it is necessary to check whether the parameter is correctly interpreted in the remote station. Display information is lost if the interpretation is incorrect. The AOCC parameter may not be set with other protocols, such as DSS1, DPNSS1 (Digital Private Network Signaling System No. 1), DASS2 (Digital Access Signaling System No 2, protocol for use as trunk interface in Great Britain) because the remote station cannot interpret the protocol signals generated by it, so that the display information is incorrectly deactivated in the OpenScape 4000.

AMO Interrelationships:

COSSU: CDRSTN ... Immediate charge data display on the station if a display is available

---

IMPORTANT: The AMOs TACSU, TSCSU and TDCSU can also be used to assign a COS with CDRSTN authorizations to a trunk whose protocol cannot transfer the classmarks.

Device types:

Digital tie trunk circuits and interface circuits:

Protocol variants:

ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC)

18.2 CATR - Charge transfer via analog CO trunk circuits which are operated as tie trunk circuits in transit

Feature:

Call data recording

Function:

Charges are transferred by means of a transit connection which was established by means of analog trunks of DH device type DB_DH_DEV_TYP_TMLS and CP device type DB_CP_DEVTYP_TMA_CO if the **CATR** parameter is set on the incoming side of the transit route in the COT of the trunk and the corresponding generations for the function of the call data recording feature are activated.

AMO Interrelationships:

AMOs for call data recording

Device types:

For example,

DODIT	Direct outward dialing CO trunk circuit, DPSTN and DTMF, Receipt of a ready signal instead of dial tone detection, analog and digital CO trunk circuits, tie trunk circuits and interface circuits for Italy
DIDIT	Direct inward dialing CO trunk circuit, DPSTN, with DIDNC for Italy.
KZVRC	Bidirectional CO trunk circuit, with DID, CSN1-R2, China

Protocol variants:

ANALOG ... Protocols for analog trunks

18.3 CCTN - Apply trunk number as A number

Feature:

For example, signal A number, call data recording

Function:

In the case of an incoming line seizure, the parameter **CCTN** in the COT of an analog trunk causes the immediate transfer of the call number set in the CCT field with the AMO TACSU to the A call number field of the connection memory. As a consequence, every A number that is transferred in an internal or external

signal message contains either the original entry of the record number or an entry altered through a display modification.

For example, local or network-wide signaling of the A number for the B subscriber.

Signaling the calling party number for call data recording.

AMO Interrelationships:

TACSU ... <CCTN>

Device types:

Analog trunks

18.4 CDBO - Set record point in network for call data recording

Feature:

Call Data Recording (CDR)

Call data recording at break out to an external network

Function:

The COT parameter **CDBO** can be used to set the record point in the network for call data recording. The type of record point is forwarded to call data recording in the data records of the seizure, dialing, through-connect, transfer and end-of-call signal.

The following record points can be set with CDBO:

Record point in CDR record		
COT	Transit traffic	Terminating traffic
CDBO set	Record point: **BREAKOUT** Break out to an external network with a transit connection	Record point: **ORIGIN_BREAKOUT** Break out to an external network with a terminating connection
CDBO not set	Record point: **TRANSIT** Transit connection	Record point: **ORIGIN** Terminating traffic

AMO Interrelationships:

Call data recording

Device types:

Analog and digital trunks

Protocol variants:

All

18.5 CDFD - Call data recording for PNE lines

Feature:

Call data recording for PNE (Private Network Emulator) lines in the DTE service after unscreened transfer

Function:

If a DTE transit connection to a PNE occurs after an unscreened transfer, only the new chargee is sent to call data recording instead of a charge data record.

Requirements: The waiting trunk must be an outgoing seized CO trunk circuit with call data recording and the partner trunk which establishes the connection to the PNE must be a digital tie trunk circuit marked with the COT parameter **CDFD**.

IMPORTANT: The CDFD function is already part of the PNE software in PNE software status >= V3.0. Only set COT parameter CDFD on tie trunk circuits to the PNE and only when the PNE software status is < V3.0. PNE SW V3.0 (at least) should be used in HiPath 4000 V1.0 and higher.

AMO Interrelationships:

FEASU Features (bit string) in SWU .... Enable CDROGTR feature (call data recording for outgoing trunk calls)

LNCD Administration of LCR Routes .... LcrATTRribut=WCHREG (activate call data recording)

Device types:

Digital tie trunk circuits

Protocol variants:

For example, ECMAV2, PSS1V2, CORNETV, etc.

18.6 DFNN - Use default node number for trunk as a dummy source node number

Feature:

Display modification, prevention of network loops

Function:

The **DFNN** COT parameter causes the dummy node number assigned to the trunk with the AMO TACSU or TDCSU to be used as the source node number for the coming display modification. It prevents the reconstruction of source node numbers from numbers such as Calling Number, Connected Number, Redirecting Number, Redirection Number, etc. by means of dial analyses. In the case of outgoing display modification, the parameter DFNN has no effect. The node numbers assigned to the numbers are transferred.

AMO Interrelationships:

TACSU ... <node no>

TDCSU ... <node no>

IMPORTANT: If the LWCN and DFNN are set at the same time, then DFNN deactivates the function of LWCN in the incoming direction, but not in the outgoing direction.

Device types:

Analog and networking trunks

Protocol variants:

All protocols

18.7 DPRE - Send dial information actually sent to partner system as destination number with prefix digits to call data recording

Feature:

Call data recording for outgoing lines

Function:

The COT parameter **DPRE** should be set for CO trunk circuits or tie trunk circuits if the dial information actually sent to the partner system as the destination number and existing prefix digits is requested as output information by call data recording. This setting takes effect when an overflow trunk group is seized by a toll line.

In OpenScape 4000, TON = NATIONAL or TON = INTERNATIONAL can be set for NPI=ISDN. The missing prefixes are taken from AMO KNPRE. However, this is only the case if the AMO GEFE is used to specify the subscriber numbers (PARTY) to be modified in the branches (=TYPPARAM) PREINC (prefix handling for incoming traffic), PREINT (prefix handling for internal traffic) and PREOUT (prefix handling for outgoing traffic).

The modification can be activated for Called Party, Calling Party, Key Line, Mobil User Calling, Connected Party, Paying Party, Redirecting Party, Redirection Party, Transferring Party and for each type of call data recording (outgoing, incoming, internal). In this way it is possible to ensure that only certain numbers are modified.

AMO Interrelationships:

KNPRE (administer node prefix table)

GEFE (administer parameters for call data recording)

LDAT (administer LCR routes)

LODR (administer LCR outdial rules)

Device types:

Analog and networking trunks

18.8 DSDL - Don't send diversion LEG information

Feature:

Network-wide call forwarding and call forwarding no answer

Function:

Parameter **DSDL** can be used in the COT of a trunk to suppress the sending of protocol elements "Diversion Leg Information 1 to 3" to the partner system.

Information about the origin and destination of call forwarding is transferred in these protocol elements.

If a provider analyzes these elements and if it only permits call diversion, then call forwarding is not executed when encountered.

Without diversion LEG information, the remote side cannot recognize whether the call is one that has already been diverted. It can therefore perform another call forwarding operation for DSS1 (Digital Subscriber Signaling System No. 1) and Q-Sig -based protocols.

AMO Interrelationships:

PRODE ... Administer tables for the protocol handler

Device types:

Digital CO trunk circuits and interface circuits:

Protocol variants:

CorNet-N, Euro-ISDN, ECMA-QSig, DPNSS

18.9 ICZL - Incoming call data recording by zone or from line

Feature:

Call Data Recording Enhancements (CDRe)

Call data recording

Function:

ICZL has no function at present because no carrier call data information is sent for incoming calls.

18.10 ICZO - Incoming call data recording by zone only

Feature:

Call Data Recording Enhancements (CDRe)

Call data recording

Function:

The COT parameter **ICZO** only activates incoming call data recording on the line. Charging takes place in accordance with set zone and time tariffs.

ICZL has no function at present because no carrier call data information is sent for incoming calls.

AMO Interrelationships:

FEASU: TYPE=free, LM=<record cdric charges for incoming network and trunk traffic>

GEFE (administer parameters for call data recording):

ATTNDINC = Chargeable to switch/secretary in the case of incoming calls
ATTNDOUT = Chargeable to switch secretary in the case of outgoing calls

Device types:

Analog and digital trunks

Protocol variants:

All protocol variants

18.11 IICB - Ignore incoming billing information element

Feature:

Call Data Recording Enhancements (CDRe)

Function:

COT parameter **IICB** is used to control the analysis of the incoming billing information element in the receiver node.

If the parameter is activated in the COT of a trunk, then the incoming data of the billing information element is discarded.

If the incoming data of the billing information element is to be analyzed, stored and forwarded to call data recording, then the IICB parameter must **not** be set in the COT of a record.

Cost unit and control information for network-wide call data recording is transported from node to node in the billing information element. The NOTRANS parameter is used to deactivate call data recording in all transit notes of the route, only on the breakout trunk to CO a record is created.

If **NOTRANS** is used in the network IICB must not be set.

IMPORTANT: Do not set IICB in conjunction with PINNW (PIN network-wide). The parameter should always be set for digital tie trunk circuits and interface circuits for Hicom 300 nodes less than Hicom 300 E V1.0.

AMO Interrelationships:

COT: SNBE .... Send no outgoing billing information elements to the partner node

LDAT administration of LCR routes ... LATTR (LCR attribute)= ... NOTRANS

Device types:

Digital tie trunk circuits and interface circuits:

Protocol variants:

ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC)

18.12 LWNC - Line protocol without node number

Feature:

Display modification

Prevention of network loops and illegal connections

Function:

Systems that do not understand node numbers should always be assigned COT parameter **LWNC** in the trunks leading to them.

On the outgoing route, the parameter always prevents the transfer of node numbers to the remote system. And in the incoming direction, the **LWNC** parameter only works if the DFNN parameter is not set.

If no node number can be derived from an incoming calling number (for which the associated source node number is missing) then, when LWCN is set, the source node number is taken to be the node number of the trunk or, when LWCN is not set, the source node number is taken to be the user's own node number set up with ZAND for display modification or for the prevention of network loops and illegal connections.

AMO Interrelationships:

IMPORTANT: If the **LWNC** and **DFNN** parameters are set at the same time, then **DFNN** deactivates the function of **LWNC** in the incoming direction, but not in the outgoing direction.

COT= SATC Satellite counter administration, **COT**=ATRS Transit counter administration, **TDCSU**, **TACSU**, **ZAND**

Device types:

Analog and networking trunks

Protocol variants:

Analog and digital protocols

18.13 NCDR - No CDR-E-specific signaling messages to partner node

Feature:

Call Data Recording Enhancements (CDRe)

Function:

Network-wide control of CDRe data signaling messages (operations) that relate to the inclusion and removal of ATND-AO calls.

The COT parameter **NCDR** can be used to influence the transfer of such messages.

COT parameter NCDR set: CDRe data operations are not transferred to the partner node. If CDRe data is the only operation in a message, then this message is not sent at all.

COT parameter NCDR not set: CDRe data operations are transferred to the partner node.

AMO Interrelationships:

FEASU ... CDRE feature .... Enable call data recording enhancements

Device types:

Digital tie trunk circuits and interface circuits:

Protocol variants:

ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC)

18.14 NCHD - No charge data during call

Feature:

Advice of Charge Supplementary Services (AOC)

Function:

The service element AOC deals with non-service-dependent payment information. The COT parameter **NCHD** can be used to control the forwarding of such information (AOC operations).

NCHD set: The partner system receives no call data information during the call. The call data information is forwarded at the end of the connection with AOC-E.

NCHD not set: All AOC operations are forwarded to the partner system.

Device types:

Digital CO trunk circuits, interface circuits and tie trunk circuits

Protocol variants:

For example, ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC), Euro-ISDN

18.15 SNBE - Send no billing element to the partner system

Feature:

Call Data Recording Enhancements (CDRe)

Function:

COT parameter **SNBE** is used to control the forwarding of the billing information element to the partner node.

If the parameter is **activated** in the COT of a trunk, then no billing information element is sent to the partner system.

If the parameter is **deactivated** in the COT of a trunk, then the billing information element is sent to the partner system.

Cost unit and control information for network-wide call data recording is transported from node to node in the billing information element.

The **NOTRANS** parameter is used to deactivate call data recording in all transit notes of the route, only on the breakout trunk to CO a record is created.

If **NOTRANS** is used in the network **SNBE** must not be set.

IMPORTANT: Do not set **SNBE** in conjunction with **PINNW** (PIN network-wide). The parameter should always be set for digital tie trunk circuits and interface circuits for Hicom 300 nodes less than Hicom 300 E V1.0.

AMO Interrelationships:

COT: IICB .... Ignore incoming billing information elements from a line

LDAT administration of LCR routes ... LATTR (LCR attribute)= ... NOTRANS

Device types:

Digital tie trunk circuits and interface circuits.

Protocol variants:

ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC)

18.16 TRSC - Trunk sends call charges to source node

Feature:

Call data recording

Function:

If the network nodes have different ZAND settings CDDISPEX (unit/charge), then a COT with/without TRSC parameter is to be set up in the trunks in the transit nodes.

If **TRSC is set**, only charges are sent on this line in the direction of the source node which can be displayed there, e.g. without ongoing call data recording.

If **TRSC is not set**, then units are sent.

This parameter only works for transit lines that have arisen via digital trunks due to forward or transfer seizures from consultation calls.

AMO Interrelationships:

ZAND <TYPE=CDD, CDDISPEX ... Type of call charge display on terminal = AMOUNT (amounts on terminal... TRSC set) or = UNIT (units on terminal.... TRSC not set) >

Device types:

Digital tie trunk circuits and interface circuits:

Protocol variants:

For example, CORNV33, ECMAV2 (CorNet-NQ Issue 2.1 Dec.96 Basic ETSI), PSS1V2 (CorNet-NQ Issue 2.1 Dec.96 Basic ISO/IEC), Euro-ISDN

Index

A

AC
  code calling 1341
Alpha tagging 1046
analog station
  charge pulse metering 826
  charge pulse sending 826
autoset relocate
  sign off 1012

C

Call barring 1046
CHESE
  function key
    executive 886
    secretary 886
COT parameter
  DFNN 1677
CUG (Customer Group) 303

D

DID (Direct Inward Dialing) 1106
DIDCR (Direct Inward Dialing Digit Conversion) 1106
DNI (Directory Number Identification) 1106

G

GDTR (General Digit Translation) 1106
GDTRSR (General Digit Translation Service Rule) 1106

I

INCDR
  AOC (Advice of Charge) 741
  charge pulse metering
    analog station 826
  charge pulse sending
    analog station 826
  COT parameter
    DFNN 1677
  data output
    immediate to Magnetic Tape Device 787
    immediate to optional device 789
    on demand
      one-time order 708
      periodic order 708
  default values 834
  DPS interface 838
  INFO 2000 840
  invoicing
    per second 841
  outcall 840
  station number modification 864

K

key
  buzz 1024

M

MSN
  assigning a number (FBUS) 1158
  assigning a number (MBUS) 1157
  authorization 1158
  number programming 1159

N

night options
  universal answer 1369
number conversion
  combination code 1009
number identification
  central office 1184
  MFC-R2 1184

O

OPS (Off Premises Station) 1104
option index
  assigning an index 1153
option table
  modifying an option 1153

P

paging system (see "attendant console > code calling") 1341

S

S0/S2 trunk parametrization
  reference clock supply 584
speaker function (U.S.) 1229
system
  shared 303

V

voice call function (international market) 1229

© 2025 Mitel Networks Corporation. All Rights Reserved. Mitel and the Mitel logo are trademark(s) of Mitel Networks Corporation. Unify and associated marks are trademarks of Unify Software and Solutions GmbH & Co. KG. All other trademarks herein are the property of their respective owners.