Critical Release Notice

Publication number: 297-8021-350
Publication release: Standard 19.05

The content of this customer NTP supports the SN09 (DMS) software release.

Bookmarks used in this NTP highlight the changes between the NA015 baseline and the current release. The bookmarks provided are color-coded to identify release-specific content changes. NTP volumes that do not contain bookmarks indicate that the NA015 baseline remains unchanged and is valid for the current release.

Bookmark Color Legend

Black: Applies to content for the NA015 baseline that is valid through the current release.

Red: Applies to new or modified content for NA017 that is valid through the current release.

Blue: Applies to new or modified content for NA018 (SN05 DMS) that is valid through the current release.

Green: Applies to new or modified content for SN06 (DMS) that is valid through the current release.

Purple: Applies to new or modified content for SN07 (DMS) that is valid through the current release.

Pink: Applies to new or modified content for SN08 (DMS) that is valid through the current release.

Orange: Applies to new or modified content for SN09 (DMS) that is valid through the current release.

Attention!
Adobe® Acrobat® Reader™ 5.0 or higher is required to view bookmarks in color.

Publication History

Note: *Refer to the NA015 baseline document for Publication History prior to the NA017 software release.*

January 2006

Standard release 19.05 for software release SN09 (DMS). Updates made for this release are shown below:

Volume 1-3

No changes

Volume 4

Section Channelized access on LPP/LIS, Datafilling table TRKMEM (Sheet 6 of 6), removed (TBD) from remote unit as required by CR Q01256730.

Volume 5-16

No changes

Volume 17

Section Universal Access to CLASS Features, RESOFC field, note added as required by CR Q01218960.

Section Call Forwarding Remote Activation, Limitations and Restrictions, bullet added as required by CR Q01168869.

Volume 18-25

No changes

September 2005

Standard release 19.04 for software release SN08 (DMS). Updates made for this release are shown below:

Volume 1

Section PRI trunk groups, Datafilling table TRKSGRP, L1Flags description corrected for Q01112597.

Volume 10

Section DMS-100 and Meridian 1 Options 11-81 datafill correlation, Table 15-2, L1Flags description corrected for Q01112597.

Volume 17

Call Forwarding Remote Activation, Speed Calling description corrected for Q01095576.

August 2005

Standard release 19.03 for software release SN08 (DMS). Updates made for this release are shown below:

Volume 9

Documentation correction in Call Forward/Interface Busy. CR Q01038988 was incorrectly referred to as CR Q01038999 in the March 2005 documentation release. This has been corrected in the History section for Call Forward/Interface Busy, and in this Critical Release Notice.

Volume 14

Changes made to Residential Call Hold. "Table flow for Residential Call Hold (RCHD)" amended. (Q01038649)

June 2005

Standard release 19.02 for software release SN08 (DMS). Updates made for this release are shown below:

Volume 14

Changes made to Group Intercom All Call (Q00100917)

Volume 16

Changes made to Automatic Call Distribution (Q01091391)

March 2005

Preliminary release 19.01 for software release SN08 (DMS). Updates made for this release are shown below:

Volume 1-8

No changes

Volume 9

Modified – Call Forward/Interface Busy by CR Q01038988

Volume 10-25

No change

December 2004

Standard release 18.02 for software release SN07 (DMS). Updates made for this release are shown below:

Volume 1-12

No changes

Volume 13
Added Virtual Office Worker (VOW) by A00002011

Volume 14-16
No changes

Volume 17
Universal Access to Call Forwarding (UCFW) changes to AMA billing by CR Q00982215

Volume 18-23
No changes

Volume 24
Added OSSAIN XA-Core Data Messaging Capacity Enhancements by A00005160

Volume 25
No changes

September 2004

Preliminary release 18.01 for software release SN07 (DMS). Updates made for this release are shown below:

Volume 1
Modified – Introduction to trunk tables (ES trunk groups) by CR Q00838215-1

Volume 2-3
No changes

Volume 4
Modified – Datafilling Trunk Signaling (ISUP Hop Counter) by CR Q00760514-10

Volume 5-10
No changes

Volume 11
Modified – Datafilling MDC Minimum (Call Pickup) by CR Q00879738

Volume 12
Modified – Datafilling MDC MSAC (Do Not Disturb) by A00002196

Volume 13-15
No changes

Volume 16
Modified – Datafilling ACD Base (Base automatic call distribution) by CR Q00812364

Volume 17
Modified – Datafilling RES Advanced Custom Calling (900 FP) by CR Q00834222
Modified – Datafilling RES Advanced Custom Calling (CSMI) by CR Q00683891
Modified – Datafilling RES Advanced Custom Calling (CWAS) by CR Q00891675-01
Modified – Datafilling RES Advanced Custom Calling (Enhanced CSMI) by CR Q00683891

Volume 18
No changes

Volume 19
Modified – Datafilling RES Service Enablers (SLE) by CR Q00760256

Volume 20
Modified – Datafilling Emergency Number Services (E911 Wireless ALI Interface) by CR Q00856825

Volume 21-24
No changes

Volume 25
Modified – Datafilling Unbundling (UNBN OPTRANS and EA) by A00002765

March 2004

Standard release 17.03 for software release SN06 (DMS). Updates made for this release are shown below:

Volume 1- 9
No changes

Volume 10
Changes due to CR Q00757372 that clarify the applicability of the AUDTRMT option. The changes are in sections:

- 7 Datafilling NI0 NI-2 PRI, PRI Call Screening
- 8 Datafilling NI0 ISDN PRI Base, Flexible Digit Analysis
- 8 Datafilling NI0 ISDN PRI Base, PRI ISDN Treatments
- 9 Datafilling NI0 ISDN PRI CNAM, PRI SUSP for CNAME

Volume 11-16
No changes

Volume 17
Modified - Call Screening, Monitoring, and Intercept (CSMI) for Q00659151
Modified - RES Simultaneous Ringing for Q00715967
Modified - Usage Sensitive Three-way Calling (U3WC) for Q00703423-03

Volume 18
Changes to Chapter 1 - Datafilling RES Display Functionality and Privacy, Anonymous Caller Rejection (ACRJ) as follows:

- change to description of interaction with Call Forwarding Don't Answer (CFDA) for CR Q00773476
- change to description of interaction with SOC RES00011 for CR Q00735537.

Volume 19
Changes due to CR Q00735537, which shows the interaction of various services with SOC RES00011. The changes are in Chapter 1 – Datafilling RES non-display services, and the affected services are:

- Distinctive Ringing/Call Waiting (DRCW)
- Selective Call Acceptance (SCA)
- Selective Call Forwarding (SCF)
- Selective Call Rejection (SCJ)

Volume 20
Changes due to CR Q00757372, which clarifies the applicability of the AUDTRMT option. The changes are in section:

- 2 Datafilling Emergency Number Services, E911 PRI PSAP Delivery

Volume 21-25
No changes

September 2003

Standard release 17.02 for software release SN06 (DMS). Updates made for this release are shown below:

Volume 1
New - Panther support for third-party RMs
Modified - E911 trunk groups

Volume 2-11
No changes

Volume 12
Modified - Query Functional Station Grouping

Volume 13-14
No changes

Volume 15
Modified - VMX Interface

Volume 16
No changes

Volume 17
Modified - Call Screening, Monitoring, and Intercept (CSMI)
Modified - Enhanced CSMI
Modified - Long Distance Alerting
Modified - Long Distance Alerting Enhancement (LDAE)
Modified - Service Order Simplification for MADN Extension Bridging

Volume 18
Modified - Call Logging (CALLOG) Modified - Universal Voice Messaging
Modified - Voice Mail Easy Access (VMEA)

Volume 19
Modified - CMS AR Screening of Private Calls (CASOP)
Modified - In-Session Activation (ISA)

Volume 20
Modified - DMS Integrated E911 PSAP Functionality
Modified - E911 Incoming Wireless Calls
Modified - E911 Incoming Wireless Calls (MF)
Modified - E911 ISUP Parameter Enhancements
Modified - E911 ISUP Trunking
Modified - E911 Tandem
Modified - E911 Translations Robustness
Modified - VFG Support for E911 (LOC and/or ISUP/ANI Call)

Volume 21-25
No changes

June 2003

Preliminary release 17.01 for software release SN06 (DMS). Updates made for this release are shown below.

Volume 1-25
New Critical Release Notice added. Otherwise, no changes

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297-8021-350

DMS-100 Family

North American DMS-100

Translations Guide Volume 4 of 25

SS7 Datafill

LET0015 and up Standard 14.02 May 2001

NORTEL NETWORKS™

DMS-100 Family

North American DMS-100

Translations Guide Volume 4 of 25

SS7 Datafill

Publication number: 297-8021-350
Product release: LET0015 and up
Document release: Standard 14.02
Date: May 2001

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1 Datafilling Number Translation Services

This chapter provides information on datafilling Number Translation Services (NTS).

Functional groups for NTS

The NTS functional groups require the DMS SuperNode Platform—BASE0001, TEL00001, and BAS00003. The following paragraph provides the functional group name, ordering code and additional prerequisites for NTS.

NTS E800-CDN EOD, NTS00002

To operate, NTS E800-CDN EOD requires MDC Minimum, MDC00001.

NTS E800-US, NTS00005

To operate, NTS E800-US requires TEL CCS7 Base, TEL00008.

NTS E800VS-Canada, NTS00006

To operate, NTS E800VS-Canada requires TEL CCS7 Base, TEL00008.

NTS E800-CDN GTWY, NTS00014

NTS E800-CDN GTWY has no prerequisites.

NTS 800+E OCR No Answer

Ordering code

Functional group ordering code: NTS00006

Functionality ordering code: not applicable

Release applicability

DMS100NA03 and up

Prerequisites

To operate, NTS 800+E OCR No Answer requires the TE1 CCS7 Base, TEL00008 functional group.

Description

NTS 800+E OCR No Answer enables incoming 800 calls to continue to an overflow list when an answer indication is not received at the service switching point (SSP) from an end office (EO) of a terminating directory number (DN). The calls can overflow on either a call overflow on busy (COB) condition or a call overflow on no answer (CONA) condition for each DN in the overflow list.

Note: NTS 800+E OCR No Answer applies to the Stentor network.

Operation

The 800+E service provides overflow call routing (OCR) on a COB condition. This functionality increases the call completion rate by providing OCR for unanswered calls.

If the SSP does not receive an answer indication in a specified time period, NTS 800+E OCR No Answer routes incoming 800 calls to a list of four alternate DNs provided by the service control point (SCP). (The list of alternate DNs can include Canadian numbers, U. S. numbers, international numbers, or standard announcements.) If the first DN is busy, then the call proceeds to the next DN. This process is repeated until either the call is answered or the list is exhausted.

Overflow calls can result from either a COB condition or a CONA condition for each DN in the overflow list.

NTS 800+E OCR No Answer deletes option OCRTIME from table NSCDEFS (Number Service Code Database Response Timeouts) and introduces option CONATIM, which is the timeout value from 1 to 120 seconds to be used for CONA conditions.

NTS 800+E OCR No Answer (continued)

Call overflow on busy condition

The COB condition enables the SSP to overflow to the next terminating DN when a busy indication is received for a termination in the call overflow group.

Call overflow on no answer condition

The CONA condition enables the SSP to overflow to the next terminating DN when the specified time period has expired for the current terminating DN in the call overflow group.

The timeout period can be specified by the SCP in the transaction capabilities application part (TCAP) response message. If the value for the timeout period is not provided by the SCP, the specified value from table NSCDEFS is used. If the timeout period value is not provided by the SCP or table NSCDEFS is not datafilled, the default value of 20 seconds is used.

Exhaustion of all routes

Overflow call routing is deactivated if a routing component detects the Call Prompter (CP) feature or the Courtesy Response (CR) feature on an OCR terminating DN.

If the last routing component is an idle 10-digit POTS DN and CP or CR is not detected, the SSP can route the call to an office-wide announcement. The announcement is activated when the phone rings for 2 to 3 minutes or a busy tone results from an off-hook condition. (The length of time that must expire before the announcement is sent is determined by the local datafill of each switch and not set by this functionality.)

An office-wide announcement can occur regardless of whether CONA is enabled.

Note: Stentor does not require a special treatment at the SSP if all routes in the overflow list are exhausted.

Tones

The caller hears a ringing tone for all DNs in the overflow list except the last one. If an overflow call reaches the last DN, then the caller hears the state of the final DN (a ringing tone if it's idle).

The caller receives a busy tone only if all DNs in the overflow list are busy or the last DN is busy. If the last DN in the list is busy and there is no special overflow treatment at the SSP, the caller would first hear ringing and then busy treatment.

NTS 800+E OCR No Answer (continued)

Or the caller could first hear busy treatment and then ringing if a terminating agent does not return a busy indication message. Under this circumstance, OCR does not overflow until the no answer timer expires and the caller hears the state of the DN. This situation would occur when a busy DN is routed over an MF trunk. The caller hears busy tone for the duration of the no answer timer. When the timer expires, OCR overflows to the next DN and the caller hears ringing if the DN is idle.

TCAP response message

The TCAP response message contains the feature type indicator (FTI) flags for billing and overflow control and an optional CONA timer value for each DN in the overflow list.

Commands

Commands E800VER and TESTSS reflect FTI information. Instead of displaying the active status of the OCR, the status of both FTI flags (CONA and COB) is displayed.

Translations table flow

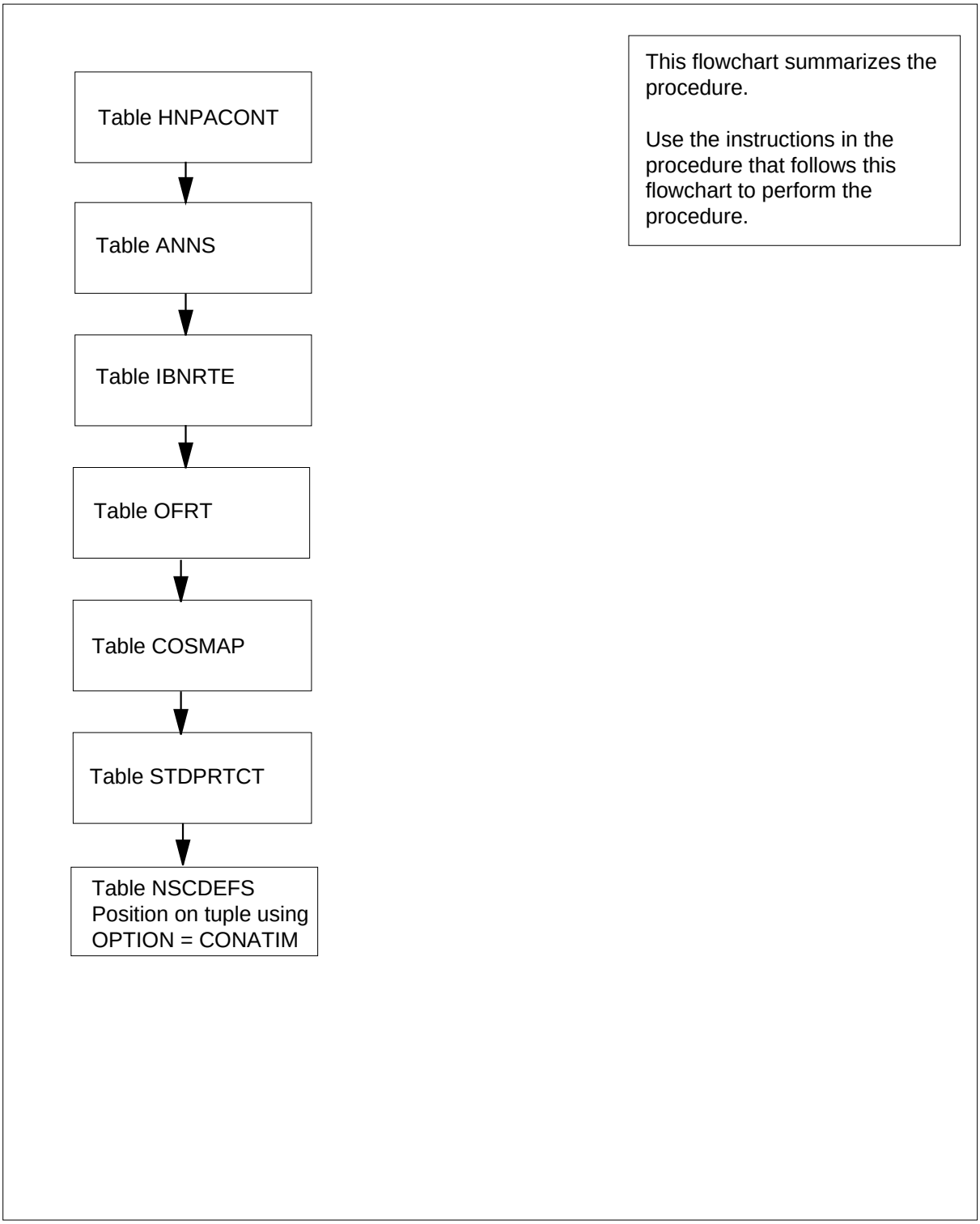
The NTS 800+E OCR No Answer translations tables are described in the following list:

- Table NSCDEFS lists the SSP options assigned to each number service code (NSC) service. Subfield CONATIM is used to determine the timeout value for a CONA condition.

The NTS 800+E OCR No Answer translation process is shown in the flowchart that follows.

NTS 800+E OCR No Answer (continued)

Table flow for NTS 800+E OCR No Answer



NTS 800+E OCR No Answer (continued)

The following table lists the datafill content used in the flowchart.

Datafill example for NTS 800+E OCR No Answer

Datafill table	Example data
NSCDEFS	800P 3 (NSCNUM 800) (CONATIM 100) $
Note: Tables HNPACONT (HNPA Code Subtable), ANNS (Announcement), IBNRTE (IBN Route), OFRT (Office Route), COSMAP (Network Class of Service Mapping) and STDPRTCT (List of Standard Pretranslation Tables) must be datafilled before table NSCDEFS.	

Limitations and restrictions

NTS 800+E OCR No Answer restricts certain routing types to the last routing component. If any of these routing types appear in the overflow list in a position other than the last one, the call routes as specified by that component and OCR halts. The component is then treated as the last routing component. The following routing types are restricted by this condition:

- 800 numbers (U. S. assigned)
- international DNs
- 10-digit POTS DNs with CP or CR
- special announcements
- transition numbers

Interactions

The following paragraphs describe the interactions between NTS 800+E OCR No Answer and other functionalities.

Automatic Call Distribution, uniform call distribution, hunt groups, direct inward system access and attendant console

Automatic Call Distribution (ACD), uniform call distribution (UCD), hunt groups, direct inward system access (DISA) and attendant consoles (AC) are considered to be customer premise equipment (CPE) by OCR. If a call terminates to one of these feature groups, which are local to the SSP, OCR considers the call to be answered and the call completes as a 800+E call without call overflow.

If any of these feature groups are not local to the SSP, then OCR continues until the call is answered, busy indication is received, or until the CONA timer expires. The call is taken down if the call is still being processed at the terminating switch when the timer expires.

Call Forwarding

Overflow call routing does not terminate on local DNs that are call forwarded to an 800 number. The call is overflowed to the next DN or terminates with a busy tone if the DN is the last in the routing list.

Call Forwarding Don't Answer

Overflow call routing takes precedence over Call Forwarding Don't Answer (CFD). Call Forwarding Don't Answer is restricted when the OCR timer expires during a CONA condition.

Traffic Operator Position System

NTS 800+E OCR No Answer does not support Traffic Operator Position System (TOPS). However, this functionality allows a call to be originated from a TOPS trunk agent.

Activation/deactivation by the end user

NTS 800+E OCR No Answer requires no activation or deactivation by the end user.

Billing

NTS 800+E OCR No Answer uses call code 142 and structure code 364. Call code 142 automatic message accounting (AMA) record provides information for operating company number service calls associated with the E800 service. This record includes the alternate billing number.

The following figure is an example of an AMA record generated for call code 142.

Call code 142

```
*HEX ID:AA STRUCT CODE:40364C CALL CODE 142C SENSOR
TYPE:036C SENSOR ID:0000000C REC OFFICE TYPE:036C REC
OFFICE ID:0000000C DATE:940314C TIMING IND:00000C STUDY
IND:0200000C CLD PTY OFF-HK:1C SERVICE OBSERVED:0C
OPER ACTION:0C SERVICE FEATURE:000C ORIG NPA:613C ORIG
NUMBER:7224111C
DIALED NPA:800C DIALED NUMBER:8110022C
OVERSEAS IND:0C TERM NPA:00613C TERM NUMBER:6216500C
CONNECT TIME:1800378C ELAPSED TIME:000000024C RAO
NUMBER:100C ORIGINATING LATA:000C MODULE CODE:304C
OUT-OF–BAND INDICATOR:0C
MODULE CODE:121C NUMBEER OF DESTINATIONS:3C
CAUSE OF OVERFLOW:03111C TYPE OF ANNOUNCEMENT:1C
MODULE CODE:031C FEATURE TYPE INDICATOR:4403000300000C
MODULE CODE:000C
```

NTS 800+E OCR No Answer (continued)

By themselves, call code 142 and structure code 364 do not contain any provision for OCR billing information. However, OCR uses FTI module code 31 and OCR information module code 121, both of which are appended to the AMA billing record.

Module code 31

Module code 31 is included in the AMA record if the TCAP response message from the SCP contains an FTI parameter. Module code 31 passes the data contained in the FTI TCAP parameter to the downstream billing processor.

NTS 800+E OCR No Answer uses all of the flags defined by module code 31.

The following table provides information for module code 31.

Module code 31

Information	Field number	Number of characters
Module code	88	4
Feature type indicator	71	14

Feature type indicator field

The FTI field contains a set of 12 feature indicators. Each indicator consists of two flags used to specify whether or not a particular feature is subscribed, and whether or not the feature is active. The setting of these flags is based on the data in the FTI TCAP parameter. Each flag pair from the FTI parameter is converted into a BCD character.

The following table provides information for data field 71.

Datafield 71 (Sheet 1 of 2)

Character	Value	Meaning
1	3, 4, 6, or 7	Dialed Number Identification
2	3, 4, 6, or 7	800 Caller Identification
Note: These characters define the status of a group of features. The possible values for each feature are as follows. The value 0 indicates the feature is not subscribed. The value 1 indicates the feature is never used. The value 2 indicates the feature is subscribed but not active. The value 3 indicates the feature is subscribed and active. The value 4 indicates the feature is not delivered. The value 6 indicates the feature is not delivered, but is subscribed. The value 7 indicates the feature is not delivered, but is subscribed and active.		

Datafield 71 (Sheet 2 of 2)

Character	Value	Meaning
3	0, 2, or 3	Command Routing
4	0, 2, or 3	Call Overflow on Busy
5	0, 2, or 3	Low Entry 800 Service
6	0, 2, or 3	Call Prompter (not used)
7	0, 2, or 3	Courtesy Response (not used)
8	0, 2, or 3	Call Overflow on No Answer
9 - 13	0	Unused storage for additional feature flags
14	Hex C	End-of-field marker (always set to the indicated value)
Note: These characters define the status of a group of features. The possible values for each feature are as follows. The value 0 indicates the feature is not subscribed. The value 1 indicates the feature is never used. The value 2 indicates the feature is subscribed but not active. The value 3 indicates the feature is subscribed and active. The value 4 indicates the feature is not delivered. The value 6 indicates the feature is not delivered, but is subscribed. The value 7 indicates the feature is not delivered, but is subscribed and active.		

Module code 121 - 800 OCR information

Module code 121 is included in the AMA record if the dialed 800 number subscribes to OCR. Module code 121 passes the overflow data collected during overflow processing to the billing processor.

The following table provides information for module code 121.

Module code 121

Information	Field number	Number of characters
Module code	88	4
Number of destinations	801	2
Cause of overflow	417	6
Type of announcement	418	2

NTS 800+E OCR No Answer (continued)

NTS 800+E OCR No Answer uses all of module code 121's fields except Type of Announcement, which is set to 1.

Number of destinations field

For module code 121, this field indicates the amount of routing numbers returned by the SCP in the database response message. The value for the number of destinations field ranges from 1 to 4.

The following table provides information for data field 801.

Data field 801

Character	Value	Meaning
1	1 - 4	Number of routing numbers in the SCP database response message
2	Hex C	End-of-field marker (always set to the indicated value)

Cause of overflow field

For module code 121, the value in this field indicates the possible reasons each 800 call overflowed. The cause of overflow field is six characters in length.

The following table provides information for data field 417.

Datafield 417 (Sheet 1 of 2)

Character	Value	Meaning
1	0	Filler character
2	1	Did not overflow to second routing number
	2	Overflowed to second routing number due to busy indication
	3	Overflowed to second routing number due to timeout before answer indication
3	1	Did not overflow to third routing number
	2	Overflowed to second routing number due to busy indication
	3	Overflowed to second routing number due to busy indication
4	1	Did not overflow to fourth routing number

Datafield 417 (Sheet 2 of 2)

Character	Value	Meaning
	2	Overflowed to second routing number due to busy indication
	3	Overflowed to fourth routing number due to timeout before answer indication
5	1	Did not overflow past fourth route
6	Hex C	End-of-field marker

Type of announcement field

For module code 121, this field indicates the type of announcement to which the call was routed.

The following table provides information for data field 418.

Datafield 418

Character	Value	Meaning
1	1	The last component was not an announcement. Always set to 1 for Stentor.
2	Hex C	End-of-field marker

Structure code 364

The following table provides information for structure code 364.

Structure code 364 (Sheet 1 of 2)

Information	Field number
Record description word	000
Hexadecimal identifier	00
Structure code	0
Call type	1
Sensor type	2
Sensor identification	3
Recording office type	4

NTS 800+E OCR No Answer (continued)

Structure code 364 (Sheet 2 of 2)

Information	Field number
Recording office identification	5
Date of answer	6
Timing indicator	7
Study indicator	8
Answer indicator	9
Service observed, traffic sampled	10
Operator action	11
Service feature	12
Originating NPA	13
Originating number	14
Dialed NPA	13
Dialed number	15
Destination overseas indicator	16
Destination NPA	17
Answer time	18
Elapsed time	19
Customer's RAO number	46
Originating LATA	197

Station Message Detail Recording

NTS 800+E OCR No Answer does not affect Station Message Detail Recording.

Datafilling office parameters

NTS 800+E OCR No Answer does not affect office parameters.

NTS 800+E OCR No Answer (continued)

Datafill sequence

The following table lists the tables that require datafill to implement NTS 800+E OCR No Answer. The tables are listed in the order in which they are to be datafilled.

Datafill tables required for NTS 800+E OCR No Answer

Table	Purpose of table
NSCDEFS	Number Service Code Database Response Timeouts. This table lists the SSP options assigned to each number service code (NSC).

Datafilling table NSCDEFS

The following table shows the datafill specific to NTS 800+E OCR No Answer for table NSCDEFS. Only those fields that apply directly to NTS 800+E OCR No Answer are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table NSCDEFS

Field	Subfield or refinement	Entry	Explanation and action
OPTIONS		see subfield	Options. This field consists of subfield OPTION and its refinements.
	OPTION	CONATIM	Option. This subfield specifies the option. Enter CONATIM to specify the timeout for a Call Over on No Answer condition.
	CONATIM	1 - 120 seconds	Call overflow on no answer timeouts. This subfield specifies the timeout value used for Call Overflow on No Answer in 1-second increments. Enter a value between 1 and 120 seconds.

Datafill example for table NSCDEFS

The following example shows sample datafill for table NSCDEFS.

NTS 800+E OCR No Answer (end)

MAP display example for table NSCDEFS

```
       NSCODE   TIMEOUT
                                                  OPTIONS
_____________________________________________________________________
       800P     3          ( NSCNUM 800)  ( CONATIM 100) $
```

Translation verification tools

NTS 800+E OCR No Answer does not use translation verification tools.

SERVORD

NTS 800+E OCR No Answer does not use SERVORD.

NTS CMS Restructure

Ordering codes

Functional group ordering code: NTS00002

Functionality ordering code: NTS00008

Release applicability

DMS100NA03 and up

Prerequisites

To operate, NTS CMS Restructure has the following prerequisites:

- MDC - MDC Minimum, MDC00001
- BAS Generic, BAS00003

Description

NTS CMS Restructure integrates options CID (Calling Number Identification) and DNID (Dialed Number Identification) into CLASS data structures for residential (RES)-specific lines. In addition, this functionality removes previously implemented in-line procedure hooks.

Note 1: NTS CMS Restructure works in conjunction with functionality *NTS per DN Subscription Controls*.

Note 2: NTS CMS Restructure applies to the Stentor network.

Note 3: The external symbols for options CID and DNID are NTS_CID and NTS_DNID, respectively. These external symbols are to be used when accessing line options in SERVORD and in datafilling table RESOFC (Residential Line CLASS Office Data) tuples.

Operation

NTS CMS Restructure integrates options CID and DNID into the CLASS data structures as RES-specific line options. Previously implemented in-line procedure hooks have been removed by NTS CMS Restructure.

The Service Order System (SERVORD) is used to add option CID or option DNID to a line.

Table RESOFC (Residential Line CLASS Office Data) determines whether line options CID and DNID are enabled or disabled for the entire office. The default value for both options is set to N when the package implementing CID and DNID is initialized. They are set to Y during dump and restore to maintain the same service provided as the customer group option in the previous batch change supplement (BCS).

NTS CMS Restructure (continued)

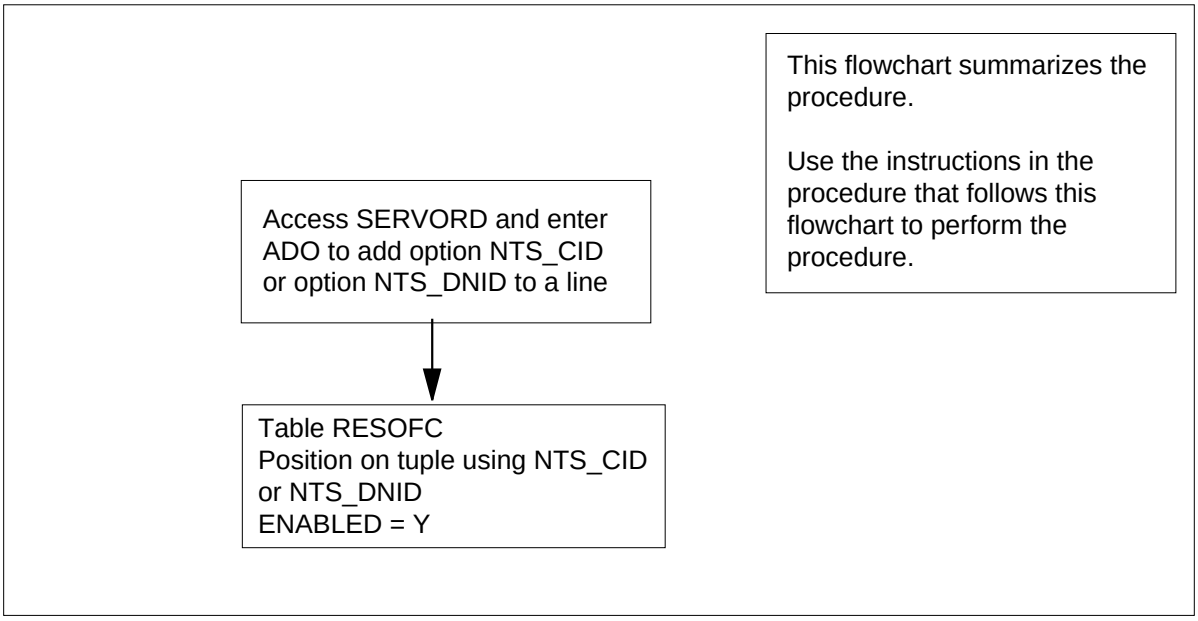
Translations table flow

The NTS CMS Restructure translations tables are described in the following list:

- Table IBNLINES (IBN Line Assignment) contains the line assignments for 500/2500 sets assigned to IBN and RES lines, and attendant console (AC) station numbers.
- Table RESOFC stores CLASS office data for each feature and controls whether line options CID and DNID are enabled or disabled. Tuples in table RESOFC can only be modified, not deleted.

The NTS CMS Restructure translation process is shown in the flowchart that follows.

Table flow for NTS CMS Restructure



The following table lists the datafill content used in the flowchart.

Datafill example for NTS CMS Restructure

Datafill table	Example data
IBNLINES	HOST 14 1 9 27 4 DT STN RES 5551234 100 (NTS_CID) (NTS_DNID) $
RESOFC	NTS_CID Y SUBSCR NTS_CID $NTS_DNID Y SUBSCR NTS_DNID $

Limitations and restrictions

The following limitations and restrictions apply to NTS CMS Restructure:

- The following functionalities are *not* supported by NTS CMS Restructure:
  - — Subscription Usage Sensitive Pricing (SUSP)/Automatic Message Accounting (AMA)
  - — Feature group options
- Option CID is available in a dialable directory number (DDN) format if, and only if, the DDN option is subscribed. Otherwise, the default CND is displayed.
- NTS CMS Restructure does not affect existing switch customer premises equipment (CPE) communication protocol (as specified in Bellcore standard TR-30).
- A minimum of one CMS TR-30 compliant terminal and a CLASS modem resource (CMR) card in the RES line peripherals are required.

Interactions

For the following functionality interactions, the connection from the originating end office (EO) to the service switching point (SSP) is over integrated services digital network (ISDN) user part (ISUP) trunks. The connection from the SSP to the terminating EO is over ISUP trunks and is in the Stentor network.

When applicable, the following conventions are used to identify the various parties involved in the specified call:

- The calling party is referred to as Party A.
- The called party is referred to as Party B.
- The party involved in the call as a result of a call redirection or call extension is referred to as Party C.

Also where applicable, the following 800Plus end office display (EOD) subscription rule determines the calling information displayed to the terminating party.

800Plus EOD subscription rule

If the subscription information obtained from the last service control point (SCP) query and the subscription information at the terminating EO both indicate CID and DNID subscription, then Party C has effective 800Plus EOD

NTS CMS Restructure (continued)

subscription for options CID and DNID. This subscription rule applies to the following call topologies:

- 800 calls redirected by using a non-800 number
- 800 calls redirected by using an 800 number
- non-800 call redirected by using an 800 number
- any other call topology that chains these three topologies

The following paragraphs describe the interactions between NTS CMS Restructure and other functionalities.

Anonymous Call Rejection

Options CID and DNID are not considered display options for 800 calls and non-800 calls in determining anonymous calls. 800 calls over trunks cannot terminate on a line with anonymous call rejection (ACRJ) but without 800Plus CID.

Bulk Calling Line Identification

A RES line in a Bulk Calling Line Identification (BCLID) group can have 800Plus CID and 800Plus DNID subscribed to it. When an 800 call terminates on the line with options CID and DNID, the 800 calling number identification and 800 dialed number identification are displayed, regardless of the BCLID group options. The CID and DNID are also displayed to the BCLID terminal if the BCLID group has options DNDISP and DSP800DN, regardless of the line's 800Plus CID and DNID options.

Call Forwarding Don't Answer, Call Forwarding Busy and Call Forwarding Universal

Calling information is displayed on the forwarding party's CPE while it is ringing.

In addition, the previously mentioned 800 EOD subscription rule and the following limitation for redirected calls (such as call forwarded calls) determine the calling information displayed to the terminating party.

Limitation for redirected calls

For redirected calls that involve more than one SCP query (that is, more than one leg of the calls is an 800 call), all SCP queries and the terminating EO should indicate subscription to 800Plus CID for effective 800Plus CID subscription.

NTS CMS Restructure (continued)

Calling Name Delivery, Calling Number Delivery, Dialable Number Delivery

Options CID and DNID and Calling Number Delivery (CND) (or Dialable Number Delivery [DDN]) and Calling Name Delivery (CNAMD) are compatible and subscribable. Options CID and DNID only apply to calls terminated on 800 numbers. The calling name is not displayed for 800 calls, regardless of CNAMD subscription. The CID subscriber does not view the calling party's number for non-800 calls unless the subscriber also has option CND. The CND subscriber does not view an 800 calling party's identification number unless the subscriber also has option CID.

If calling information is not available to a subscriber with only CND and CNAMD display, then the subscriber views the corresponding reason message display (regardless of whether the call is an 800 or a non-800 call). However, if only options CID and DNID are subscribed, the reason messages are displayed only for incoming 800 calls. The display is not updated for non-800 calls in this case.

Calling Number Delivery Blocking

Calling Number Delivery Blocking (CNDB) enables subscribers to control the display of their directory numbers (DN) on the sets of called parties on an individual call basis. Subscribers of CNDB also can use Calling Number Blocking (CNB) or Calling Name and Number Delivery Blocking (CNNB). The CID of the calling party is not displayed to the terminating party who has option CID for 800 calls if CNB or CNNB is activated by the originating party. The DNID of the called party is displayed even if blocking features, such as CNNB and Calling Name Delivery Blocking (CNAB), are activated by the originating party of an 800 calls.

Call pickup

Parties A and B are in the same call pickup (CPU) group and Party B receives an incoming call. Party A goes off-hook and dials the CPU access code to answer Party B's call. The Call Management Service (CMS) display information is not displayed on Party A's CPE with option CID or option DNID.

Call waiting

Call waiting (CWT) is activated while Party B is off-hook. The CMS display information for the incoming call is not transmitted to Party B's CPE with option CID or option DNID.

CLASS on Centrex

A CLASS on Centrex line can support options CID and DNID with or without any other CLASS display option.

NTS CMS Restructure (continued)

Multiline hunt

The 800Plus EOD subscription rule determines the display information for the terminating party for 800 calls.

Multiple Appearance Directory Number extension bridging

Both the primary and secondary members should have the same CID and DNID subscription for Multiple Appearance Directory Number (MADN) Extension Bridging (EXB) calls. Options CID and DNID are displayed to the secondary MADN members with or without other display options (CND, DDN or CNAMD).

Multiple Appearance Directory Number-multiple call arrangement

Multiple Appearance Directory Number-multiple call arrangement (MADN-MCA) is not compatible with options CID and DNID.

Multiple Appearance Directory Number-single call arrangement

NTS CMS Restructure supports Multiple Appearance Directory Number-single call arrangement (MADN-SCA). It is no longer necessary to include at least one CLASS display option (CND, DDN or CNAMD) for options CID and DNID to be displayed on CLASS on Centrex lines.

Secondary directory number (teen service)

The primary DN of a secondary directory number (SDN) feature (such as teen service) can have options CID and DNID subscribed to it. If a RES line receives an 800 call from a line with SDN, the CID of the primary DN is displayed.

Spontaneous Call Waiting Identification and Spontaneous Call Waiting Identification with Disposition

NTS CMS Restructure does not support Spontaneous Call Waiting Identification (SCWID) and SCWID with Disposition (DSCWID).

Three-way calling and call transfer

The CID and DNID that are displayed during a three-way call (3WC) or a call transfer (CXR) are that of the original calling party. When Party A calls Party B during an 800 call, the CID and DNID are displayed. The CID and DNID are still displayed when Party A has connected with Party C during the same 800 call while Party B is on hold. If Party A drops out of the call (that is, has executed a CXR) or executes a 3WC, neither Party B nor Party C views any updated calling information since both parties are off-hook.

The same result occurs if Party B is the party who executed a CXR or executes a 3WC (that is, neither Party A nor Party C views any updated calling information).

NTS CMS Restructure (continued)

Activation/deactivation by the end user

NTS CMS Restructure requires no activation or deactivation by the end user.

Billing

NTS CMS Restructure does not affect billing.

Station Message Detail Recording

NTS CMS Restructure does not affect Station Message Detail Recording.

Datafilling office parameters

NTS CMS Restructure does not affect office parameters.

Datafill sequence

The following table lists the tables that require datafill to implement NTS CMS Restructure. The tables are listed in the order in which they are to be datafilled.

Datafill tables required for NTS CMS Restructure

Table	Purpose of table
IBNLINES	IBN Line Assignment. This table contains the line assignments for all IBN and RES lines, and AC station numbers. ***Note:*** This table is datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill this table.
RESOFC	Residential Line CLASS Office Data. This table contains data on CLASS features and enables them for the office.

Datafilling table RESOFC

The following table shows the datafill specific to NTS CMS Restructure for table RESOFC. Only those fields that apply directly to NTS CMS Restructure

NTS CMS Restructure (continued)

are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table RESOFC

Field	Subfield or refinement	Entry	Explanation and action
KEY		see subfield	Key. This field consists of the subfield FEATNAME.
	FEATNAME	NTS_CID NTS_DNID	Feature name. This subfield is the key to the table. It specifies the name of the feature.
ENABLED		Y or N	Enabled. This field specifies whether or not the feature is enabled in the office. The default value is N. ***Note:*** The ENABLED entry is the only field the operating company can change for this functionality.
FEATDATA		see subfields	Feature data. This field consists of the subfields ACCESS and FEATNAME.
	ACCESS	SUBSCR or UNIVER	Feature access. This subfield specifies how the feature is accessed. SUBSCR indicates subscription access only and UNIVER indicates universal access for all RES lines. ***Note:*** The value UNIVER is not supported by this functionality.
	FEATNAME	NTS_CID NTS_DNID	Feature name. This subfield specifies the feature name.
FNALANN		$	Feature not allowed announcement. This field consists of subfields POTS_ACCESS and FNAL_CLLI. Enter $.

Datafill example for table RESOFC

The following example shows sample datafill for table RESOFC.

MAP display example for table RESOFC

```
KEY       ENABLED                                                FEATDATA
               FNALANN
_____________________________________________________________________
NTS_CID    Y                                SUBSCR      NTS_CID
               $
NTS_DNID Y                                  SUBSCR      NTS_DNID
               $
```

Translation verification tools

NTS CMS Restructure does not use translation verification tools.

SERVORD

SERVORD is used to assign options CID and DNID to RES lines. These options can be assigned to lines with a line class code (LCC) or RES or IBN, or to lines with an LCC of 1FR or 1MR when field RES_AS_POTS of office parameter RES_SO_SIMPLIFICATION in table OFCVAR (Variable Office Parameter) is set to Y.

SERVORD limitations and restrictions

The following SERVORD limitations and restrictions apply to NTS CMS Restructure:

- If option CID or option DNID is being added to a plain old telephone service (POTS) one-party flat rate (1FR) line, the line becomes a RES line if field RES_AS_POTS of office parameter RES_SO_SIMPLIFICATION in table OFCVAR had been set to Y. The following message is displayed at the completion of SERVORD datafill when line option CID or DNID is being added to a POTS 1FR line.

```
There is a RES specific option in the option set.
Line will become a RES line.
```

  Similarly, a RES line becomes a POTS line if option CID or option DNID is being deleted from the last RES-specific option in a tuple. The following message is displayed at the completion of SERVORD datafill when line

NTS CMS Restructure (continued)

option CID or DNID is being deleted from a RES line and it is the last RES-specific option in the tuple.

```
No RES specific option left on line.
Line will become a POTS 1FR line.
```

- When adding options CID and DNID using the SERVORD command ADO (add option), the AMA suboption prompt BILLING_OPTION does not display, regardless of the setting for AMA option SUSP in table AMAOPTS (AMA Options).

SERVORD prompts

The following table shows the SERVORD prompts used to add NTS CMS Restructure to a line.

SERVORD prompts for NTS CMS Restructure

Prompt	Valid input	Explanation
DN_OR_LEN	7-digit DN or LEN	Specifies the 7-digit DN or LEN of the key set to be changed.
OPTION	NTS_CID NTS_DNID	Assigns 800 Calling Number Identification or 800 Dialed Number Identification to the RES line.

SERVORD example for adding NTS CMS Restructure

The following SERVORD example shows how NTS CMS Restructure is added to a line using the ADO command.

SERVORD example for NTS CMS Restructure in prompt mode

```
>ADO
SONUMBER: NOW 94 10 15 AM
>
DN_OR_LEN:
> 5551234
OPTION:
> NTS_CID
OPTION:
> NTS_DNID
OPTION:
> $
COMMAND AS ENTERED:
ADO NOW 94 10 15 AM 5551234 ( NTS_CID ) ( NTS_DNID ) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
```

NTS CMS Restructure (end)

SERVORD example for NTS CMS Restructure in no-prompt mode

```
>ADO $ 5551234 NTS_CID NTS_DNID $
```

Note: Table IBNLINES is automatically datafilled when line option CID or DNID is assigned to a RES line using SERVORD.

NTS per DN Subscription Controls

Ordering codes

Functional group ordering code: NTS00001

Functionality ordering code: NTS00007, NTS00008

Release applicability

DMS100NA03 and up

Prerequisites

To operate, NTS per DN Subscription Controls has the following prerequisites:

- MDC - MDC Minimum, MDC00001
- BAS Generic, BAS00003

Description

NTS per DN Subscription Controls introduces line options 800 Calling Number Identification (CID) and 800 Dialed Number Identification Delivery (DNID) for Meridian business set (MBS) and IBN lines. These line options are supported on Centrex, Automatic Call Distribution (ACD) and Call Management Service (CMS) lines for telephone sets with display capabilities (that is, sets that support the MBS switch customer premises equipment [CPE] protocol for ACD and Centrex lines, or the Bellcore standard TR-30 for CMS lines).

Previously, options CID and DNID were available only for customer groups through table CUSTSN (Customer Group Station Option). NTS per DN Subscription Controls replaces these customer group options with individual line subscription controls through table IBNLINES (IBN Line Assignment) and table KSETLINE (Business Set and Data Unit Line Assignment).

Note 1: NTS per DN Subscription Controls works in conjunction with functionality *NTS CMS Restructure*.

Note 2: NTS per DN Subscription Controls applies to the Stentor network.

Note 3: The external symbols for options CID and DNID are NTS_CID and NTS_DNID, respectively. These external symbols are to be used when accessing line options in SERVORD and table control.

Operation

NTS per DN Subscription Controls replaces customer group options CID and DNID with individual line option equivalents, CID and DNID.

NTS per DN Subscription Controls (continued)

Previously, options CID and DNID were provisioned on an individual customer group basis using the 800EOD group option in table CUSTSTN. Each directory number (DN) (primary or secondary) that required option CID or option DNID must have belonged to a customer group with that option.

In addition, this functionality provides the following capabilities:

- dump and restore to convert customer group options to individual DN subscription
- Service Order System (SERVORD) access

Note 1: Subscription for options CID and DNID occurs at the end office (EO) and at the service control point (SCP) for individual DNs. This functionality is only concerned with EO subscription. In general, the EO and SCP subscriptions should match.

Note 2: At the SCP, CID and DNID subscription for an ACD group pertains to the ACD group's DN. The primary directory number (PDN) for all ACD agents in the same ACD group should have the same CID and DNID subscription (which should match the SCP subscription).

Dump and restore

Table control can be used to change a DN's subscription to line options CID and DNID, which includes adding or deleting line options. NTS per DN Subscription Controls supplies table control with dump and restore support to convert existing Centrex, ACD and CMS customer group subscriptions to individual DN subscriptions.

The conversion from a residential enhanced services (RES) CMS or a Centrex customer group subscription to an individual DN subscription is transparent to the telco operator and occurs during the dump and restore portion of the one night batch change supplement (BCS) delivery process (ONP).

Existing customer group options are still visible at the MAP (maintenance and administration position) terminal level. However, any attempt to modify existing 800EOD tuples or add 800EOD tuples is rejected. An error message is displayed informing the user to use the line option equivalents. However, 800EOD tuples can be deleted by the telco operator after the ONP (as the customer group data is useless after the ONP). A warning message is displayed informing the user that the tuple cannot be added again.

Note 1: Only EO customer group subscription is checked during dump and restore.

NTS per DN Subscription Controls (continued)

Note 2: A DN in table LENLINES (Line Assignment) can be a member of a customer group with option CID or option DNID, or both. The restored DN cannot be subscribed to option CID or option DNID.

Note 3: If a line with customer group option CID or option DNID has the maximum number of line options on it, then the corresponding line option (CID or DNID) cannot be added. A warning message is displayed. Option DNID has priority over option CID if there is only room for one line option.

Note 4: If an office uses the NTS per DN Subscription Controls line options and upgrades to a software load with these line options, the customer group data is ignored during the ONP (if it still exists on the dump side).

Note 5: Even if an option is

Note 6: When the dump batch change supplement (BCS) uses line options CID and DNID, the CID and DNID tuples (in table RESOFC) exist in the former load. The enabled status of the tuples in the former load are maintained after the ONP.

Provisioning during dump and restore

Provisioning during dump and restore is *not* a recommended procedure and must be executed with caution.

The following rule should be observed during any provisioning (either SERVORD or table control) on the restore side during the data move portion of an ONP (that is, assuming the dump side uses customer group options and the restore side uses NTS per DN Subscription Controls options):

- If a line is subscribed to customer group option(s) CID or DNID, or both, these options are automatically added to the line and the following results occur:
  - — NTS per DN Subscription Controls options cannot be deleted from the line *during* the data move portion of the ONP. *After* the data move portion of the ONP, CID and DNID can be deleted.
  - — Adding a lines tuple with 19 or 20 options (providing none are CID or DNID) displays a warning message stating that CID and DNID cannot be added to the line due to exceeding the maximum number of options for a line.

    Note: Provisioning software intentionally counts several options as more than one option. Hence, the number of line options could, in fact, be less than 19.

The above rule does not apply if the dump side already used NTS per DN Subscription Controls.

NTS per DN Subscription Controls (continued)

CMS lines

During an ONP, a CMS customer group subscription is converted to an individual DN subscription only if the all of the following factors for the line are true:

- The line belongs to a RES CMS customer group with option(s) CID or DNID, or both
- The line has a line class code (LCC) of RES or IBN
- The line is not a CLASS on Centrex MADN-MCA member
- The line is associated with an access peripheral that supports a datafilled CLASS modem resource (CMR) card.

  If option CID or option DNID is being assigned to a line which is associated with an access peripheral that supports a CMR card, and the CMR card is not datafilled, a warning message is displayed through SERVORD. The datafill of the CMR card is not checked during dump and restore and no messages are displayed, or if the line option is added through table control.

ACD and Centrex lines

During an ONP, a Centrex customer group subscription is converted to an individual DN subscription only if the all of the following factors for the DN are true:

- It belongs to a Centrex customer group with option(s) CID or DNID, or both.
- It is associated with a telephone set with display capabilities such as an
  - NT4X20
  - M5209
  - M5212
  - M5312
  - M5317 ISDN MFT that emulates an M5312
  - M5208
  - M5216
  - M5316
  - M522 add-on unit

SERVORD access

NTS per DN Subscription Controls replaces customer group options CID and DNID in table CUSTSTN with individual DN subscription. Line options CID

NTS per DN Subscription Controls (continued)

and DNID are accessible through SERVORD to change a DN's subscriptions in table IBNLINES and table KSETLINE.

Command interpreter (CI) commands QDN (Query Directory Number), QLEN (Query Line Equipment Number), QDNWRK (Query Working Directory Number), QLENWRK (Query Working LEN) and QLT can be used to display line option CID and DNID EO subscription information on a DN.

The following is an example of displaying line equipment number information related to options CID and DNID using the query command QLEN.

```
>QLEN
DN OR LEN:
> HOST 00 0 0 13
------------------------------------------------------------
LEN: HOST 00 0 0 13
TYPE: MULTIPLE PARTY LINE
DIRECTORY NUMBER: 7223250
LINE CLASS CODE: IBN
CUSTGRP: COMKODAK
SIGNALLING TYPE: DIGITONE
LINE ATTRIBUTE INDEX: 16
CARDCODE 2X18AD GND N LOSS Y BNV NL MNO N
OPTIONS:
NTS_CID NTS_DNID $
------------------------------------------------------------
```

Translations table flow

The NTS per DN Subscription Controls translations tables are described in the following list:

- Table IBNLINES contains the line assignments for 500/2500 sets assigned to IBN lines, and attendant console (AC) station numbers.
- Table KSETLINE contains the DN appearances for business sets and data units.
- Table RESOFC stores RES and CLASS on Centrex office-wide data for each functionality and controls whether line options CID and DNID are enabled or disabled. Tuples in table RESOFC can only be modified, not deleted.

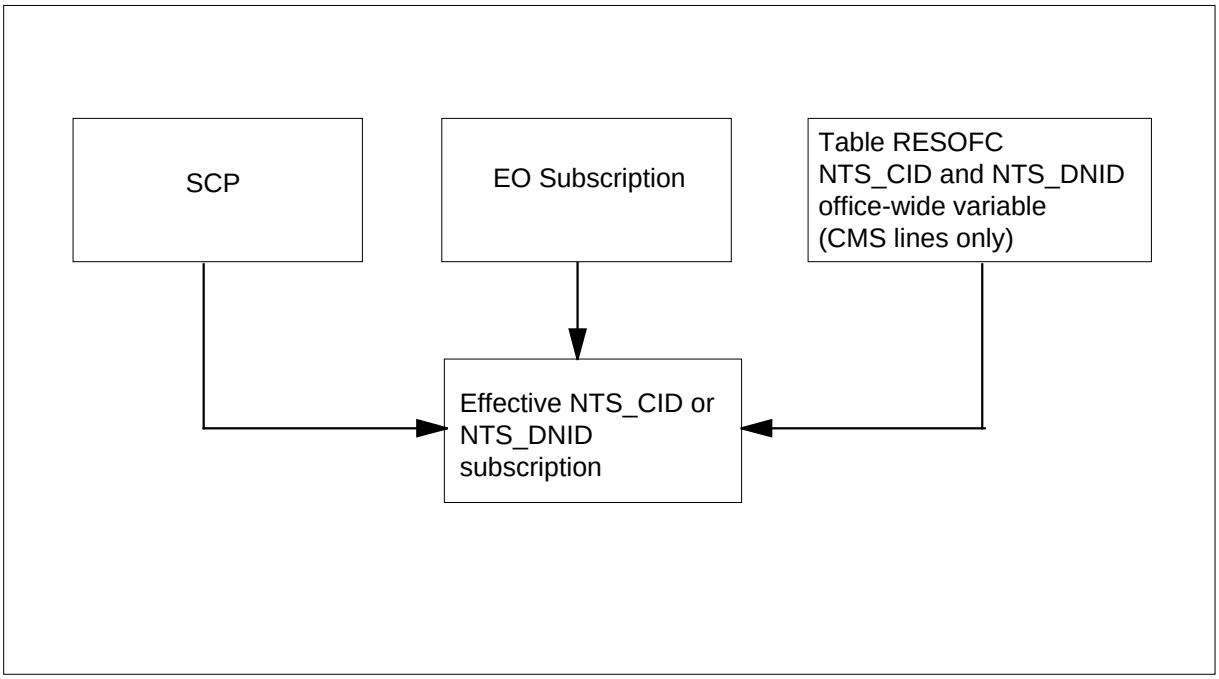
  When line option CID or option DNID is enabled, the 800Plus EOD CMS software is activated for that option. When line option CID or option DNID is disabled, the 800Plus EOD CMS software has no effect on 800

NTS per DN Subscription Controls (continued)

calls. (For example, a subscriber with Calling Number Delivery [CND] can view the calling number on an 800 call.)

The NTS per DN Subscription Controls translation process is shown in the flowchart that follows.

Table flow for NTS per DN Subscription Controls



The following table lists the datafill content used in the flowchart.

Datafill example for NTS per DN Subscription Controls

Datafill table	Example data
IBNLINES	HOST 14 1 9 27 DT STN IBN 5553250 (NTS_CID) $
KSETLINE	HOST 14 1 9 27 1 ACD Y 5553250 E911MDC1 0 0 919 (NTS_CID) CAG $
Note: Table RESOFC must be datafilled along with table IBNLINES for this functionality to work.	

NTS per DN Subscription Controls (continued)

Limitations and restrictions

The following limitations and restrictions apply to NTS per DN Subscription Controls:

- Only the Stentor network is affected by this functionality.
- For display purposes, CLASS on Centrex lines are treated as RES lines and are subject to the same restrictions. For example, CLASS display options are not allowed on multiple appearance directory number (MADN) multiple call arrangement (MCA) members. Therefore, options CID and DNID cannot be added to MADN-MCA members that are CLASS on Centrex lines.
- Provisioning during the data move portion of the ONP is *not* recommended.
- If a restart or switch of activity (SWACT) occurs during provisioning, NTS per DN Subscription Controls uses the existing methods of recovery provided by table control and SERVORD.
- NTS per DN Subscription Controls does not support the following functionalities:
  - — Feature groups
  - — Power features
  - — Customer data change
- NTS per DN Subscription Controls does not support functionalities that require a TR-575 compliant terminal, such as Spontaneous Call Waiting Identification (SCWID) and SCWID with Disposition (DSCWID).
- NTS per DN Subscription Controls does not support Subscriber User Sensitive Pricing (SUSP). (Automatic message accounting [AMA] billing is not prompted for when adding line options CID and DNID, even if SUSP is set to “ON" in table AMAOPTS [Automatic Message Accounting Options].)

Interactions

NTS per DN Subscription Controls has no functionality interactions.

Activation/deactivation by the end user

NTS per DN Subscription Controls requires no activation or deactivation by the end user.

Billing

NTS per DN Subscription Controls does not affect billing.

NTS per DN Subscription Controls (continued)

Station Message Detail Recording

NTS per DN Subscription Controls does not affect Station Message Detail Recording.

Datafilling office parameters

NTS per DN Subscription Controls does not affect office parameters.

Datafill sequence

The following table lists the tables that require datafill to implement NTS per DN Subscription Controls. The tables are listed in the order in which they are to be datafilled.

Note: These tables are datafilled through SERVORD; therefore, no datafill procedure or example is provided. Refer to “SERVORD" for an example of using SERVORD to datafill these tables.

Datafill tables required for NTS per DN Subscription Controls

Table	Purpose of table
IBNLINES	IBN Line Assignment. This table contains the line assignments for all IBN lines, and AC stations.
KSETLINE	Business Set and Data Unit Line Assignment. This table contains the DN appearances for business sets and data units. One entry is required for each DN related key on a business set and a data unit.

Translation verification tools

NTS per DN Subscription Controls does not use translation verification tools.

SERVORD

Line options CID and DNID are accessible through SERVORD to change a DN's subscriptions in table IBNLINES or table KSETLINE.

The following SERVORD commands are can be used to add, delete or change line options CID and DNID:

- ADD (add hunt and Call Pickup [CPU] members to a line)
- ADO (add option)
- CHG (change translation and routing information)
- DEO (delete option)
- EST (establish hunt or CPU group)

NTS per DN Subscription Controls (continued)

- NEW (establish service for all non-hunt lines)
- NEWACD (establish ACD business set)

SERVORD limitations and restrictions

The following SERVORD limitations and restrictions apply to NTS per DN Subscription Controls:

- If option CID or DNID is being added to a POTS one-party flat rate (1FR) line, the line becomes a RES line and is moved from table LENLINES to table IBNLINES. However, field RES_AS_POTS of office parameter RES_SO_SIMPLIFICATION in table OFCVAR (Variable Office Parameter) must be set to Y for this change to occur. (If RES_AS_POTS is set to N, SERVORD rejects the command.) The following message is displayed at the completion of SERVORD datafill when line option CID or DNID is being added to a POTS 1FR line.

```
There is a RES specific option in the option set.
Line will become a RES line.
```

- Similarly, if CID or DNID is the last RES-specific option in the tuple and is being deleted, the line is moved back to table LENLINES. The following message is displayed at the completion of SERVORD datafill when line option CID or DNID is being deleted from a RES line and it is the last RES-specific option in the tuple.

```
No RES specific option left on line.
Line will become a POTS 1FR line.
```

- For display to occur, the line must be associated with an access peripheral that supports a CMR card. If an attempt is made to assign CID or DNID to a line that is on a peripheral which does *not* support a CMR card, the assignment is rejected and the following error message is displayed.

```
CLASS DISPLAY OPTION NOT ALLOWED FOR LINES ON THIS
PERIPHERAL TYPE
```

- If CID or DNID is assigned to a line that is on a peripheral with a CMR card, but the card is *not* datafilled, the following warning message is displayed. The datafill of the CMR card is not checked if the line option is assigned through table control.

NTS per DN Subscription Controls (continued)

```
WARNING: DISPLAY OPTION ASSIGNED WITH NO CMR BOARD
DATAFILLED.
```

- CLASS display line options (including CID and DNID) cannot be assigned to on MADN-MCA members through SERVORD.

SERVORD prompts

The following table shows the SERVORD prompts used to assign CID and DNID to a line.

SERVORD prompts for NTS per DN Subscription Controls

Prompt	Valid input	Explanation
DN_OR_LEN	7-digit DN or LEN	Specifies the 7-digit DN or LEN of the key set to be changed.
OPTKEY	1-69 for MBS 1, 2, 3, 4, or 7 for data units	Identifies the key of MBS or data unit set to which an option is assigned.
OPTION	NTS_CID, NTS_DNID	Assigns 800 Calling Number Identification or 800 Dialed Number Identification Delivery to the line.

Note: The prompt OPTKEY does not display when accessing CMS lines.

SERVORD examples for adding NTS per DN Subscription Controls

The following SERVORD example shows how options CID and DNID are added to an ACD or Centrex line using the ADO command.

NTS per DN Subscription Controls (continued)

SERVORD example for NTS per DN Subscription Controls in prompt mode for an ACD or Centrex line

```
>ADO
SONUMBER: NOW 94 2 3 PM
>
DN_OR_LEN:
>5553250
OPTKEY:
> 1
OPTION:
> NTS_CID
OPTKEY:
> 1
OPTION:
> NTS_DNID
OPTKEY:
> $
COMMAND AS ENTERED:
ADO NOW 94 2 3 PM 5553250 ( 1 NTS_CID ) (1  NTS_DNID ) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
```

SERVORD example for NTS per DN Subscription Controls in no-prompt mode for an ACD or Centrex line

```
> ADO $ 5553250 1 NTS_CID  1 NTS_DNID  $
```

Note: Table KSETLINE is automatically datafilled when line option CID or DNID is assigned to an ACD or Centrex line using SERVORD.

The following SERVORD example shows how CID and DNID are added to a CMS line using the ADO command.

NTS per DN Subscription Controls (continued)

SERVORD example for NTS per DN Subscription Controls in prompt mode for a CMS line

```
>ADO
SONUMBER: NOW 94 2 3 PM
>
DN_OR_LEN:
>5553250
OPTION:
> NTS_CID
OPTION:
> NTS_DNID
OPTION:
> $
COMMAND AS ENTERED:
ADO NOW 94 2 3 PM 5550523 ( NTS_CID ) ( NTS_DNID ) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
```

SERVORD example for NTS per DN Subscription Controls in no-prompt mode for a CMS line

```
> ADO $ 5553250  NTS_CID  NTS_DNID $
```

Note: Table IBNLINES is automatically datafilled when line option CID or DNID is assigned to a CMS line using SERVORD.

SERVORD examples for deleting NTS per DN Subscription Controls

The following SERVORD example shows how CID is deleted from an ACD or Centrex line using the DEO command.

NTS per DN Subscription Controls (continued)

SERVORD example for NTS per DN Subscription Controls in prompt mode for an ACD or Centrex line

```
>DEO
SONUMBER: NOW 94 2 3 PM
>
DN_OR_LEN:
> 5553250
OPTKEY:
> 1
OPTION:
> NTS_CID
OPTKEY:
> $
COMMAND AS ENTERED:
DEO NOW 94 2 3 PM 5553250 (1 NTS_CID ) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
```

SERVORD example for NTS per DN Subscription Controls in no-prompt mode for an ACD or Centrex line

```
> DEO $ 5553250  1 NTS_CID  $
```

The following SERVORD example shows how CID and DNID are deleted from a CMS line using the DEO command.

SERVORD example for NTS per DN Subscription Controls in prompt mode for a CMS line

```
>DEO
SONUMBER: NOW 94 2 3 PM
>
DN_OR_LEN:
>5553250
OPTION:
> NTS_CID
OPTION:
> NTS_DNID
OPTION:
> $
COMMAND AS ENTERED:
DEO NOW 94 2 3 PM 5553250 ( NTS_CID ) ( NTS_DNID ) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
```

NTS per DN Subscription Controls (end)

SERVORD example for NTS per DN Subscription Controls in no-prompt mode for a CMS line

```
> DEO $ 5553250  NTS_CID  NTS_DNID $
```

2 Introduction to DMS SP/SSP

Understanding DMS SP/SSP translations

This chapter describes the tables datafilled in the DMS Signaling Point/Service Switching Point (DMS SP/SSP). The tables are classified under the following:

- CMS NAC Interface
- Channelized Access on LPP/LIS
- NPA Splits

The CMS NAC Interface package provides the signaling to support Custom Local Area Signaling Services (CLASS) features.

The Channelized Access package provides the maintenance and control software for the network interface unit (NIU).

NPA Splits introduces a new numbering plan (NPA) into an office.

Signaling for DMS SP/SSP

CCS7 trunk signaling

Preparing to datafill DMS SP/SSP

The following tables must be datafilled first:

- PMLOADS
- LIMINV
- SUSHELF
- LIMCDINV
- LIMPTINV
- LIUINV
- C7TIMER
- C7NETWRK
- C7LINK

- C7RTESET
- C7NETSSN
- C7RPLSSN
- C7GTTYPE
- C7GTT

Functional groups for DMS SP/SSP

The following paragraphs provide functional group names, ordering codes, and prerequisites for DMS SP/SSP.

DMS SP/SSP

To operate, SP/SSP requires the following functional groups:

- BAS00001
- TEL0001

Channelized access on LPP/LIS

Ordering codes

Functional group ordering code: TEL00001

Release applicability

TL02 and up

Prerequisites

To operate, Channelized access on LPP/LIS has the following prerequisites:

- BASE0001
- TEL00001

Description

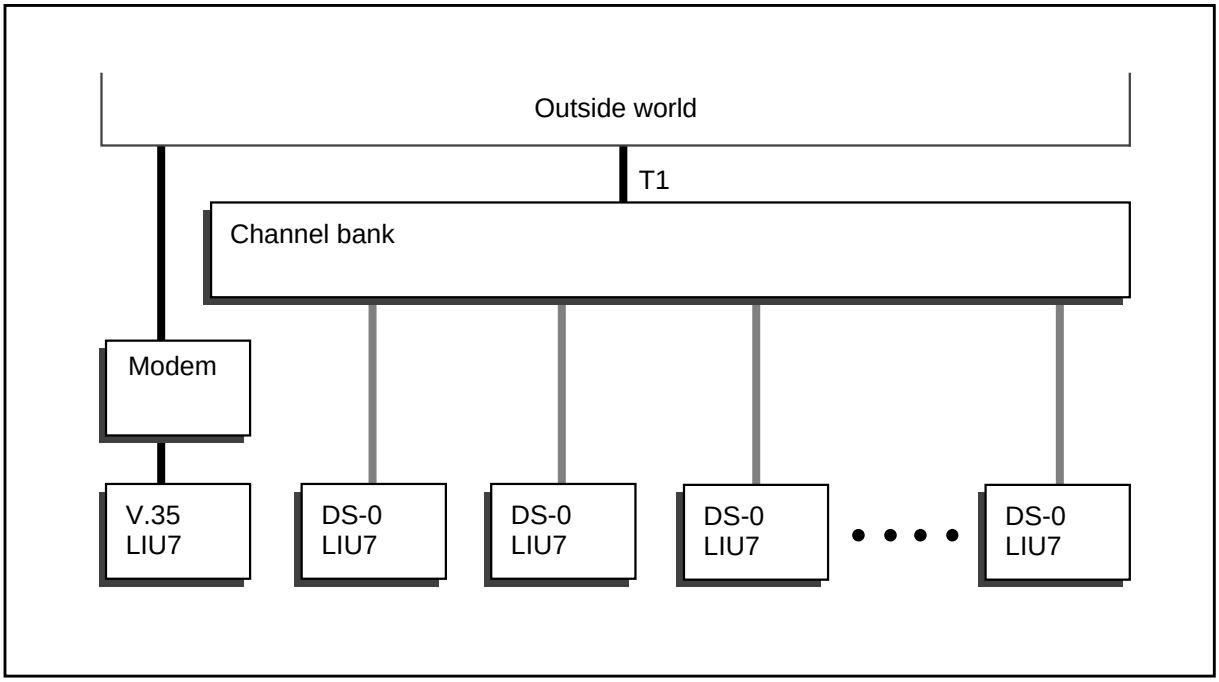
Channelized Access on LPP/LIS provides the maintenance and control software for the network interface unit (NIU). The NIU is a peripheral module (PM) housed in a link peripheral processor (LPP) that provides direct access from the DMS SuperNode network.

Channelized link access

As shown inthe following figure , non-channelized access connections between the CCS7 network and CCS7 link interface unit (LIU7) are set up over dedicated links through a carrier channel bank.

Channelized access on LPP/LIS (continued)

Non-channelized access link configuration

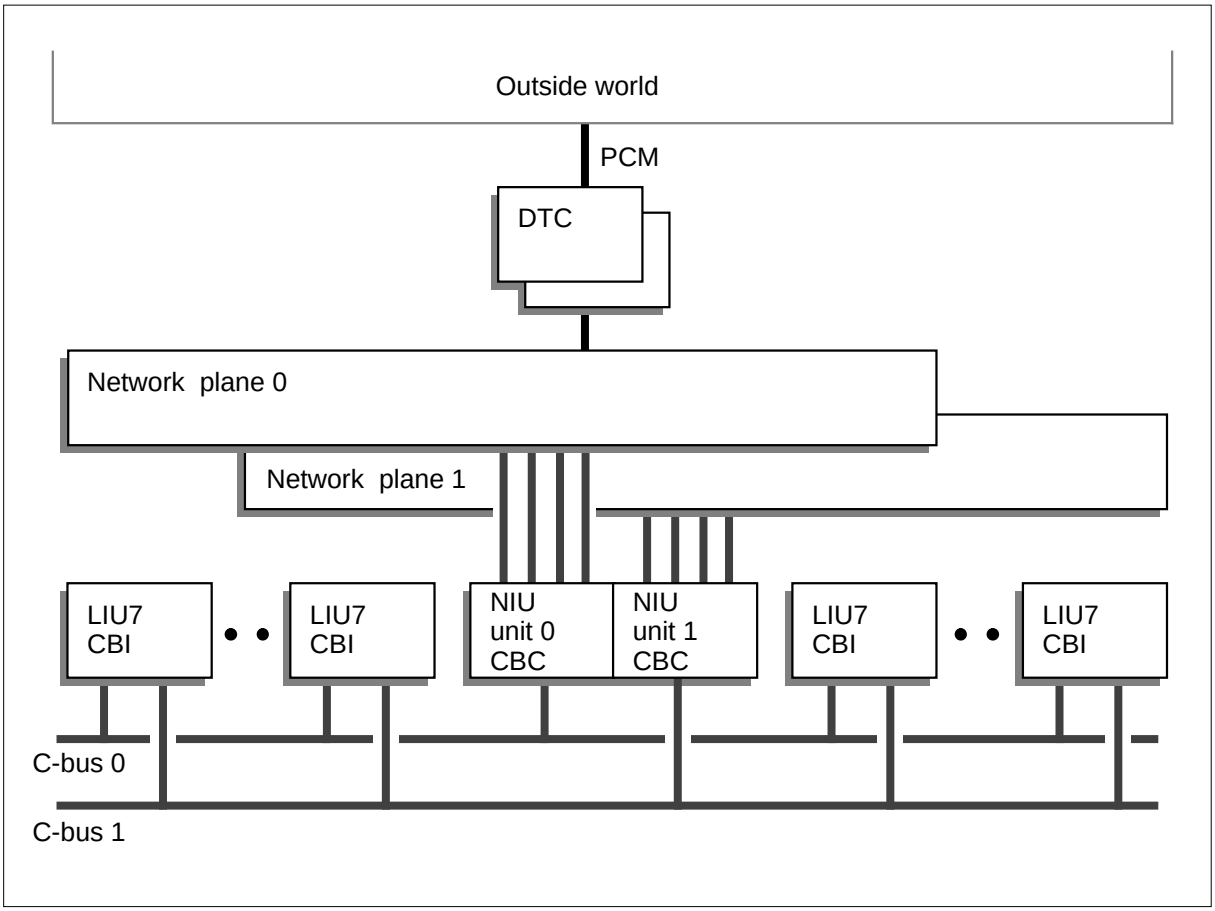


Channelized link access, as shown in the following figure , provides advantages by eliminating the need for external channel banks for DS-0 connections. Since channelized access hardware is associated with the LPP, it is only supported on SuperNode-based DMS switches.

The channelized link access feature only affects signaling access between the signaling data links and the LIU7. Messaging between the LIU7 and the link interface module (LIM) is unaffected.

Channelized access on LPP/LIS (continued)

Channelized access external interface configuration

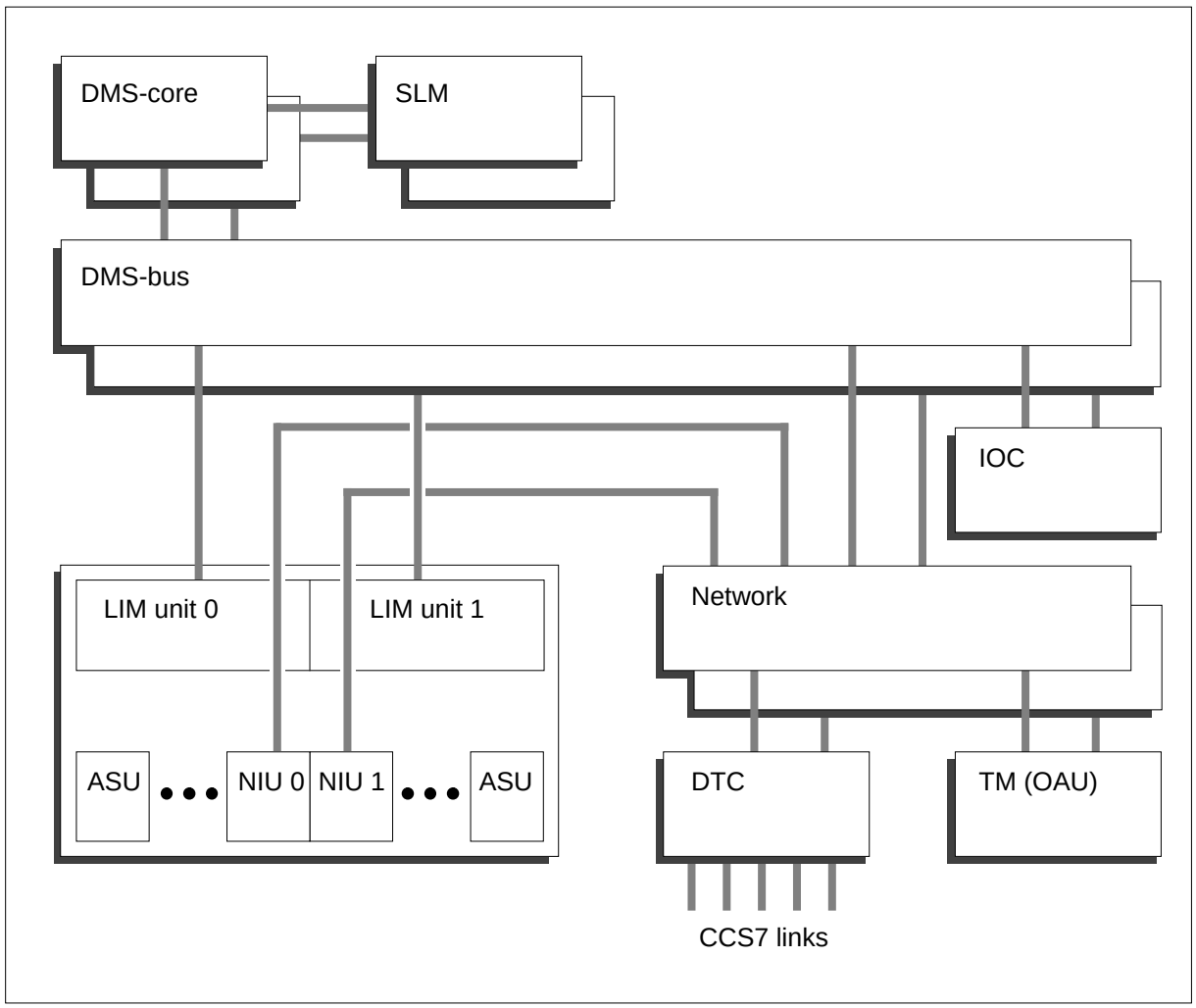


The following figure provides a more detailed overview of channelized link access modules, and shows the interconnection between the following DMS peripherals:

- digital trunk controller (DTC)
- switching network
- link interface shelves (LIS)
- channel access bus (C-bus)
- NIU
- LIU7

Channelized access on LPP/LIS (continued)

CCS7 channelized access system overview



Digital trunk controller

DTCs used for channelized link access are modified by datafill tables. Digital trunks and CCS7 links can both be supported by the same DTC.

Switching network

Channelized link access is compatible with both Junctor Networks (JNET) and Enhanced Networks (ENET). Nailed-up connections (NUC) between the DTC and NIU through the network are assigned in datafill tables. Four DS30 links are assigned for each NIU.

Link interface shelf

Channelized access reduces the capacity of a two-slot LIS from 12 to 10 LIU7s, and a three-slot LIS from 8 to 6 LIU7s.

Channelized access on LPP/LIS (continued)

Channel access bus

The C-bus, located on the backplane of each LIS, is a duplicated, time-division multiplexed bus operating at 4.096 MHz, and is arranged as 512 channels of 10 bits each. One duplicated C-bus for each LIS provides communication between all the ASUs on a shelf and the NIU.

Network interface unit

An NIU is a duplicated, warm-spared CCS7 peripheral module (PM) that is mounted on a LIS. It transfers data between the DMS network (junctor type or ENET) and the C-bus. The NIU acts as a switch by providing a maximum of 10 connection paths between the 512 channels available on the C-bus and the 120 channels available on the DS30 links from the DMS network. An NIU is provided on all LIS shelves where channel access is required.

An NIU consists of an integrated processor and F-bus interface (IPF), a channel bus controller (CBC), and a link interface paddle board (LPB) as follows:

- The IPF, NTEX22BB, is a general purpose MC68030-based processor board containing 8 Mbytes of memory for the local software load.
- The CBC card, NTEX25AA/AB contains integrated circuits that monitor and control transmission of data through the NIU.
- The LPB, NTEX28AA, interfaces with the DS30 datalinks (up to four) from the DMS network, and transmits data to both CBCs. The LPB also receives data from the CBCs, which is forwarded through the DMS network.

The same cards are used for both the two- and three-slot LISs.

Communication with each NIU is achieved as follows:

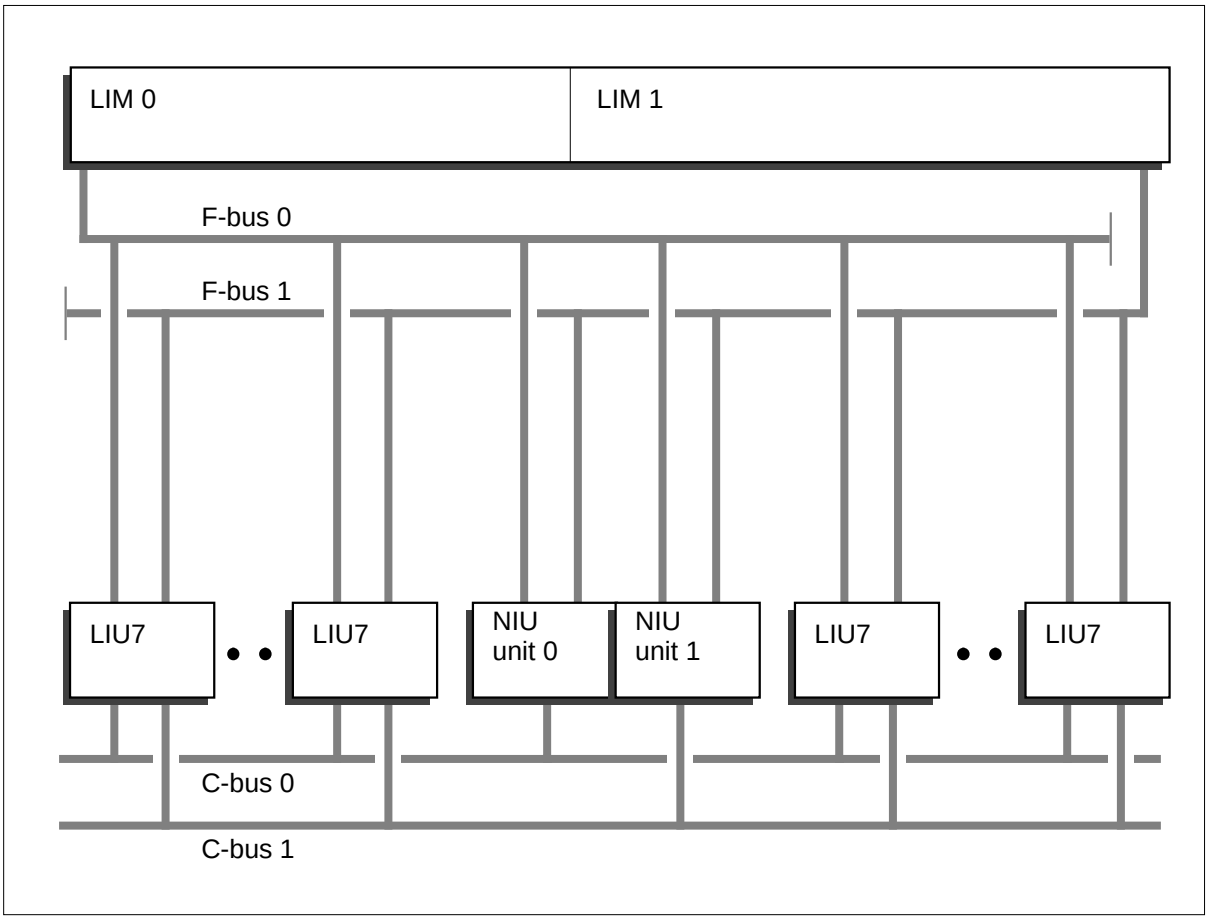
- The F-bus provides computing module (CM) to NIU communication. The NIU is reset and has operational software loaded through the F-bus. All maintenance messages to the NIU are sent on the F-bus.
- The DS30 links to a single plane of either an ENET or JNET. Each NIU transmits to and receives from the network a data stream identical to that received by its mate NIU.
- Connections are made to a unit's C-bus. NIU unit 0 controls C-bus 0, and NIU unit 1 controls C-bus 1.
- An inter-CBC cable connects to the mate NIU on the backplane. Access to the other network plane is achieved by this connection. This inter-CBC cable is also used to pass status information between the CBCs in order to perform activity switching.

Channelized access on LPP/LIS (continued)

CCS7 link interface unit

LIU7s are available as either two- or three-slot configurations. Both LIU7 configurations use the same ST card and DS-0A or V.35 paddle board. LIU7s associated with channelized link access are identical to those associated with non-channelized access, with the exception of the paddle board. Instead of a DS-0A or V.35 interface paddle board, a C-bus interface paddle board is required for channelized access. The NIU C-bus and F-bus connections are shown in the following figure .

NIU bus configuration



Operation

Table CARRMTC contains PM maintenance data. The PM type must be datafilled in this table before being entered in the inventory tables such as LTCINV and LTCPSINV.

The load files are datafilled in table PMLOADS and is then used in tables LTCINV, NIUINV, and LIUINV.

Channelized access on LPP/LIS (continued)

The trunk group is created in table TRKGRP and is identified by its common language location identifier (CLLI). This CLLI then appears in tables TRKSGRP, TRKMEM, and C7LINK.

Tables LIMINV and SUSHELF identify the location of the link interface module (LIM) and the LIU7.

The card information for the NIU and LIU7 is listed in tables NIUINV and LIUINV.

Table C7NETWRK describes the network types. C7LKSET defines the links between the adjacent nodes and names the linkset. The linkset is entered in table C7LINK, together with the LIU7 previously identified in table LIUINV.

Table C7RTESET associates the linksets to be used as possible routes for each signaling point. This table also provides alternate routing decisions.

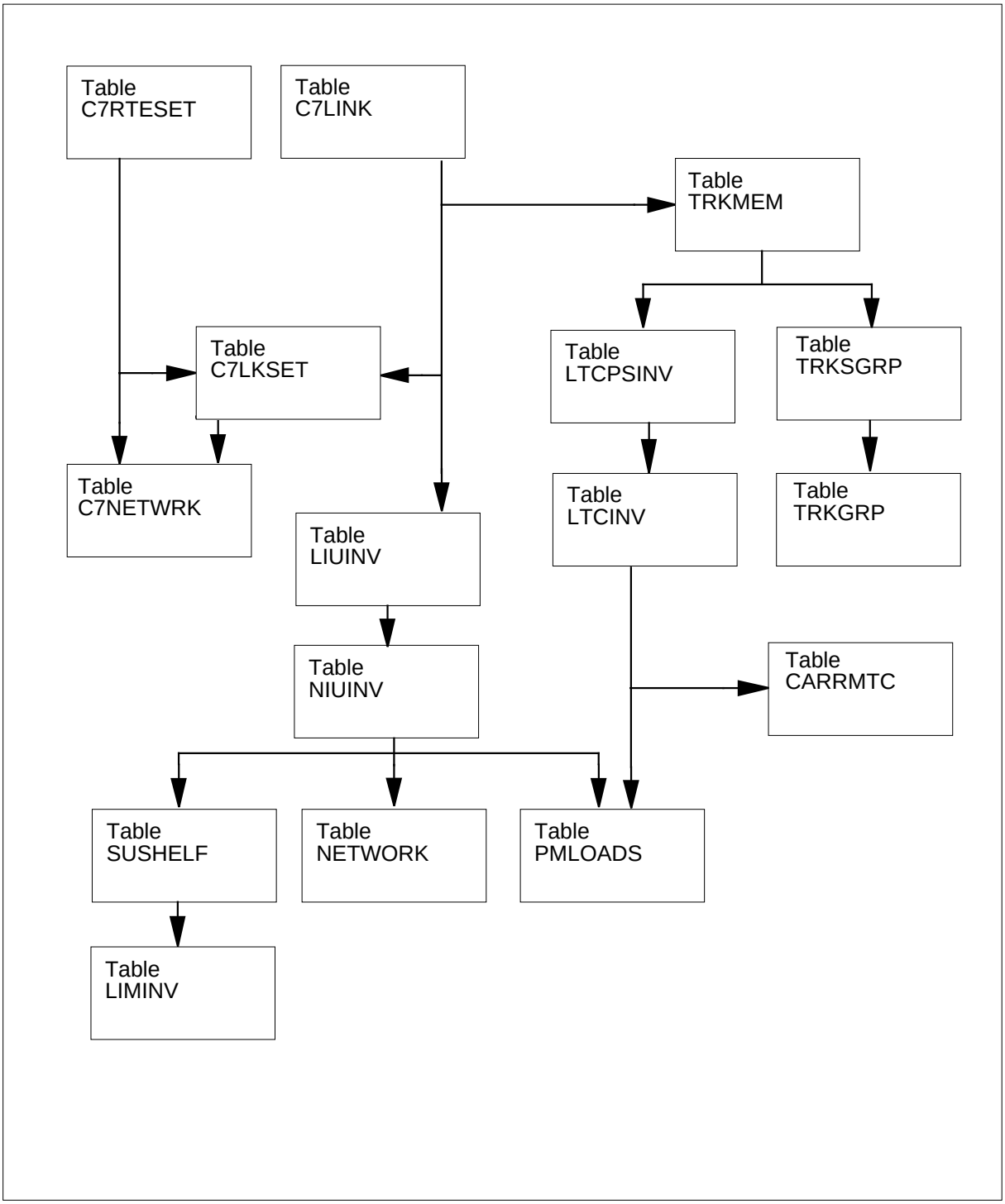
Translations table flow

The Channelized access on LPP/LIS translations tables are described in the following list:

- table C7RTESET
- table C7LINK
- table C7LKSET
- table C7NETWRK
- table LIUINV
- table NIUINV
- table NETWORK
- table SUSHELF
- table LIMINV
- table TRKMEM
- table TRKSGRP
- table TRKGRP
- table LTCPSINV
- table LTCINV
- table PMLOADS
- table CARRMTC

Channelized access on LPP/LIS (continued)

Table flow for Channelized access on LPP/LIS



Channelized access on LPP/LIS (continued)

The following table lists the datafill content used in the flowchart.

Datafill example for Channelized access on LPP/LIS

Datafill table	Example data
C7RTESET	CA_RS01 NATL_NET N ANSI7 (26) (27) (0) $ (CA_LS01 0) $
C7LINK	CA_LS01 0 LIUCHANNEL LIU7 204 CA_TRK 0 0 0 $
C7LKSET	CA_LS01 ALINK NATL_NET ANSI7 26 27 0 CA_LS01 N N Y 0 0 1
C7NETWRK	NATL_NET ANSI7 20 21 0 NATL Y Y 3 Y Y
LIUINV	LIU7 201 LIM 2 1 8 LPX36BF NTEX22BB NT9X76AA NTEX26AA $ 5600 ABI
NIUINV	1 LIM 2 1 NRS36BF NTEX22BB NTEX25AA NTEX28AANTEX22BB NTEX25BA NTEX28AA (1 3 1 9) (1 17 1 27) $
NETWORK	0 0 51 1 B 1 22 1 FSIZE 8X11AA
SUSHELF	LIM 2 12 0 1 1 A 0 LIM 0 26 NT9X72AA (7 NT9X74DA NT9X79AA)$ (32 NT9X74DA NT9X79AA)
LIMINV	2 1 A 0 LIM 500 LPX36BH NT9X70AA NT9X71AA 1.0
TRKMEM	CA_TRK 0 0 DTC 1 1 1
TRKSGRP	CA_TRK 0 DS1SIG STDTL UNEQ $
TRKGRP	CA_TRK TL 0 NPDGP NCRT
LTCPSINV	DTC 1 (0 DS1 DEFAULT N) (1 DS1 DEFAULT N) (2 DS1 DEFAULT N) (3 DS1 DEFAULT N) (4 DS1 DEFAULT N) (5 DS1 DEFAULT N) (6 NILTYPE) (7 NILTYPE) (8 NILTYPE) (9 NILTYPE) (10 NILTYPE) (11 NILTYPE) (12 NILTYPE) (13 NILTYPE) (14 NILTYPE) (15 NILTYPE) (16 NILTYPE) (17 NILTYPE) (18 NILTYPE) (19 NILTYPE) $
LTCINV	DTC 1 1001 DTE 5 54 3 B 5 6X02UA DC702BW (ABTRK DTCEX) $ (1 0) (1 8) (1 16) (1 24) $ (CONTINUITY) (MSG6X69) $ NORTHAM 6X45BA 6X45BA NILLOAD (CCS7) $ 6X40AC
PMLOADS	NRS36BF NRS36BF S01DIMAGE2 NRS36BF S01DIMAGE2 N
CARRMTC	DTC DEFAULT 255 255 DS1 NT6X50AA MU_LAW SF ZCS BPV NILDL N 250 1000 50 50 150 1000 3 6 864 100 17 511 4 255

Channelized access on LPP/LIS (continued)

Limitations and restrictions

The following limitations and restrictions apply to Channelized access on LPP/LIS:

- NIUs require that the NT9X74DA repeater be datafilled in the LIM or MS F-bus shelf.
- With an NIU present a shelf is limited to ten LIU7s.
- The maximum number of NIUs in an office is nine.
- If you try to busy an NIU when channels are still allocated by the application, a warning is displayed and you are prompted before you can continue.
- Broadcast loading is not supported.

Interactions

The following list describes the interactions between Channelized access on LPP/LIS and other functionalities.

- F-bus TAP maintenance and control
- LIM and LIU maintenance
- table control of tables SUSHELF and NETWORK
- base warm-spared MAP software
- integrated node (INode) maintenance
- Distributed Data Manager
- LIU7 Support for Channel Access Interface
- Local Maintenance and Diagnostics of NIU (also connection support)
- Channel Bus (C-bus) Maintenance
- NIU Central Maintenance

Activation/deactivation by the end user

Channelized access on LPP/LIS requires no activation or deactivation by the end user.

Billing

Channelized access on LPP/LIS does not affect billing.

Station Message Detail Recording

Channelized access on LPP/LIS does not affect Station Message Detail Recording.

Channelized access on LPP/LIS (continued)

Datafilling office parameters

Channelized access on LPP/LIS does not affect office parameters.

Datafill sequence

The following table lists the tables that require datafill to implement Channelized access on LPP/LIS. The tables are listed in the order in which they are to be datafilled.

Datafill tables required for Channelized access on LPP/LIS (Sheet 1 of 2)

Table	Purpose of table
CARRMTC	The carrier maintenance control table contains PM maintenance data.
PMLOADS	The peripheral module loads table stores the device location of each PM load file.
LTCINV	The line trunk controller inventory table contains inventory data for various PM types.
LTCPSINV	The line trunk controller p-side link inventory table contains the assignment of the p-side links for PMs.
TRKGRP	The trunk group table defines data associated with each trunk.
TRKSGRP	The trunk subgroup table specifies supplementary information for each trunk group.
TRKMEM	The trunk member table gives the physical location of each trunk.
LIMINV	The link interface module inventory table describes the location of each LIM in a building.
SUSHELF	The service unit shelf table identifies the LIU shelves to the controlling MS or LPP.
NETWORK	The network assignment table lists assignment data for each network frame.
NIUINV	The network interface unit inventory table describes the location, default load, cards, and links for each NIU.
LIUINV	The link interface unit inventory table holds the configuration data for each LIU in the LPP.
C7NETWRK	The CCS7 network table describes the signaling networks used by an installation.
C7LKSET	The CCS7 linkset table defines and configures the collection of links between two adjacent signaling points.

Channelized access on LPP/LIS (continued)

Datafill tables required for Channelized access on LPP/LIS (Sheet 2 of 2)

Table	Purpose of table
C7LINK	The CCS7 link table associates the physical aspects of a link with the logical view of a link as a member of a linkset.
C7RTESET	The CCS7 routeset table defines and configures a routeset.

Datafilling table CARRMTC

The following table shows the datafill specific to Channelized access on LPP/LIS for table CARRMTC. Only those fields that apply directly to Channelized access on LPP/LIS are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table CARRMTC (Sheet 1 of 8)

Field	Subfield or refinement	Entry	Explanation and action
CSPMTYPE		PDTC or DTC	C-side node peripheral module type. Enter the PM type of the node on the C-side of the carrier link.
TMPLTNM		alphanumeric (1 to 16 characters)	Template name. Enter a string of 1 to 16 alphanumeric characters to specify the template name of the PM. The default value is DEFAULT.
RTSML		numeric	Return to service maintenance limit. Enter the number of times in an audit interval a carrier can be returned to service by the system before a warning is issued. Value 255 disables this feature.
RTSOL		numeric	Return to service out of service limit. Enter the number of times in an audit interval a carrier may be returned to service by the system before it is permanently out of service. Value 255 disables this feature.
ATTR		see subfield	Attribute. This field consists of subfield SELECTOR.
	SELECTOR	D30 or DS1	Selector. Enter D30 if the entry for CSPMTYPE is PDTC. Enter DS1 if the entry for CSPMTYPE is DTC.
If the entry for SELECTOR is D30, complete field CARD and its refinements as listed below.			

Channelized access on LPP/LIS (continued)

Datafilling table CARRMTC (Sheet 2 of 8)

Field	Subfield or refinement	Entry	Explanation and action
	CARD	NT6X27AA NT6X27AB NT6X27AC NT6127SA NT6X27BA NT6X27BB or NTM82AA	Product engineering code (PEC) of card. Enter the PEC of the interface card used in the XPM PCM30 carrier for even bit inversion. The NT6X27AA, NT6X27AB and NT6X27AC are PCM30 interface cards. The NT6X27BA and NT6X27BB are enhanced PCM30 interface cards. The NTMX82AA is a dual PCM30 packlet card. The NT6127SA is for Austrian licensee use only. The default value for this field is NT6X27AA.
	VOICELAW	MU_LAW or A_LAW	Voice law. Enter the voice law used in the carrier. The default value for this field is A_LAW.
	NATLBIT	NATL or INTERNATL	National bit. If the national bit used is national, enter NATL. If the national bit used is international, enter INTERNATL.
	LLFAOST	numeric (0 to 255)	Local loss of frame alignment out of service time. Enter a number from 0 to 255 to specify the local loss of frame alignment out-of-service time limit.
	LLFARST	numeric (0 to 255)	Local loss of frame alignment return to service time. Enter a number from 0 to 255 to specify the local loss of frame alignment return-to-service time limit.
	LLFAML	numeric (0 to 255)	Local loss of frame alignment maintenance limit. Enter a number from 0 to 255 to specify the local loss of frame alignment maintenance limit.
	LLFAOL	numeric (0 to 255)	Local loss of frame alignment out of service. Enter a number from 0 to 255 to specify the local loss of frame alignment out-of-service limit.
	LLMAOST	numeric (0 to 255)	Local loss of multiframe alignment out of service. Enter a number from 0 to 255 to specify the local loss of multiframe alignment out-of-service time limit.

Channelized access on LPP/LIS (continued)

Datafilling table CARRMTC (Sheet 3 of 8)

Field	Subfield or refinement	Entry	Explanation and action
	LLMARST	numeric (0 to 255)	Local loss of multiframe alignment return to service. Enter a number from 0 to 255 to specify the local loss of multiframe alignment return-to-service time limit.
	LLMAML	numeric (0 to 255)	Local loss of multiframe alignment maintenance limit. Enter a number from 0 to 255 to specify the local loss of multiframe alignment maintenance limit.
	LLMAOL	numeric (0 to 255)	Local loss of multiframe alignement out of service. Enter a number from 0 to 255 to specify the local loss of multiframe alignment out-of-service limit.
	RFAIOST	numeric (0 to 255)	Remote frame alignment out of service. Enter a number from 0 to 255 to specify the remote frame alignment out-of-service time limit.
	RFAIRST	numeric (0 to 255)	Remote frame alignment return to service. Enter a number from 0 to 255 to specify the remote frame alignment return-to-service time limit.
	RFAIML	numeric (0 to 255)	Remote frame alignment maintenance limit. Enter a number from 0 to 255 to specify the remote frame alignment maintenance limit.
	RFAIOL	numeric (0 to 255)	Remote frame alignment out of service limit. Enter a number from 0 to 255 to specify the remote frame alignment out-of-service limit.
	RMAIOST	numeric (0 to 255)	Remote multiframe alignment out of service time. Enter a number from 0 to 255 to specify the remote multiframe alignment out-of-service time limit.
	RMAIRST	numeric (0 to 255)	Remote multiframe alignment return to service. Enter a number from 0 to 255 to specify the remote multiframe alignment return-to-service time limit.
	RMAIML	numeric (0 to 255)	Remote multiframe alignment maintenance limit. Enter a number from 0 to 255 to specify the remote multiframe alignment maintenance limit.

Channelized access on LPP/LIS (continued)

Datafilling table CARRMTC (Sheet 4 of 8)

Field	Subfield or refinement	Entry	Explanation and action
	RMAIOL	numeric (0 to 255)	Remote multiframe alignment out of service limit. Enter a number from 0 to 255 to specify the remote multiframe alignment out-of-service limit.
	AISOST	numeric (0 to 255)	Alarm indication signal out of service time. Enter a number from 0 to 255 to specify the alarm indication signal out-of-service time limit.
	AISRST	numeric (0 to 255)	Alarm indication signal return to service. Enter a number from 0 to 255 to specify the alarm indication signal return-to-service time limit.
	AISML	numeric (0 to 255)	Alarm indication signal maintenance limit. Enter a number from 0 to 255 to specify the alarm indication signal maintenance limit.
	AISOL	numeric (0 to 255)	Alarm indication signal out of service limit. Enter a number from 0 to 255 to specify the alarm indication signal out-of-service limit.
	BEROST	numeric (0 to 255)	Bit error rate out of service limit. Enter a number from 0 to 255 to specify the bit error rate out-of-service time limit.
	BERRST	numeric (0 to 255)	Bit error rate return to service time. Enter a number from 0 to 255 to specify the bit error rate return-to-service time limit.
	BERML	numeric (0 to 255)	Bit error rate maintenance limit. Enter a number from 0 to 255 to specify the bit error rate maintenance limit.
	BEROL	numeric (0 to 255)	Bit error rate out of service limit. Enter a number from 0 to 255 to specify the bit error rate out-of-service limit.
	SLIPML	numeric (0 to 255)	Slip maintenance limit. Enter a number from 0 to 255 to specify the number of slips that are accumulated by the PM within a 24-h or 1-min interval before a hit-state alarm for SLIP is raised.
	SLIPOL	numeric (0 to 255)	Slip out of service limit. Enter a number from 0 to 255 to specify the number of slips that are accumulated by the PM within a 24-h or 5-min interval before a hit-state alarm for SLIP is raised.

Channelized access on LPP/LIS (continued)

Datafilling table CARRMTC (Sheet 5 of 8)

Field	Subfield or refinement	Entry	Explanation and action
	SLIPSYNC	numeric (0 to 255)	Slip sync. Enter Y to indicate that the switch operates in a synchronized region and slips are accumulated over 24-h intervals. Enter N to indicate that the switch does not operate in a synchronized region and slips are accumulated over 1-min and 5-min intervals.
	AIS16OST	numeric (0 to 255)	Out of service time for AIS16 alarm. Enter a number from 0 to 255 to specify the AIS16 alarm out-of-service time. The default value is 4.
	AIS16RST	numeric (0 to 255)	Return to service timer of rAIS16 alarm. Enter a number from 0 to 255 to specify the AIS16 alarm return-to-service time limit. The default value is 4.
	AIS16ML	numeric (0 to 255)	Maintenance limit for AIS16 alarm. Enter a number from 0 to 255 to specify the AIS16 alarm maintenance limit. The default value is 17.
	AIS16OL	numeric (0 to 255)	Out of service limit for AIS16 alarm. Enter a number from 0 to 255 to specify the AIS16 alarm out-of-service limit. The default value is 255.
	CRC4	Y or N	Cyclic redundancy check 4. Enter Y to initiate the cyclic redundancy check (CRC) 4. The default value is N and no CRC4 check is initiated.
	CRE	Y or N	CRE procedure. Enter Y to initiate the CRE procedure. The default value is N and no CRE check is initiated.
	CRC4OST	numeric (0 to 255)	Out of service time for CRC4 alarm. Enter a number from 0 to 255 to specify the CRC4 alarm out-of-service time. The default value is 5.
	CRC4RST	numeric (0 to 255)	Return to service time for CRC4 alarm. Enter a number from 0 to 255 to specify the CRC4 alarm return-to-service time. The default value is 5.
	CRC4ML	numeric (0 to 1023)	Maintenance limit for CRC4 alarm Enter a number from 0 to 1023 to specify the CRC4 alarm maintenance limit. The default value is 205.

Channelized access on LPP/LIS (continued)

Datafilling table CARRMTC (Sheet 6 of 8)

Field	Subfield or refinement	Entry	Explanation and action
	CRC4OL	numeric (0 to 1023)	Out of service for CRC4 alarm. Enter a number from 0 to 1023 to specify the AIS16 alarm out-of-service limit. The default value is 914.
	IDLECODE	G714 or Q503	Idle channel bit pattern. Enter G714 or Q503 to indicate the CCITT-recommended idle-channel bit pattern.
	SIGNTYPE	CCS	Signaling type. Enter CCS for Common Channel Signaling.
If the entry for SELECTOR is DS1, complete field CARD and its refinements as listed below.			
	CARD	NT6X50AA, NT6X55AB, NT6X55BA, or NT6X55JA	Card. Enter the PEC of the card used. If the PEC of the card is NT6X50AA, complete subfields VOICELAW, FF, ZLG, BERB, DLK, IAT, LCGAST, LCGACL, RCGAST, RCGACL, AISST, AISCL, BEROL, BERML, ES, SES, FRAMEML, FRAMEOL, SLIPML, and SLIPOL. If the PEC of the card is NT6X55AB or NT6X55BA, complete subfields RATE, CLOCK, LSC, IAT, LCGAST, LCGACL, BEROL, BERML, ES, SES, SLIPML, and SLIPOL. The NT6X55JA is for Japanese licensee use only. Complete subfields RATE, CLOCK, IAT, LCGAST, LCGACL, BEROL, BERML, ES, SES, SLIPML, SLIPOL, and CIICMI.
	VOICELAW	MU_LAW	Voice law. Enter MU_LAW.
	FF	SF or ESF	Frame format. For standard format, enter SF. For extended superframe format, enter ESF.
	ZLG	ZCS or B8ZS	Zero logic. For zero code suppression, enter ZCS. For bipolar 8-bits zero substitution, enter B8ZS.
	BERB	BPV or CRC	Bit error rate base. For bipolar violation, enter BPV. For cyclic redundancy code, enter CRC.
	DLK	NILDL	Data link. Enter NILDL.

Channelized access on LPP/LIS (continued)

Datafilling table CARRMTC (Sheet 7 of 8)

Field	Subfield or refinement	Entry	Explanation and action
	IAT	Y or N	Inhibit alarm transmit. Enter Y if the alarm transmit is inhibited. Otherwise, enter N.
	LCGAST	numeric (1 to 9999)	Local carrier group alarm set threshold. Enter a number from 1 to 9999 to specify the local carrier group alarm set threshold (in 10 ms).
	LCGACL	numeric (1 to 9999)	Local carrier group alarm clear threshold. Enter a number from 1 to 9999 to specify the local carrier group alarm clear threshold (in 10 ms).
	RCGAST	numeric (1 to 9999)	Remote carrier group alarm set threshold. Enter a number from 1 to 9999 to specify the carrier group alarm set threshold (in 10 ms).
	RCGACL	numeric (1 to 9999)	Remote carrier group alarm clear threshold. Enter a number from 1 to 9999 to specify the carrier group alarm clear threshold (in 10 ms).
	AISST	numeric (1 to 9999)	Alarm indication signal set threshold. Enter a number from 1 to 9999 to specify the alarm indication signal set threshold (in 10 ms).
	AISCL	numeric (1 to 9999)	Alarm indication signal clear threshold. Enter a number from 1 to 9999 to specify the alarm indication signal clear threshold (in 10 ms).
	BEROL	numeric (3 to 6)	Bit error rate out of service limit. Enter a number from 3 to 6 to specify the BER out-of-service limit.
	BERML	numeric (4 to 7)	Bit error rate maintenance limit. Enter a number from 4 to 7 to specify the BER maintenance limit.
	ES	numeric (0 to 9999)	Errored second threshold. Enter a number from 0 to 9999 to specify the error seconds threshold (in 10ms).
	SES	numeric (0 to 9999)	Servere errored second threshold. Enter a number from 0 to 9999 to specify the severe errored seconds threshold (in 10 ms).
	FRAMEML	numeric (0 to 9999)	Frame maintenance limit. Enter a number from 0 to 9999 to specify the maintenance limit for frame loss.

Channelized access on LPP/LIS (continued)

Datafilling table CARRMTC (Sheet 8 of 8)

Field	Subfield or refinement	Entry	Explanation and action
	FRAMEOL	numeric (0 to 9999)	Frame out of service limit. Enter a number from 0 to 9999 to specify the out-of-service limit for frame loss. The entry in subfield FRAMEOL must be greater than the entry in subfield FRAMEML. Otherwise, only subfield FRAMEOL is used.
	SLIPML	numeric (0 to 9999)	Slip maintenance limit. Enter a number from 0 to 9999 to specify the maintenance limit for slip.
	SLIPOL	numeric (0 to 9999)	Slip out of service limit. Enter a number from 0 to 9999 to specify the out-of-service limit for slip.
	RATE	56k or 64k	Data rate. Enter 56K or 64K to specify the data rate used.
	CLOCK	EXTRNL or INTRNL	Clock. Enter EXTRNL to specify an external clock source. Enter INTRNL to specify an internal clock source.
	LSC	LINE or NEI	Loopback select code. Enter LINE if the loopback is applied at the line side. Enter NEI if the loopback is applied at the network element interface.

Datafill example for table CARRMTC

The following examples show sample datafill for table CARRMTC.

MAP display example for table CARRMTC

```
CSPMTYPE      TMPLTNM        RTSML     RTSOL
ATTR

------------------------------------------------------
PDTC          DEFAULT        255       255
D30 NT6X27AA A_LAW INTERNATL 30 30 4 20 30 30 4 20
30 30 4 20 30 30 4 20 60 60 4 20 4 20 Y 4 4 17 255
N N 5 5 205 914 G714 CCS
```

Channelized access on LPP/LIS (continued)

MAP display example for table CARRMTC

```
CSPMTYPE      TMPLTNM        RTSML     RTSOL
ATTR

------------------------------------------------------
DTC           DEFAULT        255       255
DS1 NT6X50AA MU_LAW SF ZCS BPV NILDL N 250 1000 50
50 150 1000 3 6 864 100 17 511 4 255
```

Datafilling table PMLOADS

The following table shows the datafill specific to Channelized access on LPP/LIS for table PMLOADS. Only those fields that apply directly to Channelized access on LPP/LIS are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table PMLOADS (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
LOADNAME		alphanumeric (1 to 32 characters)	Peripheral module load name. Enter a string to specify XPM load file name.
ACTFILE		alphanumeric (1 to 32 characters)	Active load file name. Enter a string to specify the active XPM load file name.
ACTVOL		alphanumeric (1 to 16 characters)	Active volume. Enter a string to specify the device where the active load file is stored.
BKPFILE		alphanumeric (1 to 32 characters)	Backup load filename. Enter a string to specify the backup XPM load file name. In BCS36 and up, this is the load file that NT shipped and it should be the same as the entry in field LOAD in the inventory tables.

Channelized access on LPP/LIS (continued)

Datafilling table PMLOADS (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
BKPVOL		alphanumeric (1 to 16 characters)	Backup volume. Enter a string to specify the device where the backup load file is stored.
UPDACT		Y or N	Update active loadfile. Enter Y if the entry in field ACTFILE should be updated automatically with the patched load file name.

Datafill example for table PMLOADS

The following example shows sample datafill for table PMLOADS.

MAP display example for table PMLOADS

```
LOADNAME      ACTFILE        ACTVOL     BKPFILE
BKPVOL        UPDACT

------------------------------------------------------
NRS36BF      NRS36BF        S01DIMAGE2  NRS36BF
S01DIMAGE2    N
```

Datafilling table LTCINV

The following table shows the datafill specific to Channelized access on LPP/LIS for table LTCINV. Only those fields that apply directly to

Channelized access on LPP/LIS (continued)

Channelized access on LPP/LIS are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table LTCINV (Sheet 1 of 4)

Field	Subfield or refinement	Entry	Explanation and action
LTCNAME		see subfields	Line trunk controller name. This field consists of subfields XPMTYPE and XPMNO.
	XPMTYPE	ADTC, BDTC, DFI, DTC, DTCI, GPP, IDTC, ILGC, ILTC, LGC, LTC, PDTC, PLGC, SMA, SMS, SMU, or TMS	68K peripheral module type. Enter the extended multiprocessor system peripheral module (PM) type.
	XPMNO	0 to 255	68K peripheral module number. Enter the PM number. ***Note:*** Operating company personnel can number the XPMs from 0 to 255 but the total number of tuples in tables LTCINV and LTCRINV combined cannot exceed 210 XPMs. The XPM types can be any combination of types accepted by the two tables.
EQPEC		2P_PEC 3P_PEC 6T02AA 6X02AA 6X02AC 6X02AD 6X02AE 6X02AF 6X02AG 6X02AH 6X02AQ 6X02BA 6X02BC 6X02BD 6X02BE 6X02BF 6X02BG	Equipment product engineering code. Enter the product engineering code (PEC) of the appropriate piece of equipment as described below. If the entry in field XPMTYPE is ADTC, enter 6102SA, 6102SE, or 6102UA. If the entry in field XPMTYPE is an ALGC_ADTC combination, enter 6102SG, 6102SI, or 6102UG. If the entry in field XPMTYPE is ALGC, enter 6102NA, 6102SB, 6102SF, or 6102UB. If the entry in field XPMTYPE is BDTC, enter 6X02BC. If the entry in field XPMTYPE is DFI, enter MX85AA.

Channelized access on LPP/LIS (continued)

Datafilling table LTCINV (Sheet 2 of 4)

Field	Subfield or refinement	Entry	Explanation and action
		6X02BK 6X02BS 6X02BT 6X02DG 6X02EB 6X02EE 6X02EL 6X02FA 6X02GA	If the entry in field XPMTYPE is DTC, enter 6X02AF, 6X02AQ, 6X02BS, 6X02BT, 6X02IA, 6X02IE, or 6X02IF.
		6X02HA 6X02IA 6X02IE 6X02IF 6X02JA 6X02KA	If the entry in field XPMTYPE is IDTC, enter 6X02BA, 6X02HA, or 6X02KA. For single card new message IDTC/Caribbean expansion program (IDTC/CEP), enter 6X02HA. For tone card 6X69KA for China, enter 6X02KA.
		6X02LA 6X02LD 6X02MA 6X02MD 6X02NA 6X02P2 6X02P3 6X02UA 6X02UC 6X02UI 6X0201 6X0211 6X0215 6102NA 6102SA 6102SB 6102SE 6102SF 6102SG 6102SI 6102UA 6102UB 6102UG 7X3304 FX3304 MX85AA	If the entry in field XPMTYPE is ILGC, enter 6X02BF, 6X02BK, 6X02FA, 6X02GA, 6X02KB, or 6X0211. For dual cards messaging ILGC for Turkey, enter 6X02BF. For single card messaging ILGC for Turkey, enter 6X02BK. For single card new message ILGC/CEP, enter 6X02FA or 6X02GA. If the entry in field XPMTYPE is LGC, enter FX33CB, NX33GC, 6X02AA, 6X02AC, 6X02AE, 6X02AH, 6X02LA, 6X02LD, 6X02NA, 6X0201, or 6X0215. For LGC using the North American RAM-based tone set, enter 6X02P2. If the entry in field FRTYPE is LTEI, enter 6X02NA.

Channelized access on LPP/LIS (continued)

Datafilling table LTCINV (Sheet 3 of 4)

Field	Subfield or refinement	Entry	Explanation and action
			If the entry in field XPMTYPE is LTC, enter 2P_PEC for a two-processor LTC, 3P_PEC for a three-processor LTC, 6X02AD, 6X02AG, 6X02MA, 6X02MD, or 7X3304. For LTC using the North American RAM-based tone set, enter 6X02P2. If the entry in field XPMTYPE is MTCM, enter FX3304. If the entry in field XPMTYPE is PDTC, enter 6X02BD, 6X03BE, or 6X02JA. For Turkish tones with R2 signaling, enter 6X02JA. For two-processor PDTC with frame type LTEI, enter 6X02UA. For PDTC with frame type LTEI, or for DTCO+, enter 6X02UC. If the entry in field XPMTYPE is PLGC, enter 6X02BG. For two-processor PLGC with frame type LTEI, enter 6X02UA. For PLGC with frame type LTEI, enter 6X02UC. If the entry in field XPMTYPE is PLTC or PDTC+, enter 6X02UC. If the entry in field XPMTYPE is P2LGC, enter 6X02UA. If the entry in field XPMTYPE is P3LGC, enter 6X02UI. If the entry in field XPMTYPE is SMA, enter 6X02AA. If the entry in field XPMTYPE is SMS, enter 6X02DG.

Channelized access on LPP/LIS (continued)

Datafilling table LTCINV (Sheet 4 of 4)

Field	Subfield or refinement	Entry	Explanation and action
			If the entry in field XPMTYPE is SMU, enter 6X02DG, 6X02EB, 6X02EE, or 6X02EL. If the entry in field XPMTYPE is TMS and the entry in field FRTYPE is LTEI, enter 6X02UA. This enables the TMS to use the PCM30. For a two-processor XPM equipped with NT6X69LA, enter 6X02P2.
CSLNKTAB		see subfields	C-side link table. The subfields for this field depend on whether switches are equipped with the junctored network (JNET) or the enhanced network (ENET). If the switch is equipped with JNET, datafill subfields NMPAIR and NMPORT, and field OPTCARD. Refer to table LTCINV in the data schema section of this document for more information. If the switch is equipped with ENET, datafill subfields ENSHELF, ENSLOT, ENLINK, and ENDS30 and field OPTCARD. Refer to table LTCINV in the data schema section of this document for more information.
OPTATTR		CCS7	Optional attribute. This field is a vector of up to nine optional attributes. If the DTC is used for CCS7 ISUP call processing and the value in field XPMTYPE is DTC, enter CCS7. Do not enter the CCS7 option for DTCs not associated with CCS7. The CCS7 attribute cannot be deleted from a DTC if ISUP trunks are datafilled and assigned to that PM. The ISUP trunks must be deleted before proceeding with the table LTCINV change.

Datafill example for table LTCINV

The following example shows sample datafill for table LTCINV.

Channelized access on LPP/LIS (continued)

MAP display example for table LTCINV

```
LTCNAME      ADNUM   FRTYPE     FRNO   SHPOS     FLOOR
ROW    FRPOS  EQPEC           LOAD      EXECTAB
CSLINKTAB
OPTCARD                        TONESET
PECS6X45             E2LOAD     OPTATTR        PEC6X40
-----------------------------------------------------
PDTC 0      1005    LTEI        0      18        1
B     3    6X02UA           UDT36BA    (ABTRK  DTCEX)$
(0 0 ) (0 8)  (0 16) (0 24) $
(RAM6X69) (NT6X28) $            JAPAN
6X45BA 6X45BA        NILLOAD   $              6X40AC

DTC  1      1001    DTE         5      54        3
B     5    6X02UA           DC702BW    (ABTRK  DTCEX)$
(1 0 ) (1 8)  (1 16) (1 24) $
(CONTINUITY) (MSG6X69) $           NORTHAM
6X45BA 6X45BA        NILLOAD   (CCS7) $       6X40AC
```

The following example shows sample datafill for table LTCINV in an ENET using DS512 fiber links.

MAP display example for table LTCINV in an ENET using DS512 fiber links

```
LTCNAME      ADNUM   FRTYPE     FRNO   SHPOS     FLOOR
ROW    FRPOS  EQPEC           LOAD      EXECTAB
CSLINKTAB
OPTCARD                        TONESET
PECS6X45             E2LOAD     OPTATTR        PEC6X40
-----------------------------------------------------
DTC  27     1013    DTE         9      51        0
DD    2    6X02AA           DC736CR1    (ABTRK  DTCEX)$
(0 12 2 0 ) (0 12 2 1) (0 12 2 2) (0 12 2 3)
(0 12 2 4) (0 12 2 5) (0 12 2 6) (0 12 2 7)
(0 12 2 8) (0 12 2 9) (0 12 2 10) (0 12 2 11)
(0 12 2 12) (0 12 2 13) (0 12 2 14) (0 12 2 15) $
(UTR15) (MSG6X69) $            NORTHAM
6X45BA 6X45BA        NILLOAD   (CCS7) $        6X40AC
```

The following example shows sample datafill for table LTCINV in an JNET using DS30 copper links.

Channelized access on LPP/LIS (continued)

MAP display example for table LTCINV in an JNET using DS30 copper links

```
LTCNAME      ADNUM   FRTYPE     FRNO   SHPOS     FLOOR
ROW    FRPOS  EQPEC           LOAD      EXECTAB
CSLINKTAB
OPTCARD                        TONESET
PECS6X45             E2LOAD    OPTATTR        PEC6X40
-------------------------------------------------------
DTC  0        1012    DTE         13      51        0
GG    2    6X02AA           DC736CR1    (ABTRK  DTCEX)$
(0 10 0 0) (0 16 1 0) (0 16 2 0)  (0 16 3 0)
(0 16 4 0) (0 16 5 0) (0 16 6 0)  (0 16 7 0)
(0 16 8 0) (0 16 9 0) (0 16 10 0)  (0 16 11 0)
(0 16 12 0) (0 16 13 0) (0 16 14 0)  (0 16 15 0) $
(CONTINUITY) (MSG6X69) $             NORTHAM
6X45BA 6X45BA        NILLOAD   (CCS7) $        6X40AC
```

The following example shows sample datafill for table LTCINV using XMX-based peripheral module product life upgrade strategy (XPM+).

MAP display example for table LTCINV using XPM+

```
LTCNAME   FRTYPE FRNO SHPOS  FLOOR  ROW FRPOS
EQPEC   LOAD         EXECTAB
CSLNKTAB        OPTCARD
TONESET         PECS6X45              E2LOAD
OPTATTR         PEC6X40               EXTINFO
-----------------------------------------------------------
DTC   0     MCTM    0    5      1    A   3
6X02P2  ED707BI    (     ABTRK  DTCEX)$
(0 10 0 0) (0 10 0 1) (0 10 0 2) (0 10 0 3) (0 10 0 4)
(0 10 0 5) (0 10 0 6) (0 10 0 7) (0 10 0 8) (0 10 0 9)
(0 10 0 10) (0 10 0 11) (0 10 0 12) (0 10 0 13) (0 10 0 14)
(0 10 0 15) $  (     UTR15 ) (     UTR17 ) (   RAM6X69 )$
JAPAN1          MX77AA MX77AA         MX77NI08
CCS7)$          6X40FA                N
```

Channelized access on LPP/LIS (continued)

Error messages for table LTCINV

The following example shows the error message that is generated if the field E2LOAD is incorrectly datafilled in table LTCINV.

Error messages for table LTCINV

Error message	Explanation and action
`INFO: E2LOAD has been datafilled with "NILLOAD"`	An info is generated if the shelf is not equipped with NTMX77AA and field E2LOAD is datafilled with a string other than NILLOAD.

Datafilling table LTCPSINV

The following table shows the datafill specific to Channelized access on LPP/LIS for table LTCPSINV. Only those fields that apply directly to Channelized access on LPP/LIS are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table LTCPSINV (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
LTCNAME		see subfields	Link trunk controller name. This field contains subfields XPMTYPE and XPMNO.
	XPMTYPE	alphanumeric	Peripheral module type. Enter the type of PM.
	XPMNO	numeric (0 to 255)	Peripheral module number. Enter a number from 0 to 255 to specify the PM number. ***Note:*** Operating company personnel can number the XPMs from 0 to 255 but the total number of tuples in tables LTCINV and LTCRINV combined cannot exceed 210 XPMs. The XPM types can be any combination of types accepted by the two tables.
PSLNKTAB		vector and see subfields	P-side link table. This field is a vector of up to 20 multiples of subfields PSLINK and PSDATA.Enter $ to signify the end of the vector.
	PSLINK	numeric (0 to 19)	P-side link. Enter the P-side port number.
	PSDATA	see subfields	P-side data. This field contains subfields AREASELCT, CARRIDX, and ACTION.

Channelized access on LPP/LIS (continued)

Datafilling table LTCPSINV (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	AREASELCT	D30 or DS1	Area select. Enter D30 for interface to a PDTC. Complete subfields CARRIDX and ACTION. See the appropriate subfields for definitions. Enter DS1 for interface to a DTC. Complete subfields CARRIDX and ACTION. See the appropriate subfields for definitions. NILTYPE is the default value and should not be datafilled for initial input. No further fields need be datafilled.
	CARRIDX	alphanumeric (1 to 16 characters) or DEFAULT	Carrier index. Enter DEFAULT for the default carrier name in table CARRMTC. Enter a valid template name. The template name must be datafilled in table CARRMTC.
	ACTION	Y or N	Action. Enter Y if the carrier should be removed from service when the out-of-service limit for frame, slip, errored-second, or severe-errored-second is exceeded. Otherwise, enter N.

Datafill example for table LTCPSINV

The following example shows sample datafill for table LTCPSINV.

MAP display example for table LTCPSINV

```
LTCNAME      PSLINKTAB
-----------------------------------------------------
PDTC  0      (O D30 DEFAULT N)  (1 D30 DEFAULT N)
(2 D30 DEFAULT N) (3 D30 DEFAULT N) (4 NILTYPE)
(5 NILTYPE) (6 NILTYPE) (7 NILTYPE) (8 NILTYPE)
(9 NILTYPE) (10 NILTYPE) (11 NILTYPE) (12 NILTYPE)
(13 NILTYPE) (14 NILTYPE) (15 NILTYPE) $

DTC  1        (0 DS1 DEFAULT N) (1 DS1 DEFAULT N)
(2 DS1 DEFAULT N) (3 DS1 DEFAULT N)
(4 DS1 DEFAULT N) (5 DS1 DEFAULT N) (6 NILTYPE)
(7 NILTYPE) (8 NILTYPE) (9 NILTYPE) (10 NILTYPE)
(11 NILTYPE) (12 NILTYPE) (13 NILTYPE) (14 NILTYPE)
(15 NILTYPE) (16 NILTYPE) (17 NILTYPE) (18 NILTYPE)
(19 NILTYPE)   $
```

Channelized access on LPP/LIS (continued)

Datafilling table TRKGRP

The following table shows the datafill specific to Channelized access on LPP/LIS for table TRKGRP. Only those fields that apply directly to Channelized access on LPP/LIS are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table TRKGRP

Field	Subfield or refinement	Entry	Explanation and action
GRPKEY		see subfield	Group key. This field contains the subfield CLLI.
	CLLI	numeric	Common language location identifier. Enter the alphanumeric code that indicates the trunk group specified in table CLLI.
GRPINFO		see subfield	Variable group data. This field contains subfield GRPTYP and its refinements.
	GRPTYP	see subfields	Group type. Enter IT for an intertoll incoming or outgoing end office. Complete subfields TRAFSNO, PADGRP, NCCLS, DIRDATA, TRAFCLS, SELSEQ, CONNGNPA, PRTNM, SCRNCL, SNPA, TERMTC, TOLLCOMP, CCWKVLD, and OPTIONS. Enter TI for an incoming end office. Complete subfields TRAFSNO, PADGRP, NCCLS, TRAFCLS, PRTNM, SCRNCL, SNPA, ORIGSCRE, VDEVAR, and OPTIONS. Enter TO for an outgoing end office. Complete subfields TRAFSNO, PADGRP, NCCLS, TRAFCLS, SELSEQ, DIGSOUT, TOLL, and OPTIONS. Enter T2 for a two-way end office. Complete subfields TRAFSNO, PADGRP, NCCLS, TRAFCLS, SELSEQ, DIGSOUT, TOLL, PRTNM, SCRNCL, SNPA, ORIGSRCE, VDEVAR, and OPTIONS.
	DIRDATA	see subfield	Direction data. This field contains subfield DIR.
	DIR	IC or OG	Direction. Enter IC for incoming traffic. Enter OG for outgoing traffic.

Channelized access on LPP/LIS (continued)

Datafill example for table TRKGRP

The following example shows sample datafill for table TRKGRP.

MAP display example for table TRKGRP

```
GRPKEY
GRPINFO
-----------------------------------------------------
CA_TRK
TI   0   NPDGP  NCRT
```

Datafilling table TRKSGRP

The following table shows the datafill specific to Channelized access on LPP/LIS for table TRKSGRP. Only those fields that apply directly to Channelized access on LPP/LIS are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table TRKSGRP (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
SGRPKEY		see subfields	Subgroup key. This field contains subfields CLLI and SGRP. See the appropriate subfields for definitions.
	CLLI	numeric	Common language location identifier. Enter the code assigned to the CLLI table in field TRKGRP to which the subgroup belongs.
	SGRP	0 or 1	Subgroup number. Enter 0 or 1 to specify the trunk subgroup number.
CARDCODE		DS1SIG	Card code. Enter DS1SIG.
SGRPVAR		see subfield	Variable subgroup data. This field contains subfield SIGDATA and its refinements.
	SIGDATA	C7UP and see subfield	Signaling data. Enter C7UP. Complete subfield DIR.

Channelized access on LPP/LIS (continued)

Datafilling table TRKSGRP (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	DIR	IC, OG, or 2W	Trunk direction. Enter IC for incoming trunks. Complete subfields ESUPR, SAT, ECSELECT, ABCNTL, PROTOCOL, TMRNAME, and OPTIONS. Enter OG for outgoing trunks. Complete subfields ESUPR, SAT, ECSELECT, ABCNTL, PROTOCOL, TMRNAME, and OPTIONS. Enter 2W for two-way trunks. Complete subfields ESUPR, SAT, ECSELECT, ABCNTL, PROTOCOL, TMRNAME, GLAREVAR and OPTIONS.
	ESUPR	H, N, or F	Echo suppressor. If the trunk group has echo suppressors, do the following: • Enter H (half) if a half-echo suppressor is located at the near end of the trunk group. • Enter N (no) if the trunk group has no echo suppressors located at the near end of the trunk group. • Enter F (full) if a full-echo suppressor is located at the near end of the trunk group. If the entry is F, the switch takes no action and is used for administrative purposes only. Entering F has the same effect as entering N.
	ADJNODE	alphanumeric	Adjacent node. Enter a string of up to 12 alphanumeric characters to specify the name of the adjacent node previously datafilled as the key in table ADJNODE.
	TMRNAME	alphanumeric or NIL	Timer name. Enter the timer name previously datafilled in table C7UPTMR. Enter NIL if the call processing and trunk maintenance datafill timers are hard-coded.

Datafill example for table TRKSGRP

The following example shows sample datafill for table TRKSGRP.

MAP display example for table TRKSGRP

```
SGRPKEY
CARDCODE        SGRPVAR
-------------------------------------------------------
CA_TRK 0
DS1SIG          C7UP  UNEQ $
```

Datafilling table TRKMEM

The following table shows the datafill specific to Channelized access on LPP/LIS for table TRKMEM. Only those fields that apply directly to Channelized access on LPP/LIS are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table TRKMEM (Sheet 1 of 6)

Field	Subfield or refinement	Entry	Explanation and action
CLLI		alphanumeric (1 to 16 characters)	Common language location identifier. Enter the common language location identifier (CLLI) code that is assigned to the trunk group to which the trunk is a member. This CLLI code is assigned in table CLLI.
EXTRKNM		numeric (0 to 9999)	External trunk number. Enter the external trunk number that is assigned to the trunk. For members of trunk groups using the AIOD option, the external trunk number must be unique over all trunks and lines using the same AIOD group.
SGRP		numeric (0 to 1)	Subgroup number. Enter the subgroup number to which the trunk is assigned.
MEMVAR		see subfield	Variable data for members. This field consists of subfield PMTYPE and refinements. Refer to table TRKMEM in the data schema section of this document for information on these refinements.

Channelized access on LPP/LIS (continued)

Datafilling table TRKMEM (Sheet 2 of 6)

Field	Subfield or refinement	Entry	Explanation and action
	PMTYPE	ADTC, ALGC, ARCC, ATM DCA, DCM, DTC, DTCI, HSI, HSIE, IAC, ICP, IDT, IDTC, ILTC, ISM, LGC, LTC, MMA, MTM, OAU, PDTC, PLGC, PRCC, PTM, RCC, RCC2, RCCI, RCO2, RMM, RMSC, RSM, SMA, SMU, SRCC, STM, TAN, T8A, TM2	Peripheral module type. Enter the peripheral module (PM) type on which the trunk is mounted and datafill the refinements associated with this entry value. Each refinement entry must be separated from the next by a blank space. If the CLLI code is for a trunk group of type TPS101, it must be assigned to a maintenance trunk module (MTM) or packaged trunk module (PTM) PM. If the value of field PMTYPE is ADTC, ALGC, ARCC, DCA, IDTC, ILTC, PDTC, PLGC, or PRCC, datafill subfields DEQNO, DEQCKTNO, and DEQCKTTS. If the value of field PMTYPE is ATM, ISM, MMA, MTM, OAU, PTM, RMM, RSM, STM, TAN, T8A, TM2, TM4, TM8, or TMA, datafill subfields TMNO and TMCKTNO. If the value of field PMTYPE is DCM, datafill subfields DCMNO, DCMCKTNO, and DCMCKTTS. If the value of field PMTYPE is DTC, datafill subfields DTCNO, DTCCKTNO, and DTCCKTTS. If the value of field PMTYPE is DTCI, datafill subfields DTCINO, DTCICKTNO, and DTCICKTTS. If the value of field PMTYPE is HSI or HSIE, datafill subfields HSINO, HSICKTNO, and HSICKTTS.

Channelized access on LPP/LIS (continued)

Datafilling table TRKMEM (Sheet 3 of 6)

Field	Subfield or refinement	Entry	Explanation and action
		TM4, TM8, TMA or TMS	If the value of field PMTYPE is IAC, datafill subfields IACNO, IACCKTNO, and IACCKTTS. If the value of field PMTYPE is ICP, datafill subfields ICPNO, ICPCKTNO, and ICPCKTTS. If the value of field PMTYPE is IDT, datafill subfields IDTNO and SHELFSLT. If the value of field PMTYPE is LGC, datafill subfields LGCNO, LGCCKTNO, and LGCCKTTS. If the value of field PMTYPE is LTC, datafill subfields LTCNO, LTCCKTNO, and LTCCKTTS. If the value of field PMTYPE is RCC, datafill subfields RCCNO, RCCCKTNO, and RCCCKTTS. If the value of field PMTYPE is RCC2, datafill subfields RCC2NO, RCC2CKTNO, and RCC2CKTTS. If the value of field PMTYPE is RCCI, datafill subfields RCCINO, RCCICKTNO, and RCCICKTTS.

Channelized access on LPP/LIS (continued)

Datafilling table TRKMEM (Sheet 4 of 6)

Field	Subfield or refinement	Entry	Explanation and action
			If the value of field PMTYPE is RCO2, datafill subfields RCO2NO, RCO2CKTNO, and RCO2CKTTS. If the value of field PMTYPE is RMSC, datafill subfields RMSCNO, RMCCKTNO, and RMCCKTTS. If the value of field PMTYPE is SMA, datafill subfields SMANO, SMACKTNO, and SMACKTTS. If the value of field PMTYPE is SMU, datafill subfields SMUNO, SMUCKTNO, and SMUCKTTS. If the value of field PMTYPE is SRCC, datafill subfields SRCCNO, SRCCCKTNO, and SRCCCKTTS. If the value of field PMTYPE is TMS, datafill subfields TMSNO, TMSCKTNO, and TMSCKTTS. ***Note:*** PRA type trunks can be datafilled on an ISDN Austrian digital trunk controller (ADTC). These trunks can be datafilled on ports 1 to 31. All members must have an interface identifier specified in table LTCPSINV before they can be added. An ISDN capable ADTC shelf differs from the standard ADTC because it has an ISP card NTBX01AA and a universal time switch NT6144EA card present. The shelf PEC is 6102NA, the frame type is LTEI.

Channelized access on LPP/LIS (continued)

Datafilling table TRKMEM (Sheet 5 of 6)

Field	Subfield or refinement	Entry	Explanation and action
			For offices with PTMs, datafill the value MTM. PTMs are manufacturer discontinued. If the peripheral module is PDTC, digital jack trunks can be datafilled if optional package NTXK50AA (TTP-digital jack ended trunks) is in the load. Digital jack trunks can only be datafilled on time-slot 1. The PDTC must be datafilled in table LTCINV and the specified circuit must be datafilled as a DS-0 link in table LTCPSINV. If the peripheral module is PDTC, PRA type trunks can be datafilled on ports 0 through 15 and on circuits 1 through 31. Time-slot 16 can be datafilled for IDTCs with carriers of signaling type CCS. If an attempt is made to datafill time-slot 16 with carriers of type CAS or DPNSS, an error message is output. For NFA trunk member, the type of peripheral module (PM) is restricted to either DTC or LTC. These PMs must be equipped with universal tone receiver (UTR). The RCO2 is a remote unit part of the CPM (Common Peripheral Module) family, used in the DMS-100 family for international applications. It is the international version of the RCC2. The RCO2 has the same architecture as the RCC2 and is based on two shelves (introduced for the Domestic RCC2 program in BCS33).

Channelized access on LPP/LIS (continued)

Datafilling table TRKMEM (Sheet 6 of 6)

Field	Subfield or refinement	Entry	Explanation and action
			RCO2 supports up to 16 PCM30 on the C-side (mapping towards the LGCO) and up to 46 PCM30 on the P-side including 24 PCM30 on the extension shelf. RCO2 supports several types of lines, trunks, and certain small remotes on its P-side, as listed below: • line concentrating module (LCM) • extended line concentrating module (LCME) • community dial office (CDO) trunks • PBX trunks • remote unit RCO2 supports up to 16 PCM30s on the C-side (mapping towards the LGCO) and up to 46 PCM30s on the P-side, including 24 PCM30s on the extension shelf.

Datafill example for table TRKMEM

The following example shows sample datafill for table TRKMEM.

MAP display example for table TRKMEM

```
CLLI        EXTRKNM        SGRP      MEMVAR
-------------------------------------------------------
CA_TRK      0              0         DTC   1  1  1
```

Datafilling table LIMINV

The following table shows the datafill specific to Channelized access on LPP/LIS for table LIMINV. Only those fields that apply directly to

Channelized access on LPP/LIS (continued)

Channelized access on LPP/LIS are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table LIMINV

Field	Subfield or refinement	Entry	Explanation and action
LIM		numeric (0 to 16)	Link interface module number. Enter the number assigned to the LIM.
FLOOR		numeric (0 to 99)	Floor. Enter a number to specify the floor on which the LIM is located.
ROW		alphanumeric A to Z,AA to ZZ, excluding I, O, II, and OO	Row. Enter one or two alphabetic characters to specify the row in which the cabinet is located.
POSITION		numeric (0 to 99)	Frame position. Enter the number to specify the bay position of the LIM.
CABTYPE		LIM	Cabinet type. Enter LIM.
CABNUM		numeric (0 to 511)	Cabinet number. Enter the number assigned to the cabinet.
LOAD		alphanumeric (1 to 8 characters)	Software load name. Enter the current software load name in the LIM, as datafilled in table PMLOADS.
CABPEC		NT9X70AA or NT9X70BA	Cabinet PEC. Enter the cabinet PEC.
SHLF0PEC		NT9X71AA or NT9X71AB	PEC for shelf 0. Enter the PEC for the local MS shelf—the top shelf in the cabinet.
MTCEVRSN		0.0, 1.0, or 2.0	Maintenance version. Enter the maintenance version of the LIM. Enter the value surrounded by single quotes. For example, '1.0'.

Datafill example for table LIMINV

The following example shows sample datafill for table LIMINV.

Channelized access on LPP/LIS (continued)

MAP display example for table LIMINV

```
LIM     FLOOR    ROW    POSITION   CABTYPE   CABNUM
LOAD             CABPEC          SHLF0PEC     MTCEVRSN
-------------------------------------------------------
2        1        A      0          LIM      500
LPX36BH          NT9X70AA       NT9X71AA       1.0
```

Datafilling table SUSHELF

The following table shows the datafill specific to Channelized access on LPP/LIS for table SUSHELF. Only those fields that apply directly to Channelized access on LPP/LIS are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table SUSHELF (Sheet 1 of 3)

Field	Subfield or refinement	Entry	Explanation and action
SHELFKEY		see subfields	Shelf key. This field contains subfields CONTROL, CTRLNUM, CARDNUM, PORTNUM, and LIUSHELF.
	CONTROL	LIM or MS	Control. Enter LIM or MS.
	CTRLNUM	NIL or numeric (0 to 16)	Control number. Enter a number to specify the LIM. Enter NIL for MS.
	CARDNUM	numeric (5 to 23)	Interface card number. Enter a number to specify the interface card on the MS or LIM.
	PORTNUM	numeric (0 to 3)	Port number. Enter a number to specify the port on the interface card.
	LIUSHELF	numeric (0 to 3)	Link interface unit shelf. Enter the number of the shelf within the cabinet.
FLOOR		numeric (0 to 99)	Floor. Enter a number to specify the floor on which the cabinet is located.

Channelized access on LPP/LIS (continued)

Datafilling table SUSHELF (Sheet 2 of 3)

Field	Subfield or refinement	Entry	Explanation and action
ROW		alphanumeric A to Z,AA to ZZ, excluding I, O, II, and OO	Row. Enter one or two alphabetic characters to specify the row in which the cabinet is located.
FRAMEPOS		numeric (0 to 99)	Frame postion. Enter a number to specify the position of the LIS cabinet in the row.
FRAMETYP		LIM, EMC, or SCC	Frame type. Enter LIM, EMC, or SCC to specify the type of cabinet.
FRAMENUM		numeric (0 to 511)	Frame number. Enter a number to specify the cabinet.
SHELFPOS		numeric (0 to 77)	Shelf position. Enter a number to specify the base mounting position.
SHELFPEC		alphanumeric	Shelf PEC. Enter the PEC of the LIU shelf.
CARDINFO		see subfields	Card information. This field contains two vectors of up to two multiples of subfields SLOT, FRONTPEC, and BACKPEC. TFI and LIS F-bus controller (LFC) card PECs cannot be mixed.
	SLOT	7, 8, 30, 31, 32	Slot number. Enter the slot number of the card on the LIS as follows: • slot 7 for the required F-bus 0 card • slot 32 for the required F-bus 1 card • slot 31 for optional F-bus 0 termination on an NT9X72AA shelf • slot 8 for optional F-bus 1 termination on an NT9X72AA shelf • slot 30 for an SSLPP

Channelized access on LPP/LIS (continued)

Datafilling table SUSHELF (Sheet 3 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	FRONTPEC	alphanumeric	Front card PEC. Enter the PEC of the front card as follows: • NT9X74AA/BA/CA—F-bus repeater card for TFI-supported LIS only • NT9X74DA—F-bus repeater card for channelized access • NT9X96AA—LFC card for SR512-supported LIS only • NIL—for optional termination datafill only, no front card
	BACKPEC	alphanumeric	Back card PEC. Enter the PEC of the back card as follows: • NT9X79AA/BA—F-bus extension paddle board • NT9X98AA—SSLPP interface paddle board • NTEX20AA/BA—optional DS512 interface paddle board. NTEX20AA terminates F-bus 0; NTEX20BA terminates F-bus 1.

Datafill example for table SUSHELF

The following example shows sample datafill for table SUSHELF.

MAP display example for table SUSHELF

```
SHELFKEY     FLOOR    ROW   FRAMEPOS      FRAMETYP
FRAMENUM   SHELFPOS   SHELFPEC
CARDINFO
------------------------------------------------------
LIM 2 12 0 1 1         A     0             LIM
0        26       NT9X72AA
(7 NT9X74DA NT9X79AA)$       (32 NT9X74DA NT9X79AA)$
```

Datafilling table NETWORK

The following table shows the datafill specific to Channelized access on LPP/LIS for table NETWORK. Only those fields that apply directly to

Channelized access on LPP/LIS (continued)

Channelized access on LPP/LIS are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table NETWORK (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
NETNUM		see subfields	Network number. This field contains subfields PAIR and PLANE.
	PAIR	numeric (0 to 31)	Network pair. Enter a number from 0 to 31 to specify the network pair.
	PLANE	0 or 1	Plane number. Enter 0 or 1 to specify the plane number of the network pair.
SHPOS		numeric (0 to 77)	Shelf position. Enter a number from 0 to 77 to specify the base mounting position of the network module.
FLOOR		numeric (0 to 99)	Floor. Enter a number from 0 to 99 to specify the floor or the remote location on which the network module (NM) is located.
ROW		A to Z, or AA to ZZ, except I, O, II, and OO	Row. Enter one or two alphabetic characters from A to Z, or AA to ZZ, excluding I, O, II, and OO, to specify the row in which the trunk module equipment frame is located.
FRPOS		numeric (0 to 99)	Frame position. Enter a number from 0 to 99 to specify the bay position in the row where the NM is located.
MSCARD		numeric (6 to 23)	Message switch controller card. Enter a number from 0 to 31 to specify the number of the MS controller card assigned to the I/O controller (IOC).
MSPORT		numeric (0 to 15)	Message switch controller port. Enter a number from 0 to 15 to specify the number of the MS controller port which is assigned to the IOC.

Channelized access on LPP/LIS (continued)

Datafilling table NETWORK (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
NETSIZE		FSIZE, HSIZE, or QSIZE	Network size. Enter one of the following to specify the network size: • FSIZE for full • HSIZE for half • QSIZE for quarter
EQPEC		0X48AA 5X13AA 5X13AB 5X13BA 5X13LS 7X27AA 7X27AB 8X11AA 8X11BA or 8X1101	Equipment product engineering code. Enter the product engineering code of the network. Enter 0X48AA if the PEC is 0X48AB, AC, AG, AH, or AJ. Enter 5X13AA or 5X13BA for the 5X13 network. Enter 5X13LS for the large system configuration (LSC) network simulator. Enter 7X27AA for the 7X27 network. Enter 5X13AB or 7X27AB for the 5X13 or 7X27 networks with per-channel digital gain pads on their A-side crosspoint cards. Enter 8X11AA or 8X11BA for the double shelf network equipment (DSNE). Enter 8X1101 for the cabinetized Meridian SL-100 network.

Datafill example for table NETWORK

The following example shows sample datafill for table NETWORK.

MAP display example for table NETWORK

```
NETNUM     SHPOS   FLOOR   ROW   FRPOS     MSCARD
MSPORT     NETSIZE         EQPEC
-------------------------------------------------------
0  0       51      1       B     1         22
1         FSIZE           8X11AA
```

Datafilling table NIUINV

The following table shows the datafill specific to Channelized access on LPP/LIS for table NIUINV. Only those fields that apply directly to

Channelized access on LPP/LIS (continued)

Channelized access on LPP/LIS are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table NIUINV (Sheet 1 of 3)

Field	Subfield or refinement	Entry	Explanation and action
NUMBER		numeric (0 to 29)	Number. Enter a number from 0 to 29 to specify the number of the NIU.
LOCATION		see explanation	NIU location. This field is a multiple of CTRL and SHELF.
	CTRL	LIM or MSand see subfield(s)	Control. Enter either LIM or MS. If the control is a LIM, complete subfield LIMNUM. If the control is an MS, complete subfields MSCARD and MSPORT.
	LIMNUM	numeric (0 to 16)	LIM number. Enter a number from 0 to 16 to specify the LIM.
	MSCARD	numeric (5 to 23)	Message switch card. Enter a number from 5 to 23 to specify the MS card.
	MSPORT	numeric (0 to 3)	Message switch port. Enter a number from 0 to 3 to specify the MS port.
	SHELF	numeric (1 to 3)	Shelf. The shelf portion depends on the host. If the control is a LIM, then the shelf can have a value from 1 to 3. If the control is the MS, then the shelf must have the value 1.
LOAD		alphanumeric (1 to 8 characters)	Load. Enter a string of 1 to 8 alphanumeric characters to define the name of the default load file, as datafilled in table PMLOADS.
U0INFO		see subfields	Unit 0 information. This field contains subfields PROCPEC, CBCPEC, and PBPEC. See the appropriate subfields for definitions.
	PROCPEC	NTEX22BB	Integrated processor and F-bus interface PEC code. Enter NTEX22BB, the PEC code for the processor.
	CBCPEC	NTEX25AA	Channel bus controller PEC. Enter NTEX25AA, the PEC for the CBC.

Channelized access on LPP/LIS (continued)

Datafilling table NIUINV (Sheet 2 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	PBPEC	NTEX28AA	DS30 paddle board PEC. Enter NTEX28AA, the PEC for the netlink paddle board.
U1INFO		see subfields	Unit 1 information PEC code. This field contains subfields PROPEC, CBCPEC, and PBPEC. See the appropriate subfields for definitions.
	PROCPEC	NTEX22BB	Integrated processor and F-bus interface PEC. Enter NTEX22BB.
	CBCPEC	NTEX25BA	Channel bus controller PEC. Enter NTEX25BA.
	PBPEC	NTEX28AA	DS30 paddle board PEC. Enter NTEX28AA.
NETLINKS		vector	Network links. This field contains the network links which the NIU will use to connect to the network. This field is a vector of up to four multiples. For JNET, this field contains subfields NMPAIR and NMPORT for each DS30 link to the network. For ENET, this field contains subfields ENSHELF, ENSLOT, ENLINK, and ENDS30. See the appropriate subfields for definitions. Enter $ to signify the end of the vector.
	NMPAIR	numeric (0 to 31)	Network module pair number. Enter the number from 0 to 31 to specify the network link on which the PM is assigned, corresponding to C-side links 0 to 15 of the PM.
	NMPORT	numeric (0 to 63)	Network port. Enter the number from 0 to 63 to specify the network port that corresponds to the network link.
	ENSHELF	numeric (0 to 7)	ENET pair number. Enter a number from 0 to 7 to specify the network pair on which the PM is assigned, corresponding to C-side links 0 to 15 of the PM.
	ENSLOT	numeric (10 to 16, or 25 to 32)	ENET slot number. Enter a number from 10 to 16 or 25 to 32 to specify the ENET slot on which the PM is assigned, corresponding to the PM C-side links.

Channelized access on LPP/LIS (continued)

Datafilling table NIUINV (Sheet 3 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	ENLINK	numeric (0 to 18)	ENET link number. Enter a number from 0 to 18 to specify the link on the paddle board on which the PM is assigned, corresponding to the PM C-side links.
	ENDS30	0	ENET DS30 link number. For DS30 links, enter 0.

Datafill example for table NIUINV

The following example shows sample datafill for table NIUINV in a JNET.

MAP display example for table NIUINV in a JNET

```
NUMBER      LOCATION     LOAD     U0INFO
                         U1INFO
NETLINKS
------------------------------------------------------------
1           LIM 2 1      NRS36BF  NTEX22BB
NTEX25AA NTEX28AA        NTEX22BB NTEX25BA NTEX28AA
(1 3) (1 9) (1 17) (1 27) $
```

The following example shows sample datafill for table NIUINV in a ENET using DS30 copper links.

MAP display example for table NIUINV in an ENET using DS30 copper links

```
NUMBER      LOCATION     LOAD     U0INFO
                         U1INFO
NETLINKS
------------------------------------------------------------
3           LIM 3 3      NRS36Bs  NTEX22BB
NTEX25AA NTEX28AA        NTEX22BB NTEX25BA NTEX28AA
(0 13 0 0) (0 13 1 0) (0 13 2 0) (0 13 3 0) $
```

Datafilling table LIUINV

The following table shows the datafill specific to Channelized access on LPP/LIS for table LIUINV. Only those fields that apply directly to

Channelized access on LPP/LIS (continued)

Channelized access on LPP/LIS are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table LIUINV (Sheet 1 of 3)

Field	Subfield or refinement	Entry	Explanation and action
LIUNAME		see subfields	Link interface unit name. This key field contains subfields LIUTYPE and LIUNO.
	LIUTYPE	LIU7	Link interface unit type. Enter LIU7.
	LIUNO	numeric (0 to 511)	Link interface unit number. Enter the number assigned to the LIU7.
LOCATION		see subfields	Location. This field specifies the location of the LIU7 in the LIM. It contains subfields CTRL, SHELFNUM, and LIUSLOT.
	CTRL	MS or LIM and see subfields	Controlling host entity. If the host is a message switch, enter MS and complete subfields MSCARD, MSPORT, SHELFNUM, and LIUSLOT. If the controlling host is a LIM, enter LIM and complete subfields LIMNUM, SHELFNUM, and LIUSLOT.
	MSCARD	numeric (5 to 23)	Message switch card. Enter a number to specify the interface card: • For an SSLPP connected to a SuperNode SE cabinet, enter a number from 5 to 10. • For an SSLPP connected to a SuperNode cabinet, enter a number from 6 to 23. • For a TFI supported LIS, enter 12.
	MSPORT	numeric (0 to 3)	Message switch port. Enter a number to specify the message switch port.
	LIMNUM	numeric (0 to 16)	Link interface module number. Enter the number of the host LIM that the LIU7 resides on.
	SHELFNUM	1 or 2	Shelf number. Enter the shelf number. • For an LIU7 on an ENET shelf, enter 1. • For an LIU7 on the LIS, enter 2. • For an SSLPP, enter 1.

Channelized access on LPP/LIS (continued)

Datafilling table LIUINV (Sheet 2 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	LIUSLOT	numeric (8 to 31)	Link interface unit slot. Enter the slot number on the host LIM shelf where the LIU7 resides.
LOAD		numeric (1 to 8)	Software load name. Enter the software load name as datafilled in table PMLOADS.
PROCINFO		see subfields	Process information. This field specifies the PEC of the processors used in the LIU7. It contains subfield PROCPEC.
	PROCPEC	NTEX22BA or NTEX22BB	Process PEC. Enter the PEC of the processor card used in the LIU7.
CARDINFO		see subfields	Card information. This field specifies card data. It contains subfields APPLPEC and PBINFO.
	APPLPEC	alphanumeric	Application PEC. Enter the PEC of the signaling terminal card. • If the PEC is NT9X76AA or NT9X76BA, complete subfield PBINFO and its refinements.
	PBINFO	see subfield	Paddle board information. This field contains subfield PBPEC.
	PBPEC	NT9X77AA, NT9X78AA, NT9X78BA, NT9X78CA, NT9X78DA, NT9X85AA, NT9X85BA, or NTEX26AA and see subfields	Paddle board PEC. Enter the paddle board PEC. If the entry for subfield APPLPEC is NT9X76AA or NT9X76CA, enter NT9X77AA and complete subfields CLKRATE and CLKCONFG. If the entry for subfield APPLPEC is NT9X76AA or NT9X76CA, enter NT9X78AA, NT9X78BA, NT9X78CA, or NT9X78DA and complete subfields CLKSRCE, CLKRATE, and DS0TYP. For channelized access, enter NTEX26AA and complete subfields OPTIONS, CLKRATE, and PB_BIT_INV. If the entry for subfield APPLPEC is NT9X84AA, enter NT9X85AA or NT9X85BA and complete subfields HEARTBEAT and MAC_ADDRESS.
	OPTIONS	$	Option. Enter $.

Channelized access on LPP/LIS (continued)

Datafilling table LIUINV (Sheet 3 of 3)

Field	Subfield or refinement	Entry	Explanation and action
	CLKSRCE	FBUS or EXERNAL	Clock source. Enter the clock source for the paddle board.
	CLKRATE	48 000, 56 000, or 64 000	Clock rate. Enter the LIU7 paddle board clock rate (48 000, 56 000, or 64 000). The default is 56 000.
	CLKCONFG	DCE or DTE	Enter DCE or DTE to specify the clock configuration for the paddle board.
	DS0TYP	NIL or DS0TRK and see subfield	DS-0 type. Enter NIL if no DS-0 type is required. Otherwise, enter DS0TRK and complete subfield DS0TRK. DS0TRK is valid if channelized access is used.
	DS0TRK	see subfields	DS-0 trunk. This field consists of subfields CLLI and EXTRKNM.
	CLLI	alphanumeric	Common language location identifier. Enter the CLLI.
	PB_BIT_INV	NBI, EBI, OBI, or ABI	Paddle board bit inversion (BI) mode. The BI mode is a characteristic of the network through which the link facilities are connected. The mode selected must match the BI mode characteristic of the associated network. • For no bit inversion, enter NBI. The paddle board transmits and receives data without any bit manipulation. • For even bit inversion, enter EBI. The paddle board inverts the polarity of all even bits in the frame upon transmission. • For odd bit inversion, enter OBI. The paddle board inverts the polarity of all odd bits in the frame upon transmission. • For all bit inversion, enter ABI. The paddle board inverts the polarity of every bit in the frame upon transmission.

Datafill example for table LIUINV

The following example shows sample datafill for table LIUINV.

Channelized access on LPP/LIS (continued)

MAP display example for table LIUINV

```
LIUNAME     LOCATION     LOAD       PROCINFO
CARDINFO
------------------------------------------------------------
LIU7  201   LIM 2 1 8    LPX36BF    NTEX22BB
NT9X76AA NTEX26AA  $ 5600  ABI
```

Datafilling table C7NETWRK

The following table shows the datafill specific to Channelized access on LPP/LIS for table C7NETWRK. Only those fields that apply directly to Channelized access on LPP/LIS are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table C7NETWRK (Sheet 1 of 6)

Field	Subfield or refinement	Entry	Explanation and action
NETNAME		alphanumeric (1 to 16 characters)	Network name. Enter a string to specify the network name.
NODE TYPE		SSP, STP, or SSP_STP	Node type. This field specifies the node functionality for the tuple entry.
PTCODE		see subfield	Office point code. This field contains subfield NETTYPE and its refinements.
	NETTYPE	JPN7, ANSI7, NTC7, CCITT7, or TTC7and subfields	Network type. Enter ANSI7, CCITT7, JPN7, NTC7, or TTC7. If the network type is Japan Public Network, enter JPN7 and complete subfields MAINAREA, SUBAREA, and AREAUNIT.

Channelized access on LPP/LIS (continued)

Datafilling table C7NETWRK (Sheet 2 of 6)

Field	Subfield or refinement	Entry	Explanation and action
			If the network type is North American, enter ANSI7 and complete subfields NETWORK, CLUSTER, and MEMBER. If the network type is international, enter CCITT7 and complete subfield FORMAT. If the network type is TTC7, enter TTC7 and complete subfields MAINAREA, SUBAREA, and AREAUNIT. If the network type is NTC7, enter NTC7 and complete subfields NMAINAREA, NSUBAREA, and NSIGPOINT. The three subfields to be datafilled make up the origination PC (OPC), which must be unique in the network.
	MAINAREA	numeric (0 to 31)	Main area. If the entry in subfield NETTYPE is TTC7 or JPN7, enter a number from 0 to 31 to specify the main area assigned to this office. This entry is the first part of the OPC.
	SUBAREA	numeric (0 to 15)	Subarea. If the entry in subfield NETTYPE is TTC7 or JPN7, enter a number from 0 to 15 to specify the subarea in the main area assigned to this office. This entry is the second part of the OPC.
	NMAINAREA	numeric (0 to 255)	NTC7 main area. If the entry in subfield NETTYPE is NTC7, enter a number from 0 to 255. Enter the number to specify the main area assigned to this office. This entry is the first part of the OPC.
	NSUBAREA	numeric (0 to 255)	NTC7 sub area. If the entry in subfield NETTYPE is NTC7, enter a number from 0 to 255. Enter a number to specify the subarea in the main area assigned to this office. This entry is the second part of the OPC.
	NSIGPOINT	numeric (0 to 255)	NTC7 signal point. If the entry in subfield NETTYPE is NTC7, enter the number of the signal point assigned to the destination office.

Channelized access on LPP/LIS (continued)

Datafilling table C7NETWRK (Sheet 3 of 6)

Field	Subfield or refinement	Entry	Explanation and action
	AREAUNIT	numeric (0 to 127)	Area unit. If the entry in subfield NETTYPE is TTC7 or JPN7, enter a number to specify the area unit in the subarea assigned to this office. This entry is the third part of the OPC.
	NETWORK	numeric (0 to 255)	Network identifier. Enter the network identifier you have assigned to this office.
	CLUSTER	numeric (0 to 255)	Cluster. Enter the cluster number you have assigned to this office.
	MEMBER	numeric (0 to 255)	Member. Enter the member number within the cluster that you have assigned to this office.
	FORMAT	BASIC, INTL, AUSTRIA, CHINA, or GERMAN andsee subfields	CCITT format. If the entry in subfield NETTYPE is CCITT7, enter BASIC, INTL, AUSTRIA, or CHINA according to the following guidelines: • If the PC used is basic international, enter BASIC and complete subfield PC. • If the PC used is international, enter INTL and complete subfields ZONE, AREANETW, and SIGPOINT. • If the PC used is for Austria, enter AUSTRIA and complete subfields ZONE, REGION, and SIGPOINT. • If the PC used is for China, enter CHINA and complete subfields ZONE, EXCHANGE, and SIGPOINT. • If the PC in use is for Germany, enter GERMAN. Complete subfields NUMAREA, HVST, KVST, and SIGPOINT.
	PC	numeric (0 to 16 383)	Basic point code identifier. If the entry in subfield FORMAT is BASIC, enter a number to specify the PC of this office.

Channelized access on LPP/LIS (continued)

Datafilling table C7NETWRK (Sheet 4 of 6)

Field	Subfield or refinement	Entry	Explanation and action
	ZONE	numeric (0 to 31)	Zone identifier. This entry is the first part of the OPC for an international network. If the entry in subfield NETTYPE is CCITT7, enter the zone identifier you have assigned to this office according to the following guidelines: • If the entry in subfield FORMAT is INTL, enter a number from 0 to 7. • If the entry in subfield FORMAT is AUSTRIA, enter a number from 0 to 31. • If the entry in subfield FORMAT is CHINA, enter a number from 0 to 15.
	AREANETW	numeric (0 to 255)	Area network identifier. If the entry in subfield FORMAT is INTL, enter a number to specify the area/network identifier. This entry is the second part of the OPC.
	REGION	numeric (0 to 15)	Region. If the entry in subfield FORMAT is AUSTRIA, enter the region number assigned to this office. This entry is the second part of the OPC.
	EXCHANGE	numeric (0 to 127)	Exchange. If the entry in subfield FORMAT is CHINA, enter a number to specify the exchange in the zone assigned to this office. This entry is the second part of the OPC.

Channelized access on LPP/LIS (continued)

Datafilling table C7NETWRK (Sheet 5 of 6)

Field	Subfield or refinement	Entry	Explanation and action
	SIGPOINT	numeric (0 to 31)	Signal point identifier. This entry is the third part of the OPC for an international network. If the entry in subfield NETTYPE is CCITT7, enter the number of the signal point assigned to the destination office. Use the following guidelines: • If the entry in subfield FORMAT is INTL, enter a number from 0 to 7 to specify the signal point in the area/network. • If the entry in subfield FORMAT is AUSTRIA, enter a number from 0 to 31 to specify the signal point in the region. • If the entry in subfield FORMAT is CHINA, enter a number from 0 to 7 to specify the signal point in the exchange. • If the entry in subfield FORMAT is GERMAN, enter the number of the signal point in the exchange that has been assigned to the far-end switching unit for the specified network. The range is 0 to 7.
	NUMAREA	0 to 15	Numbering area. If the entry in subfield FORMAT is GERMAN, enter the area number assigned to the office.
	HVST	0 to 7	HVST area. If the entry in subfield FORMAT is GERMAN, enter the HVST number assigned to the office.
	KVST	0 to 15	KVST area. If the entry in subfield FORMAT is GERMAN, enter the KVST number assigned to the office.
NI		INTL, INTLSPARE, NATL, or NATLSPARE	Network indicator. Enter INTL, INTLSPARE, NATL, or NATLSPARE. ***Note:*** There can be more than one network of the same type, but each network must have a unique indicator.

Channelized access on LPP/LIS (continued)

Datafilling table C7NETWRK (Sheet 6 of 6)

Field	Subfield or refinement	Entry	Explanation and action
SLSROT		Y or N	Signaling link selector rotation. If the rotation of links in a linkset is required for loadsharing purposes, enter Y. Otherwise, enter N. For CCITT7 networks used in Australia, JPN7, or NTC7, enter N.
TFR		Y or N	Transfer restricted. If transfer restricted is part of the messaging protocol in the network, enter Y. Otherwise, enter N. For CCITT7 networks used in Australia, JPN7, or NTC7, enter N.
MCS		numeric (1 or 3)	Multiple congestion. Enter either 1 or 3 to indicate the level of congestion required. For international or Australian CCITT networks or NTC7, enter 1. For the Japan Public Network, enter 3.
CLUSTERS		Y or N	Cluster messages. If cluster messages can be received, enter Y. Otherwise, enter N. For CCITT7 networks used in Australia or NTC7, enter N. For the Japan Public Network, enter Y.
RCTEST		Y or N	Routeset congestion test. If a routeset congestion test is used to relieve remote routeset congestion, enter Y. Otherwise, enter N. For CCITT7 networks used in Australia, JPN7, or NTC7, enter N.

Datafill example for table C7NETWRK

The following example shows sample datafill for table C7NETWRK.

Channelized access on LPP/LIS (continued)

MAP display example for table C7NETWRK

```
   NETNAME     NODETYPE                      PTCODE
                  NI  SLSROT  TFR  MCS  CLUSTERS
            RCTEST  MTPRES  CNGCONT
-------------------------------------------------------
    NATL_NET          SSP         ANSI7 171   1   0
                       NATL       Y    Y    3         Y
                       Y       Y        Y
```

Datafilling table C7LKSET

The following table shows the datafill specific to Channelized access on LPP/LIS for table C7LKSET. Only those fields that apply directly to Channelized access on LPP/LIS are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table C7LKSET (Sheet 1 of 8)

Field	Subfield or refinement	Entry	Explanation and action
LINKSET		see subfield	Linkset. This field contains subfield NAME.
	NAME	alphanumeric (1 to 16 characters)	Linkset name. Enter a string to specify the name of the linkset. If your office contains STPS SEAS, the entry in this subfield must contain eight characters. The CCS7 linkset name can contain numeric characters only.

Channelized access on LPP/LIS (continued)

Datafilling table C7LKSET (Sheet 2 of 8)

Field	Subfield or refinement	Entry	Explanation and action
LSTYPE		ALINK,BLINK,CLINK,DLINK,ELINK, orFLINK	Linkset type. Enter the linkset type as defined by the nodes on either end as follows: • If the linkset connects an SP, an SSP, or an SCP to an STP, enter ALINK. • If the linkset connects one STP of a pair to an STP of another pair at the same level of service, enter BLINK. • If the linkset connects STP nodes to form a pair, enter CLINK. • If the linkset connects a primary STP to a secondary STP, enter DLINK. • If the linkset connects an SP, an SSP, or an SCP to a remote STP, enter ELINK. • If the linkset connects any combination of SPs, SSPs, or SCPs to one another, enter FLINK. • If the network type is TTC7, enter FLINK. • If the network type is JPN7, enter ALINK, ELINK, or FLINK.
NETNAME		network name	Network name. Enter the name of a valid network as defined in C7NETWRK.
FEPC		see subfields	Far end point code. This field contains subfield NETTYPE and its refinements. ***Note:*** The far-end PC (FEPC) of the linkset must differ from the PTCODE of the network to which the linkset belongs. This PTCODE is found by comparing the entry in field NETNAME in table C7LKSET with the same entry in table C7NETWRK.

Channelized access on LPP/LIS (continued)

Datafilling table C7LKSET (Sheet 3 of 8)

Field	Subfield or refinement	Entry	Explanation and action
	NETTYPE	JPN7, ANSI7, CCITT7, NTC7, or TTC7	Network type. Enter JPN7, NTC7, ANSI7, CCITT7, or TTC7. • If the network type is North American, enter ANSI7 and complete subfields NETWORK, CLUSTER, and MEMBER. These subfields make up the OPC, which must be unique in the network. • If the network type is international, enter CCITT7 and complete subfield FORMAT. • If the network type is Japan Public Network, enter JPN7 and complete subfields MAINAREA, SUBAREA, and AREAUNIT. • If the network type is TTC7, enter TTC7 and complete subfields MAINAREA, SUBAREA, and AREAUNIT. • If the network type is NTC7, enter NTC7 and complete subfields NMAINAREA, NSUBAREA, and NSIGPOINT. The subfields make up the FEPC.
	MAINAREA	numeric (0 to 31)	Main area. If the entry in subfield NETTYPE is TTC7 or JPN7, enter a number from 0 to 31 to specify the main area assigned to this office. This entry is the first part of the OPC.
	SUBAREA	numeric (0 to 15)	Subarea. If the entry in subfield NETTYPE is TTC7 or JPN7, enter a number from 0 to 15 to specify the subarea in the main area assigned to this office. This entry is the second part of the OPC.
	NMAINAREA	numeric (0 to 255)	NTC7 main area. If the entry in subfield NETTYPE is NTC7, enter a number to specify the main area assigned to this office. The range is from 0 to 255. This entry is the first part of the OPC.

Channelized access on LPP/LIS (continued)

Datafilling table C7LKSET (Sheet 4 of 8)

Field	Subfield or refinement	Entry	Explanation and action
	NSUBAREA	numeric (0 to 255)	NTC7 subarea. If the entry in subfield NETTYPE is NTC7, enter a number to specify the subarea in the main area assigned to this office. The range is from 0 to 255. This entry is the second part of the OPC.
	NSIGPOINT	numeric (0 to 255)	NTC7 signal point identifier. If the entry in subfield NETTYPE is NTC7, enter the number of the signal point assigned to the destination office. The range is from 0 to 255.
	AREAUNIT	numeric (0 to 127)	Area unit. If the entry in subfield NETTYPE is TTC7 or JPN7, enter a number to specify the area unit in the subarea assigned to this office. This entry is the third part of the OPC.
	NETWORK	numeric (0 to 255)	Network identifier. Enter a number to specify the network identifier you have assigned to this office. This entry is the first part of the FEPC for the network.
	CLUSTER	numeric (0 to 255)	Cluster. Enter a number to specify the cluster you have assigned to this office. This entry is the second part of the FEPC.
	MEMBER	numeric (0 to 255)	Member. Enter a number to specify the member within the cluster that you have assigned to this office. This entry is the third part of the FEPC.

Channelized access on LPP/LIS (continued)

Datafilling table C7LKSET (Sheet 5 of 8)

Field	Subfield or refinement	Entry	Explanation and action
	FORMAT	BASIC, INTL, AUSTRIA, CHINA, or GERMAN and see subfields	CCITT format. If the entry in subfield NETTYPE is CCITT7, enter BASIC, INTL, AUSTRIA, or CHINA according to the following guidelines: • If the PC used is basic international, enter BASIC and complete subfield PC. • If the PC used is international, enter INTL and complete subfields ZONE, AREANETW, and SIGPOINT. • If the PC used is for Austria, enter AUSTRIA and complete subfields ZONE, REGION, and SIGPOINT. • If the PC used is for China, enter CHINA and complete subfields ZONE, EXCHANGE, and SIGPOINT.
	PC	numeric (0 to 16 383)	Basic point code identifier. If the entry in subfield FORMAT is BASIC, enter a number to specify the FEPC of this office.
	ZONE	numeric (0 to 31)	Zone identifier. This entry is the first part of the FEPC for an international network. If the entry in subfield NETTYPE is CCITT7, enter the zone identifier assigned to this office according to the following guidelines: • If the entry in subfield FORMAT is INTL, enter a number from 0 to 7. • If the entry in subfield FORMAT is AUSTRIA, enter a number from 0 to 31. • If the entry in subfield FORMAT is CHINA, enter a number from 0 to 15.
	AREANETW	numeric (0 to 255)	Area network identifier. If the entry in subfield FORMAT is INTL, enter a number to specify the area/network identifier. This entry is the second part of the FEPC.
	REGION	numeric (0 to 15)	Region. If the entry in subfield FORMAT is AUSTRIA, enter a number to specify the region number assigned to this office. This entry is the second part of the FEPC.

Channelized access on LPP/LIS (continued)

Datafilling table C7LKSET (Sheet 6 of 8)

Field	Subfield or refinement	Entry	Explanation and action
	EXCHANGE	numeric (0 to127)	Exchange. If the entry in subfield FORMAT is CHINA, enter a number to specify the exchange in the zone assigned to this office. This entry is the second part of the FEPC.
	SIGPOINT	numeric (0 to 31)	Signal point identifier. This entry is the third part of the FEPC for an international network. If the entry in subfield NETTYPE is CCITT7, enter the number of the signal point assigned to the destination office according to the following guidelines: • If the entry in subfield FORMAT is INTL, enter a number from 0 to 7 to specify the signal point in the area/network. • If the entry in subfield FORMAT is AUSTRIA, enter a number from 0 to 31 to specify the signal point in the region. • If the entry in subfield FORMAT is CHINA, enter a number from 0 to 7 to specify the signal point in the exchange. • If the entry in subfield FORMAT is GERMAN, enter the number of the signal point in the exchange that has been assigned to the far-end switching unit for the specified network. The range is 0 to 7.
	NUMAREA	0 to 15	Numbering area. If the entry in subfield FORMAT is GERMAN, enter the area number assigned to the office.
	HVST	0 to 7	HVST area. If the entry in subfield FORMAT is GERMAN, enter the HVST number assigned to the office.
	KVST	0 to 15	KVST area. If the entry in subfield FORMAT is GERMAN, enter the KVST number assigned to the office.
FECLLI		alphanumeric (16 characters)	Far end CLLI. Enter a string to specify the CLLI of the office at the far end of the linkset.

Channelized access on LPP/LIS (continued)

Datafilling table C7LKSET (Sheet 7 of 8)

Field	Subfield or refinement	Entry	Explanation and action
SIGLKTST		Y or N	Signaling linkset. If an SL test is to be performed as part of link activation, enter Y. Otherwise, enter N. If the network type is TTC7 or JPN7, enter N.
RSTEST		Y or N	Routeset test. If a routeset test is to be performed when this linkset comes into service, enter Y. Otherwise, enter N. For TTC7 or JPN7 networks or CCITT7 networks used in Australia, this field should be set to N.
INHTEST		Y or N	Management inhibit test. This test audits the inhibit indicators at either end of a linkset and corrects any inconsistencies. If the inhibit test is to run when any link is inhibited, enter Y. Otherwise, enter N. The default value is N. For CCITT7 networks used in Australia, TTC7, NTC7, or JPN7, this field should be set to N.
Q704		numeric (0 to 31)	Q704 time index. Enter the index number of the timer tuple in the Q704 set of timers datafilled in table C7TIMER.
CNGSTN		numeric (0 to 63)	Congestion index. From table C7CNGSTN, enter a number to index the tuple that defines the congestion thresholds used by this linkset.
NUMFLAGS		numeric (1 to 255)	Number of flags sent between consectuive signaling units. Enter the number of flags sent between consecutive signaling units. The larger the number of flags specified, the more slowly the message signaling units can be sent over any one link, and the lighter the load is on the far-end signaling terminal. The default value is 1. It sends a single flag between consecutive signaling units and is used for existing data to preserve existing behavior. For CCITT7 networks used in Australia, the value for this field is usually set to 1. The value cannot be greater than 32.

Channelized access on LPP/LIS (continued)

Datafilling table C7LKSET (Sheet 8 of 8)

Field	Subfield or refinement	Entry	Explanation and action

MTPRES		Y or N	*MTP restart*
			
			Enter Y to activate the MTP restart procedure for network type ANSI7, CCITT7 or NTC7. Otherwise, enter N.
			
			The default value is Y.
			
			Enter N for network types TTC7 and JPN7. If operating company personnel attempt to add value Y, the following message appears.
			
			`MTP Restart is not supported for TTC7 or JPN7 networks. MTPRES must be set to N.`
			
			Note: If an MTP restart procedure is in progress, the changed value for field MTPRES takes effect after the completion of the in-progress MTP restart procedure. The following message is issued.
			
			`Note:`
			
			`If an MTP Restart procedure is in progress, the modified control parameter shall be effective at the completion of that procedure.`

CHNGSLS		N	This field was created for feature enhancements and is not currently used. The default is N.

Datafill example for table C7LKSET

The following example shows sample datafill for table C7LKSET.

MAP display example for table C7LKSET

```
LINKSET     LSTYPE     NETNAME     FEPC
FECLLI       SIGLKTST  RSTEST      INHEST
Q704     CNGSTN     NUMFLAGS
------------------------------------------------------
CA_LS01     ALINK     NATL_NET     ANSI7 26 27 0
CA_LS01     N         N            Y
0         0         1
```

Channelized access on LPP/LIS (continued)

Datafilling table C7LINK

The following table shows the datafill specific to Channelized access on LPP/LIS for table C7LINK. Only those fields that apply directly to Channelized access on LPP/LIS are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table C7LINK (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
LINKNAME		see subfields	CCS7 link name. This field is a multiple of LINKSET and LINKSLC.
	LINKSET	alphanumeric (1 to 16 characters)	Linkset name. Enter a string to specify the linkset of which this link is a member. This linkset must be datafilled in table C7LKSET.
	LINKSLC	numeric (0 to 15)	Signaling link number. Enter a number to specify the SL. It identifies the link in the linkset, and must be the same at both ends of the linkset. The LINKSET and the LINKSLC uniquely identify a particular link.
LINKDATA		see subfield	C7link data area. This field contains subfield ALLOC.
	ALLOC	LIUBASIC or LIU-CHANNEL	Allocation scheme. This subfield determines the type of link being datafilled. Enter LIUBASIC if an LIU7 or HSLR is used to meet the throughput requirements of an STP. Complete subfields LIUTYPE and LIUNO. Enter LIUCHANNEL if the LIU7 or HSLR is a dedicated termination for the specified signaling trunk. Complete subfields LIUTYPE, LIUNO, and TL.
	LIUTYPE	LIU7, HSLR	Link interface unit type. Enter HSLR for high-sprred link routers. Otherwise, enter LIU7.
	LIUNO	numeric (0 to 511)	Link interface unit number. Enter a number for the LIU7 or HSLR.
	TL	see subfields	Transmission link. This subfield contains subfields CLLI and EXTRKNM.
	CLLI	see CLLI	Digital trunk CLLI. Enter the CLLI of the digital trunk used to transmit data for the link.

Channelized access on LPP/LIS (continued)

Datafilling table C7LINK (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	EXTRKNM	numeric (0 to 9999)	External trunk number. Enter a number to specify the external trunk of the digital trunk.
Q703		numeric (0 to 31)	C7 timer table index. Enter a number to specify the timer tuple datafilled in table C7TIMER.
Q707		numeric (0 to 31)	C7 timer table index. Enter a number to specify the timer tuple datafilled in table C7TIMER.
LINKOPT		see subfield	C7 link options. This field consists of a vector of up to four multiples of the subfield OPTIONS. Enter $ if no options are to be datafilled.
	OPTIONS	SLMPR	Options. If the link is to be included in the SL Marginal Performance Report, enter SLMPR.

Datafill example for table C7LINK

The following example shows sample datafill for table C7LINK.

MAP display example for table C7LINK

```
LINKNAME          LINKDATA
Q703       Q707   LINKOPT

-------------------------------------------------------
CA_LS01  0        LIUCHANNEL  LIU7  204  CA_TRK  0
0        0
```

Channelized access on LPP/LIS (continued)

Error messages for table C7LINK

The following error messages apply to table C7LINK.

Error messages for table C7LINK

Error message	Explanation and action
`LINKSET would exceed the maximum of 4 links for the LSTYPE selected`	The maximum number of links in a linkset in networks AUSTR7 and CCITT7 and LSTYPE of BLINK, CLINK, DLINK is 4. If the link being added exceeds the maximum number of links allowable for this LSTYPE, the tuple is rejected.
`LINKSET would exceed the maximum of 8 links for the LSTYPE selected`	The maximum number of links in a linkset in networks ANSI7 and LSTYPE of BLINK, CLINK, DLINK is 8. If the link being added exceeds the maximum number of links allowable for this LSTYPE, the tuple is rejected.
`Incorrect LIU7 link resource type for LIUCHANNEL allocation`	The LIU7 specified in this tuple has not been recognized. Correct the entry.
`The specified LIU resource is not datafilled in the LIUINV table`	The LIU7 specified in this tuple must first be datafilled in table LIUINV.

Datafilling table C7RTESET

The following table shows the datafill specific to Channelized access on LPP/LIS for table C7RTESET. Only those fields that apply directly to Channelized access on LPP/LIS are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table C7RTESET (Sheet 1 of 6)

Field	Subfield or refinement	Entry	Explanation and action
ROUTESET		see subfield	Routeset name. This field contains subfield DESTNAME.
	DESTNAME	alphanumeric (1 to 16 characters)	Destination name. Enter a string to specify the name of the routeset that is unique to the switching office.
NETNAME		alphanumeric (1 to 16 characters)	Network name. Enter the name of the network that is unique to the switching office. This name must already be datafilled in table C7NETWRK. The CCS7 network name can consist of numeric characters only.

Channelized access on LPP/LIS (continued)

Datafilling table C7RTESET (Sheet 2 of 6)

Field	Subfield or refinement	Entry	Explanation and action
TFPBCAST		Y or N	Transfer prohibited broadcast. If the switch is an STP, and a routeset management message is broadcast to all adjacent SPs when the routeset becomes unavailable, enter Y. If no messages are broadcast or the switch is not an STP, enter N.
DPC		see subfields	Destination point code. This field contains subfield NETTYPE and its refinements.
	NETTYPE	JPN7, ANSI7, CCITT7, NTC7, or TTC7 and see subfields	Network type. This subfield contains the network type. If the network type is North American, enter ANSI7 and complete a vector of up to three multiples of subfield PC. If the network type is international, enter CCITT7 and complete subfield FORMAT. If the network type is Japan Public Network, enter JPN7 and complete a vector of up to three multiples of subfield PC. If the network type is TTC7, enter TTC7 and complete subfields MAINAREA, SUBAREA, and AREAUNIT. If the network type is NTC7, enter NTC7 and complete subfields NMAINAREA, NSUBAREA, and NSIGPOINT. The three subfields to be datafilled make up the DPC, which must be unique within the same network.

Channelized access on LPP/LIS (continued)

Datafilling table C7RTESET (Sheet 3 of 6)

Field	Subfield or refinement	Entry	Explanation and action
	FORMAT	BASIC,INTL, AUSTRIA, CHINA, or GERMAN and see subfields	CCITT format. If the entry in subfield NETTYPE is CCITT7, enter BASIC, INTL, AUSTRIA, or CHINA, according to the following guidelines: • If the PC used is basic international, enter BASIC and complete subfield PC. • If the PC used is international, enter INTL and complete subfields ZONE, AREANETW, and SIGPOINT. • If the PC used is for Austria, enter AUSTRIA and complete subfields ZONE, REGION, and SIGPOINT. • If the PC used is for China, enter CHINA and complete subfields ZONE, EXCHANGE, and SIGPOINT. • If the PC used is for Germany, enter GERMAN and complete subfields NUMAREA, HVST, KVST, and SIGPOINT.
	PC	numeric (0 to 16 383)	Basic point code identifier. If the entry in subfield FORMAT is BASIC, enter a number from 0 to 16 383 to specify the PC of this office. If the entry in subfield NETTYPE is ANSI7, enter a vector of up to three values for the DPC. • The first value is a number from 0 to 255 to specify the network identifier assigned to this office. This entry is the first part of the DPC. • The second value is a number from 0 to 255 to specify the cluster assigned to this office. This entry is the second part of the DPC. • The third value is a number from 0 to 255 to specify the member within the cluster assigned to this office. This entry is the third part of the DPC.
	MAINAREA	numeric (0 to 31)	Main area. If the entry in subfield NETTYPE is TTC7, enter a number from 0 to 31 to specify the main area assigned to this office. This entry is the first part of the DPC.

Channelized access on LPP/LIS (continued)

Datafilling table C7RTESET (Sheet 4 of 6)

Field	Subfield or refinement	Entry	Explanation and action
	SUBAREA	numeric (0 to 15)	Subarea. If the entry in subfield NETTYPE is TTC7, enter a number from 0 to 15 to specify the subarea in the main area assigned to this office. This entry is the second part of the DPC.
	NMAINAREA	numeric (0 to 255)	NTC7 main area. If the entry in subfield NETTYPE is NTC7, enter a number from 0 to 255. The number specifies the main area assigned to this office. This entry is the first part of the DPC.
	NSUBAREA	numeric (0 to 255)	NTC7 subarea. If the entry in subfield NETTYPE is NTC7, enter a number from 0 to 255. The number specifies the subarea in the main area assigned to this office. This entry is the second part of the DPC.
	NSIGPOINT	numeric (0 to 255)	NTC7 signal point identifier. If the entry in subfield NETTYPE is NTC7, enter the number of the SP assigned to the destination office. The number to enter is 0 to 255.
	AREAUNIT	numeric (0 to 127)	Area unit. If the entry in subfield NETTYPE is TTC7, enter a number to specify the area unit in the subarea assigned to this office. This entry is the third part of the DPC.
	ZONE	numeric (0 to 31)	Zone identifier. This entry is the first part of the DPC for an international network. If the entry in subfield NETTYPE is CCITT7, enter the zone identifier assigned to this office. Use the following guidelines: • If the entry in subfield FORMAT is INTL, enter a number from 0 to 7. • If the entry in subfield FORMAT is AUSTRIA, enter a number from 0 to 31. • If the entry in subfield FORMAT is CHINA, enter a number from 0 to 15.

Channelized access on LPP/LIS (continued)

Datafilling table C7RTESET (Sheet 5 of 6)

Field	Subfield or refinement	Entry	Explanation and action
	AREANETW	numeric (0 to 255)	Area network identifier. If the entry in subfield FORMAT is INTL, enter a number to specify the area/network identifier. This entry is the second part of the DPC.
	REGION	numeric (0 to 15)	Region. If the entry in subfield FORMAT is AUSTRIA, enter the region number assigned to this office. This entry is the second part of the DPC.
	EXCHANGE	numeric (0 to 127)	Exchange. If the entry in subfield FORMAT is CHINA, enter a number to specify the exchange in the zone assigned to this office. This entry is the second part of the DPC.
	SIGPOINT	numeric (0 to 31)	Signal point identifier. This entry is the third part of the DPC for an international network. If the entry in subfield NETTYPE is CCITT7, enter the number of the SP assigned to the destination office. Use the following guidelines: • If the entry in subfield FORMAT is INTL, enter a number from 0 to 7 to specify the signal point in the area/network. • If the entry in subfield FORMAT is AUSTRIA, enter a number from 0 to 31 to specify the signal point in the region. • If the entry in subfield FORMAT is CHINA, enter a number from 0 to 7 to specify the signal point in the exchange. • If the entry in field FORMAT is GERMAN, enter a numeric value between 0 and 7 specifying the signal point code of the exchange.
	NUMAREA	0 to 15	*Numbering Area* If the entry in field FORMAT is GERMANY, enter the area number assigned to the office.
	HVST	0 to 7	*HVSt* If the entry in field FORMAT is GERMANY, enter the HVSt area assigned to the office.

Channelized access on LPP/LIS (end)

Datafilling table C7RTESET (Sheet 6 of 6)

Field	Subfield or refinement	Entry	Explanation and action
	KVST	0 to 15	*KVSt* If the entry in field FORMAT is GERMANY, enter the KVSt area assigned to the office.
ROUTES			Signal point routes. This field is a multiple of LINKSET and COST. It is an alphanumeric vector of up to six elements. Enter $ to signify the end of the vector.
	LINKSET	alphanumeric (1 to 16 characters)	Linkset name. Enter the linkset name previously defined in table C7LKSET, which makes up part of the routeset.
	COST	numeric (0 to 99)	Cost. Enter a number to define the relative cost of using this route. The cost of each route must be equal to or greater than that of the route defined before it. Hence, this number also defines the priority of the routes in the routeset.

Datafill example for table C7RTESET

The following example shows sample datafill for table C7RTESET.

MAP display example for table C7RTESET

```
ROUTESET         NETNAME           TFBCAST
DPC                                          ROUTES
-------------------------------------------------------------
CA_RS01          NATL_NET           N
ANS17   (26)     (27)    (0) $              (CA_LS01  0) $
```

Translation verification tools

Channelized access on LPP/LIS does not use translation verification tools.

SERVORD

Channelized access on LPP/LIS does not use SERVORD.

CMS NAC Interface-Canada only

Ordering codes

Functional group ordering code: CMS00001

Release applicability

TL02 and up

CMS NAC Interface-Canada only was introduced in BCS29.

Prerequisites

To operate, CMS NAC Interface-Canada only has the following prerequisites:

- BASE0001
- BAS00003
- TEL00008

Description

Call Management Services (CMS), called CLASS in the United States, identifies a set of enhancements based on the availability of the calling party number at the call destination.

These enhancements include the following:

- automatic call back (ACB)
- automatic recall (AR)
- calling number display (CND)
- customer-originated trace (COT)
- incoming call screening

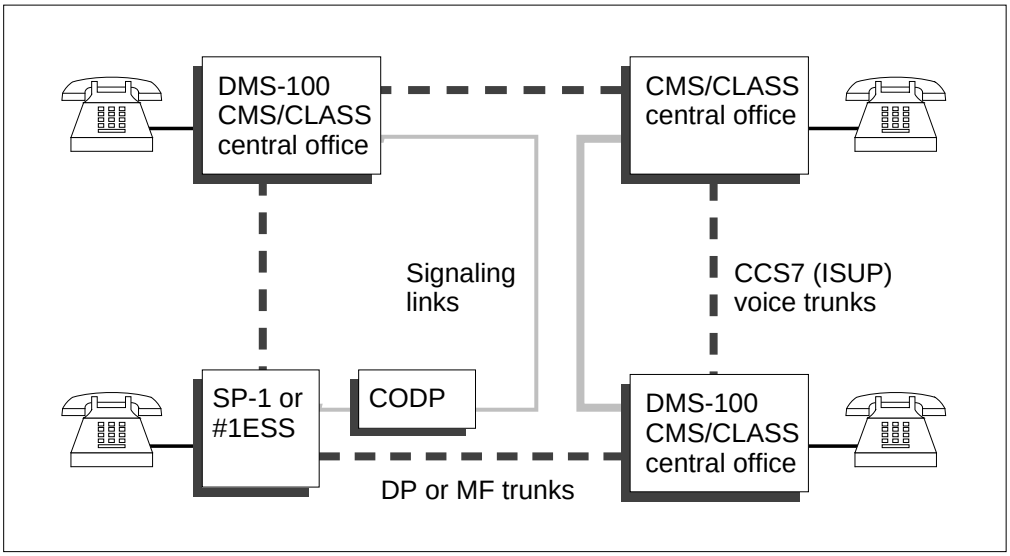
A CMS network is made up of several CMS/CLASS central offices that have the following functions:

- support subscribers in the same city or district
- support nodal (single switch) and network (multiple switch) operation of CMS features
- interconnect CCS7 signaling links (SL) and voice trunks

The following figure illustrates a typical CMS network.

CMS NAC Interface-Canada only (continued)

Typical CMS network including an SP-1 or #1ESS



Operation

The CCS7 signaling links that connect the CMS/CLASS central offices to each other are used for the following services:

- calling number delivery—the calling number is passed from origin to destination in the initial address message (IAM)
- destination line status—the ACB and AR features use interchanges of CSS7 transaction capability application part (TCAP) messages to
  - — request and receive destination line information prior to setting up a call
  - — initiate termination scanning of a busy line and receive notification when the line becomes idle
- origin directory number (DN) validation—before a DN is added to an incoming call screening list, an interchange of CCS7 TCAP messages is used to obtain a DN validation report from the office serving that DN.

A CMS network can be extended to include stored program control (SPC) SP-1 or #1ESS switches. Although subscribers served from an SP-1 or #1ESS switch cannot be offered CMS/CLASS services, both these switches can be integrated into the CMS network by equipping them with a central office data processor (CODP).

The CMS NAC Interface package provides the signaling to support CLASS features. It provides the additional capabilities needed to connect a DMS-100 with one or more CODPs and the associated SP-1 or #1ESS switches.

CMS NAC Interface-Canada only (continued)

The CODP provides the following services:

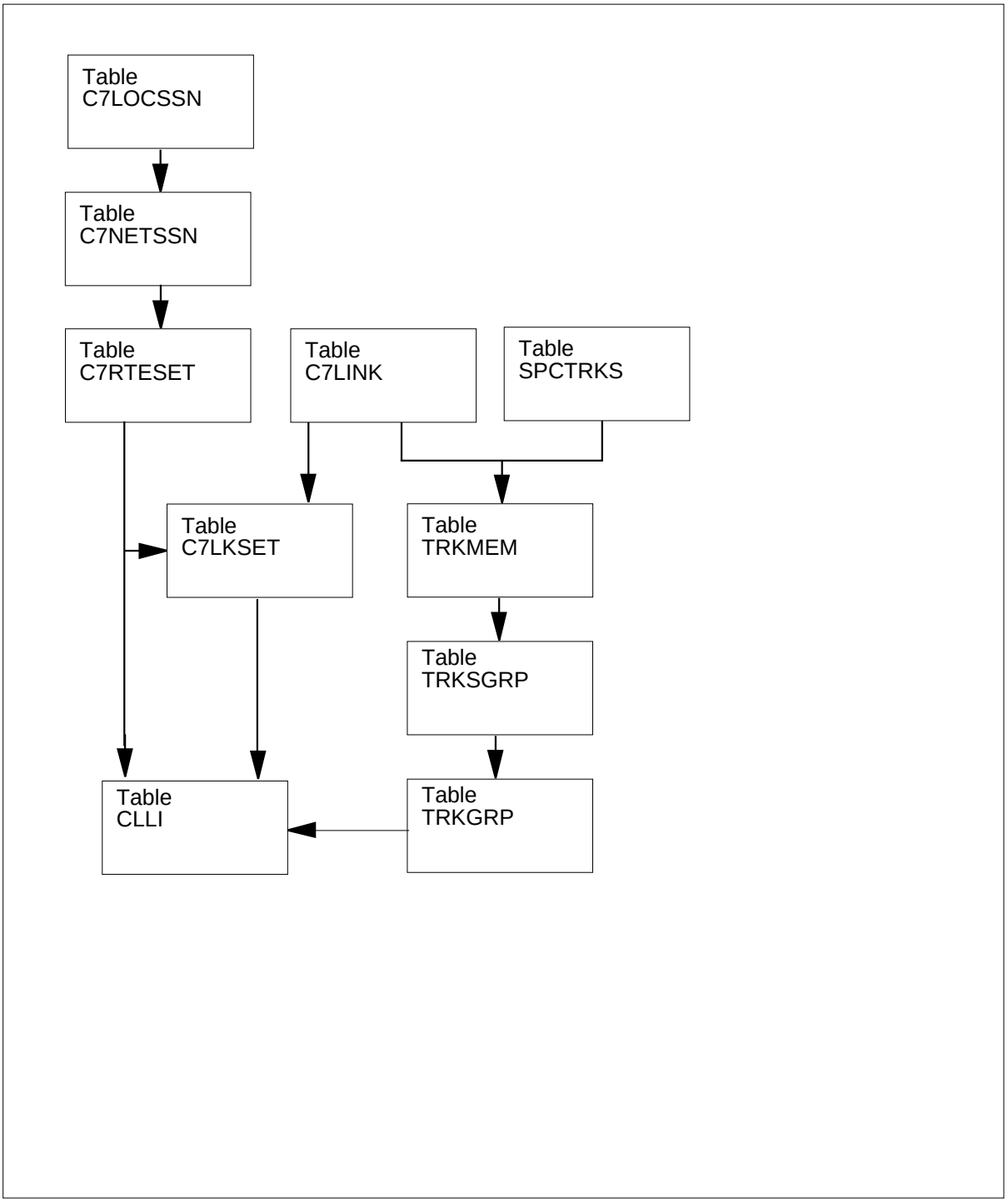
- calling number delivery for calls originating from the SPC that are routed to a DMS-100 CMS/CLASS central office
- a reply to line status query messages and termination scan-until-idle requests from any CMS/CLASS central office
- a reply to DN validation requests from any CMS/CLASS central office

Translations table flow

The CMS NAC Interface-Canada only translation process is shown in the flowchart that follows.

CMS NAC Interface-Canada only (continued)

Table flow for CMS NAC Interface-Canada only



CMS NAC Interface-Canada only (continued)

The following table lists the datafill content used in the flowchart.

Datafill example for CMS NAC Interface-Canada only

Item	Example data
CLLI	COMD_COMR_T2_MF
C7NETSSN	CODP1 (CMS 250) (CLASS 251) $
C7LOCSSN	CMS 250 1 N N $
TRKMEM	COMD_COMR_T2_MF 6 0 DTC 1 3 7
SPCTRKS	COMD_COMR_T2_MF 6 58 2

Limitations and restrictions

The following limitations and restrictions apply to CMS NAC Interface-Canada only:

- SPC switches do not support CMS subscribers.
- Toll (intercluster) CMS is not supported.
- Only T1 and T2 trunk group type SPC trunks with MF and DP signaling are supported.
- SPC trunks using overlap outpulsing or cut-through dialing are not supported.
- SPC switches do not support Calling Party Name or Original Called Number (OCN).
- If a TCAP Calling Line Information (CLI) message has not arrived when the call process attempts to retrieve it, the call process does not wait.
- Multiple CLI messages cannot be queued against a trunk circuit. An old CLI is overwritten by a new one.
- Calls on DP trunks cannot be completed with a CLI if the last four dialed digits are altered by DMS translation.
- Network Attendant Service (NAS) is not supported.
- If interworking is encountered and no OCN has been received, call forwarding is not sent to the next office.
- All members of a trunk subgroup must be datafilled in table SPCTRKS.
- Table SPCTRKS refers to entries in table TRKMEM. Before deleting an entry in table TRKMEM, the corresponding entry in table SPCTRKS must be deleted.

CMS NAC Interface-Canada only (continued)

Before office parameters are datafilled, obtain the following:

- busy hour call handling times. The following times are required:
  - — average call holding time
  - — worst-case time difference between MF or DP trunk seizure by the SPC switch and the last digit collected at the DMS-100 switch
- maximum maintenance call rate—the frequency (calls per second) that CLID messages requiring a response message are generated by an SPC

Interactions

The CMS NAC Interface-Canada only interacts with the following functionalities:

- SPC-CMS data structures Data blocks hold the incoming calling line identification (CLID) information until the call has arrived on the per trunk signaling (PTS) trunk.
- SPC-CMS table control This feature provides table SPCTRKS, which allows the assignment of a numeric identifier to each circuit connecting the DMS to an SPC.
- SPC-CMS TCAP applications This feature implements the TCAP interface protocol. It requires the data block utilities to pass the CLID information to call process and provides the necessary error messaging for the CLID protocol.
- SPC-CMS call processing This feature retrieves the data block enqueued against an incoming call. The CLID information is associated with the call history block and is treated as though it had been received in an IAM.
- SPC-CMS logs and OMs This feature generates logs and operational measurements (OM) as required during call processing.

Activation/deactivation by the end user

CMS NAC Interface-Canada only requires no activation or deactivation by the end user.

Billing

CMS NAC Interface-Canada only does not affect billing.

Station Message Detail Recording

CMS NAC Interface-Canada only does not affect Station Message Detail Recording.

CMS NAC Interface-Canada only (continued)

Datafilling office parameters

The following table shows the office parameters used by CMS NAC Interface-Canada only. For more information about office parameters, refer to *Office Parameters Reference Manual*.

Office parameters used by CMS NAC Interface-Canada only (Sheet 1 of 2)

Table name	Parameter name	Explanation and action
OFCENG	SPCCLITIMEOUT	Specifies how long the CLI from an SPC switch remains accessible by the voice call incoming from the SPC switch. The default value is 9 s.
OFCENG	DYNAMIC_MEMORY_SIZE,pool FTRQAGENTS	Dynamically allocates data store for the seven-word data blocks used to store control information for features temporarily suspended while awaiting another event. The default value is 0.
OFCENG	DYNAMIC_MEMORY_SIZE,pool FTRQ8WAREAS	Dynamically allocates data store for the 12-word data blocks used to store control information for features temporarily suspended while awaiting another event. The default value is 0.
OFCENG	DYNAMIC_MEMORY_SIZE,pool FTRQ16WAREAS	Dynamically allocates data store for the 20-word data blocks used to store control information for features temporarily suspended while awaiting another event. The default value is 0.
OFCENG	NO_OF_HIS_CONTROL_BLKS	Allocates storage for incoming calls from SPC (with CODP). When information supplied from the CODP is associated with a voice call, a CCS7 control record requiring one call control block is created. The default value is 50.
OFCENG	NO_OF_HIS_DATA_BLKS	Allocates storage for incoming calls from SP-1 with CODP and #1ESS with CODP. When information supplied from the CODP is associated with a voice call, a CCS7 control record requiring one call history block is created. The default value is 50.

CMS NAC Interface-Canada only (continued)

Office parameters used by CMS NAC Interface-Canada only (Sheet 2 of 2)

Table name	Parameter name	Explanation and action
OFCENG	NO_0F_MEDIUM_EXT_BLKS	Specifies the number of extension blocks used by the CMS TCAP subsystem.
OFCVAR	ACMS_NOC_LOG_ON	Enables or disables the ACMS105 log and thereby reduces volume of logs. The default value is set to N so that the ACMS105 log is not generated unless specifically requested.

Datafill sequence

The following table lists the tables that require datafill to implement CMS NAC Interface-Canada only. The tables are listed in the order in which they are to be datafilled.

Datafill tables required for CMS NAC Interface-Canada only (Sheet 1 of 2)

Table	Purpose of table
C7LOCSSN	The CCS7 local subsystem table provides information for the local subsystem and directs incoming CMS TCAP messages to the local CMS subsystem.
C7NETSSN	The CCS7 network subsystem routing table defines the set of remote point codes and the subsystems to which the SCCP routes messages and sets up monitoring of remote CMS subsystems.
CLLI	The common language location identifier table allocates a unique common language location identifier (CLLI) to each transmission link, linkset, and routeset.
C7RTESET	The CCS7 routeset table associates each linkset with a routeset.
C7LKSET	The CCS7 linkset table defines the characteristics of each linkset including destination point code (DPC) and linkset name used at the far end.
C7LINK	The CCS7 link table associates each linkset with a physical trunk, a channel on that trunk, and a pool of signaling terminals (ST).
SPCTRKS	The stored program control trunks table contains entries that permit the mapping of an SPC trunk index, supplied in a TCAP CLID message, to a trunk circuit name, and associates a unique trunk index with each multifrequency (MF) or dial pulse (DP) trunk from SPC.
TRKMEM	The trunk member table lists the data associated with each analog or digital trunk and defines the position of the digital trunk controller (DTC) for each transmission link.

CMS NAC Interface-Canada only (continued)

Datafill tables required for CMS NAC Interface-Canada only (Sheet 2 of 2)

Table	Purpose of table
TRKSGRP	The trunk subgroup table defines the type of trunk and signaling used.
TRKGRP	The trunk group table defines the type of trunk and signaling used.

Datafilling table C7NETSSN

The following table shows the datafill specific to CMS NAC Interface-Canada only for table C7NETSSN. Only those fields that apply directly to CMS NAC Interface-Canada only are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table C7NETSSN

Field	Subfield or refinement	Entry	Explanation and action
PCNAME		alphanumeric (1 to 16 characters)	Point code (PC) name. Enter a point code common language identifier (CLLI) defined by the operating company to identify a PC in the CCS7 network. Routing information for this PC must be datafilled in table C7RTESET. This CLLI corresponds to the remote PC where the subsystems are located.
SSNAMES		see subfields	Subsystem names and numbers. This field is a vector of up to 27 multiples of subfields SSNAME and SSNUMBER. Separate each entry in the vector by a blank space and enter $ to indicate the end of the vector. Where the vector is nil, leave the subfields blank and enter $.
	SSNAME	CMS	Subsystem name. Enter CMS for call management service.

Datafill example for table C7NETSSN

The following example shows sample datafill for table C7NETSSN.

CMS NAC Interface-Canada only (continued)

MAP display example for table C7NETSSN

```
PCNAME                                          SSNAMES
_____________________________________________________________
CODP1                          (CMS 250)  (CLASS 251)  $
```

Datafilling table C7LOCSSN

The following table shows the datafill specific to CMS NAC Interface-Canada only for table C7LOCSSN. Only those fields that apply directly to CMS NAC Interface-Canada only are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table C7LOCSSN

Field	Subfield or refinement	Entry	Explanation and action
SSNAME		CMS	Subsystem name. The user of a signaling connection control part (SCCP) is known as a subsystem. Enter CMS to specify the call management service subsystem.
SSNUMBER		numeric (2 to 254)	Subsystem number. Enter a numeric value for the subsystem number at the specified PC. The subsystem number must be unique within table C7LOCSSN. Entries outside the 2 to 254 range are not valid.

Datafill example for table C7LOCSSN

The following example shows sample datafill for table C7LOCSSN.

CMS NAC Interface-Canada only (continued)

MAP display example for table C7LOCSSN

```
SSNAME   SSNUMBER   MININST   REPLINFO   TFMI   PCNAMES
_____________________________________________________
   CMS       250         1          N      N         $
```

Datafilling table TRKMEM

The following table shows the datafill specific to CMS NAC Interface-Canada only for table TRKMEM. Only those fields that apply directly to CMS NAC Interface-Canada only are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table TRKMEM (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
CLLI		alphanumeric (1 to 16 characters)	Common language location identifier. Enter a string of up to 16 alphanumeric characters to specify the code assigned to the trunk. Enter the code assigned to the trunk group in the CLLI table.
EXTRKNUM		numeric	External trunk number. Enter the external trunk number assigned to the trunk groups using the automatic identification of outward dialing (AIOD) option. The external trunk number must be unique over all trunks and lines using the same AIOD group.
SGRP		numeric	Subgroup. Enter the subgroup number to which the trunk is assigned.
MEMVAR		see subfield	Member variable. This field consists of subfield PMTYPE and its refinements.

CMS NAC Interface-Canada only (continued)

Datafilling table TRKMEM (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	PMTYPE	DTC, ADTC, IDTC, or PDTC and see subfields	Peripheral module type. Enter the PMTYPE on which the trunk is mounted. If the PMTYPE is DTC complete the following refinements: • DTCNO • DTCCKTNO • DTCCKTTS If the PMTYPE is ADTC, IDTC, or PDTC complete the following refinements: • DEQNO • DEQCKTNO • DEQCKTTS
	DTCNO	numeric (0 to 511)	Digital trunk controller number. Enter a number from 0 to 511 to specify the DTC to which the trunk group member is assigned.
	DTCCKTNO	numeric (0 to 19)	Digital trunk controller circuit number. Enter a number from 0 to 19 to specify the DTC circuit board to which the trunk group member is assigned.
	DTCCKTTS	numeric (1 to 24)	Digital trunk controller circuit time slot. Enter a number from 1 to 24 to specify the DTC circuit board time slot to which the trunk group member is assigned.
	DEQNO	numeric (0 to 511)	Digital equipment number. Enter a number from 0 to 511 to specify the digital equipment number to which the trunk group member is assigned.
	DEQCKTNO	numeric (0 to 19)	Digital equipment circuit number. Enter a number from 0 to 19 to specify the digital equipment circuit card to which the trunk group member is assigned.
	DEQCKTTS	numeric (0 to 31)	Digital equipment circuit time slot. Enter a number from 1 to 31 to specify the digital equipment circuit card time slot to which the trunk group member is assigned.

Datafill example for table TRKMEM

The following example shows sample datafill for table TRKMEM.

MAP display example for table TRKMEM

```
                CLLI   EXTRKNM    SGRP        MEMVAR
_____________________________________________________________
COMD_COMR_T2_MF         6       0     DTC 1 3 7
```

Datafilling table SPCTRKS

The following table shows the datafill specific to CMS NAC Interface-Canada only for table SPCTRKS. Only those fields that apply directly to CMS NAC Interface-Canada only are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table SPCTRKS

Field	Subfield or refinement	Entry	Explanation and action
TRKNAME		see subfields	Trunk name. This field is the key to the table and must first be datafilled in table TRKMEM. It contains subfields CLLI and MEMNAME.
	CLLI	alphanumeric (1 to 16 characters)	Common language location identifier. Enter a string of up to 16 alphanumeric characters to specify the code assigned to the trunk.
	MEMNAME	numeric (0 to 9999)	Trunk group member. Enter a number from 0 to 9999 to specify the trunk group member.
SPCTKIDX		numeric (0 to 8191)	Stored program control trunk index. Enter a number from 0 to 8191 to identify the SPC trunk circuit.
ADMINNUM		numeric (0 to 31)	Administration number. Enter a number from 0 to 31 to identify the SPC switch from which the trunk circuit originates.

Datafill example for table SPCTRKS

The following example shows sample datafill for table SPCTRKS.

CMS NAC Interface-Canada only (end)

MAP display example for table SPCTRKS

```
            TRKNAME       SPCTKIDX   ADMINNUM
_____________________________________________________
COMD_COMR_T2_MF  6             58          2
```

Translation verification tools

CMS NAC Interface-Canada only does not use translation verification tools.

SERVORD

CMS NAC Interface-Canada only does not use SERVORD.

NPA splits

Ordering codes

NPA splits has no ordering codes.

Release applicability

TL03 and up

Prerequisites

NPA splits has no prerequisites.

Description

NPA split is a term applied to all activities that are required for the introduction of a new numbering plan area (NPA) into an office. This can involve splitting an NPA into two or more NPAs or replacing a current NPA with a new NPA.

An NPA split is required because a calling area has expanded due to population growth.

The NPA split procedure discussed in this document is a data extension followed by a dump and restore. This procedure requires interaction between the Nortel (Northern Telecom) regional software systems engineer and the operating company to determine what changes are required, as well as what tables each party is responsible for. A test image can be sent to assist the regional engineer in determining what changes are to be completed for a particular office. Before the dump and restore takes place, a frozen image must be submitted, the files must be edited, and a data tape must be created. After the dump and restore process is complete and the tapes are shipped to the site, the data is applied.

Data changes

The operating company should build such tables as HNPACONT, FNPACONT, and their associated subtables prior to the shipment of the test image. In some cases, this is not possible (such as the NPA Swap).

Once this information is determined, a translations strategy can be planned by the operating company or by the operating company and the regional engineer.

Feature mix

The major functional group mix must be reviewed to determine the amount of change required for each NPA split type.

NPA splits (continued)

The following areas are affected by NPA splits:

- Meridian Digital Centrex (MDC)
- Equal Access (EA)
- TOPS Host
- TOPS Remote
- a combination of the above

Refer to the appropriate translations section of this document for more information.

Operation

The types of changes that are necessary for an office to accomplish an NPA split depend on the location of the office in the network.

The following are possible NPA split configurations:

- SWAP-type A
- SPLIT-type B
- REHOME-type C
- DMS-100/200 switch-type D
- DMS-200 switch SPLIT-type E

SWAP-type A split

A type A split is done in an office in which a DMS-100 switch is homed to a DMS-200 switch. In this configuration, the NPA changes for all the occurrences in the switch. The number of NPAs in the switch does not change. The DMS-100 switch remains homed to the same DMS-200 switch office as before the split. Routing remains static.

SPLIT-type B split

A type B split is done in an office in which a DMS-100 switch is homed to a DMS-200 switch. In this configuration, the DMS-100 switch serves two or more different NPAs after the split. Part of the office retains the original NPA, while the remainder uses a new NPA. The DMS-100 switch remains homed to the same DMS-200 switch.

REHOME-type C split

A type C split is done in an office in which a DMS-100 switch is homed to a DMS-200 switch. In this configuration, the DMS-100 switch is completely rehomed to a different DMS-200 switch. The type C split also exchanges the original NPA for the new NPA being introduced by the split. This type of NPA

split requires changing the trunks from the original home DMS-200 switch to the new home DMS-200 switch. The DMS-100 switch may require resynchronization to the new DMS-200 switch.

DMS-100/200 switch-type D split

A type D split is done in an office that has a DMS-100/200 switch. In this configuration, the DMS-100/200 switch has an additional NPA or a new NPA after the split. The split is done one of the following ways: the original NPA is split and a new NPA is added, as in the type B split, or the original NPA split is exchanged for a new NPA, as in the type A split.

DMS-200 switch SPLIT-type E split

The type E split is done in an office that has a DMS-200 switch. In this configuration, the DMS-200 switch has two or more NPAs. This is typically a tandem office. This type of office is updated as the surrounding DMS-100 switch activities occur.

Dialing pattern

The dialing plan of the office after the split must be researched for the following information:

- How do operating company subscribers dial or connect to the new NPA after the split?
- Will there be a period of permissive dialing?
- What level of permissive dialing will occur?
- Will there be announcements that tell the correct dialing sequence?

Permissive dialing is a period during which a caller can dial inter-NPA calls by dialing seven digits. During this period, the call will either be allowed, routed to an announcement, or routed to an announcement and allowed to complete. The callers will become familiar with the new NPA, local calling areas, and dialing patterns. These calls can be billed or allowed as free calls during the permissive dialing period. The regional engineer works with the operating company to determine the dialing plan for the office and the most feasible method for achieving the required dial plan.

Translations table flow

This section describes the datafill for the various types of activity involved in an NPA split.

Type A NPA split

The type A split swaps the original NPA for a new NPA.

NPA splits (continued)

In the type A NPA split, the dialing patterns remain similar for the stations off the end office. The only changes are those made by the operating company to change screening, trunking, or routing information.

The following tables require changes:

- HNPACONT.HNPACODE

  Table HNPACONT and subtable HNPACONT.HNPACODE are changed to route the new NPA. The entry for the old NPA is rerouted. The new NPA has to be broken out to allow or disallow dialing of the home NPA.

- CLSVSCRC.CLSVSCR

  If class of service screening is used, some call types have to be rerouted using table CLSVSCRC and subtable CLSVSCRC.CLSVSCR.

- LATAXLA

  For EA offices, there must be an entry for the new NPA NXX combinations that do not route to the default treatment. Entries for the old NPA NXX combinations are deleted.

Type B NPA split

The type B NPA split splits the office so that part of the office remains in the original NPA while the balance of the office has a new NPA assigned to it.

Since part of the office remains in the original NPA, some of the NPA instances are not altered. Part of the routing remains as it was prior to the split, while other route elements are altered or added.

Additional data is built to provide screening, routing, and trunking modifications. With this type of split, the office has two sets of translations, one for the original NPA and one for the new NPA.

The following tables or subtables require modifications or additional data:

- LINEATTR

  Table LINEATTR (line attribute) requires additional entries to accommodate the new NPA as well as any new local calling area names, standard pretranslators, message rate names, class of service screening, or LATA names.

- STDPRTCT.STDPRT

  If new line attributes are built, new standard pretranslators can be used as well. If so, entries are required in the control and subtable to define the dialing patterns for each translator.

- LCASCRCN.LCASCR

NPA splits (continued)

There are entries in subtable LCASCRN.LCASCR (local calling area screening control) to identify the local calling area (LCA) names associated with the new NPA.

All the local NNX codes available in the new NPA are listed in table LCASCR for the new NPA. Some NNX combinations in the original NPA care not valid as local calls after the NPA split.

- PFXTREAT

  Table PFXTREAT (prefix treatment) can require changed or additional entries. The operating company and the regional engineer can determine any new prefix selectors or calltype updating that is required to allow the permissive dialing period.

- LATAXLA

  The new NPA NXX codes require entries in table LATAXLA to ensure proper intra LATA, intra state coding for equal access.

- HNPACONT.HNPACODE

  To provide for the new NPA, a new HNPACONT entry is required. New entries in HNPACODE and RTEREF subtables are also required. The operating company advises the regional engineer of these new entries or builds the tables prior to sending in the test image.

  The original NPA remains in the HNPACONT table. The routing for the original HNPACONT.HNPACODE and HNPACONT.RTEREF table does not change. Customers with the original NPA do not have major changes in their dialing plans. Customers in the new NPA do have changes. These changes are handled through routing during the permissive dialing period. The operating company advises the regional engineer of any changes to these tables.

- OFRT

  Table OFRT (office route) needs to be updated to accommodate additional routing requirements of the new NPA. The changes include additions to the table or reassigning route lists to new route numbers. The changes occur when the operating company adds new trunk groups and if additional routes are required to route the traffic for the new NPA.

  For each instance of the RT selector, the digits to be inserted must be looked at to determine if they will reside in the new NPA. If so, the NPA field must be changed to reflect this.

- DNROUTE

NPA splits (continued)

In the directory number route table, the area code, office code, and station code must be detailed for the new NPAs.

- TRKGRP

  Each trunk group that resides in the new NPA must have the SNPA field set to the new NPA value. For incoming TI trunk groups, the incoming side has to have the connecting NPA set to the appropriate value.

The following tables may require modifications or additional data, depending on the operating company requirements:

- CLSVSCRC.CLSVSCR

  Subtable CLSVSCRC.CLSVSCR (class of screening) can require entries if the operating company wants to block calls or send certain calls to an announcement. This table can require entries to accommodate the permissive dialing period. After the split, there can be entries in table CLSVSCRC.CLSVSCR that need to be altered or deleted.

- MRSANAME, MUMRMBI, MUMRTAB, CHARGETAB

  The Multi-unit Message Rate tables need to be altered if the operating company is using MUMR to bill certain calls. The MUMR NAME, associated indexes, and schedules are updated if the operating company is adding additional MRSA NAMES in table LINEATTR. If the operating company eliminates LINEATTR indexes that reference a MRSA NAME, the MUMR tables are updated.

- FNPACONT.FNPACODE, RTEREF

  Subtables FNPACONT.FNPACODE, RTEREF should be dealt with similarly to the HNPA tables.

  Each of the codes that require six digit translation in the new NPA is built before the test or frozen image is sent in. When accessing table FNPACODE, ensure that field CAMMAUTH is set to YES if 1 + calls are billable.

- TOFCNAME

  A terminating office (TOFC) is a combination of area code and office code. The area code must be defined in table HNPACONT or SNPANAME.

Type C NPA split

The type C NPA split requires a combination of swapping the NPA and rehoming the DMS-100 switch to another DMS-200 switch.

This type of NPA split can be considered to be a type A split with the addition of rehoming the office. Routing requirements to accommodate the trunks connected to the new DMS-200 switch as well as miscellaneous routing

changes, should be built before the test image is received. The changes include CLLI names, trunking tables, and the routing to access these tables.

The home DMS-200 switch must be capable of handling the new traffic before the night of the NPA split. This includes having both hardware and translations in place.

After the physical rewiring of the trunks from the old tandem to the new tandem is done and the new trunks have been tested and placed in service, the routing and trunking used to home in the previous office are deleted.

Type D NPA split

The type D NPA split involves the introduction of a new NPA into a DMS-100/200 office. This activity involves a type A or B NPA split with the addition of the tandem features of a DMS-200 switch. Data concerns are similar to the SWAP or the SPLIT methods with additional information required for trunking.

If the office involved is of the type A split, then all trunks in the office require the NPA to be changed. If the office emulates the type B activity, then the operating company must detail which trunks will be affected by the NPA split.

In addition to the data tables described in previous sections for NPA split types A and B, the following tables may have to be altered to accomplish the NPA split:

- BILLCODE

  The NPA fields in table BILLCODE are changed for appropriate SC trunk groups.

- ARMCAT

  If the office has incoming trunks from a North Electric AMR5 switch (SC or A5 trunks from the AMR5 office), the NPA field is changed to the new NPA.

- INWORIBN

  If the office is configured for INWATS service, field NPASAC in table INWORIBN is changed or the new NPA is added to the table. This table requires operating company datafill to provide for the new codes.

- INWTERTE

  If table INWTERTE (INWATS terminating route reference) is in the load, and the RT (retranslate) selector is being used, field SNPA must be changed for the new NPA.

- INWSNPA

NPA splits (continued)

In a common channel signaling 6 (CCIS6) office, table INWSNPA (INWATS originating screening) provides the mapping between the NPA and the SAC codes. The operating company identifies which codes are altered for input to this table.

- DNPIC

  Table DNPIC (directory number primary inter LATA carrier) is changed for the directory numbers (DN) that have a new NPA associated with them.

- CARRTRE

  The Carrier Tariff table will need to be changed for each instance of a Carrier name that is associated with an NPA that should be changed.

- TERMNPA

  Table TERMNPA (TOPS terminating NPA) allows the datafill of those NPA NXX combinations that will be dialed as local calls from the recently split office. There can be additions or alterations to this table based on operating company input, so that the correct NPA will appear on AMA.

Type E NPA split

The type E NPA split involves a tandem office that has more NPAs than before the split.

A type E NPA split requires setting up nearly parallel translations for each NPA that is introduced.

This type of NPA split requires periodic updating by the operating company during the period when surrounding offices are being switched to the new NPAs. Changes are made to trunking and routing tables to accommodate the split and provide proper billing. The operating company updates the trunking and routing tables as the associated end offices switch to the new NPAs.

The regional engineer assists the operating company in determining which trunk groups and routes require changing. Each of the trunk groups in the switch needs to be evaluated as to whether a given trunk requires the NPA to be changed during the initial NPA split process.

The operating company provides the regional engineer with information regarding the reassignment of the original groups of trunks, as well as the routing that is required to access them.

The operating company also provides the regional engineer with the HNPACONT.HNPACODE subtable entries, or datafills the code table before the test image is sent.

For IT trunk types, the Connecting NPA field should be analyzed to determine the proper entry.

See the type D NPA split section for details on other table entries to be aware of.

Major feature groups

This section describes the NPA split changes in the MDC environment.

Meridian Digital Centrex

Changes made in the MDC environment will be fairly straight forward. The majority of the changes are to the NPA fields in the various tables. Routing changes or dialing pattern changes are taken care of by the operating company or relayed to the regional engineer prior to the shipment of the test or frozen image

Tables that require additional changes include the following:

- VIRTGRPS

  In table VIRTGRPS (virtual facility group), there are entries to route based on a specific line attribute index. The referenced line attribute index, if no longer valid, must be changed to one that will route and screen according to operating company-defined plans.

  Field BILLNUM should be investigated because, depending on the type of NPA split, the billing DN is not valid after the split.

- IBNXLA

  Ensure that selectors in table IBNXLA that point to other tables still route correctly.

  Selectors such as the NET, OUTWATS, or DOD route to table LINEATTR. The regional engineer ensures that the line attribute has not been deleted and that the selector has not been rerouted to another index.

  Review all NPA instances to determine if the NPA requires changing.

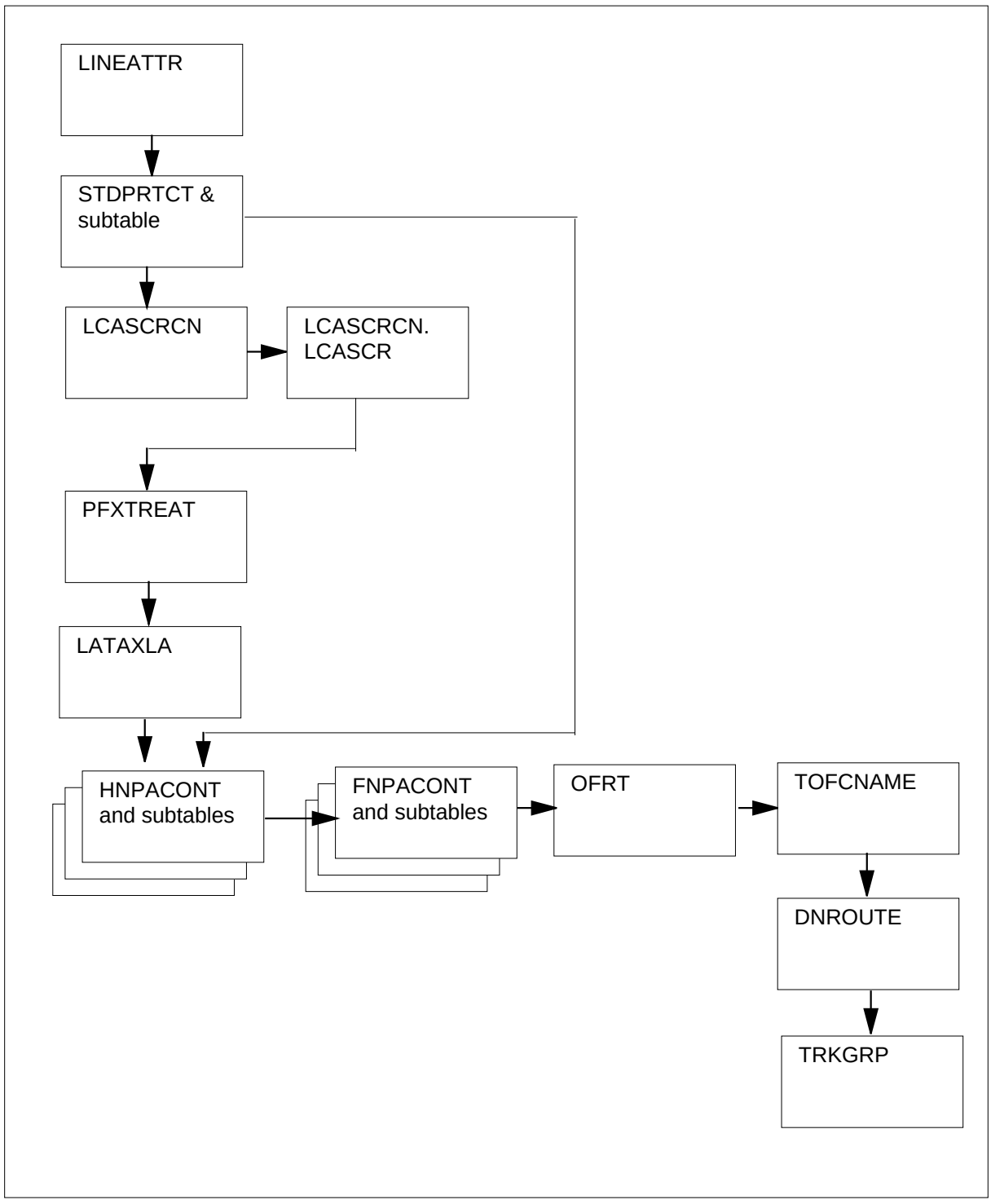
- TRKGRP (Group Types IBNTI, IBNTO, IBNT2)

  Review the entries in table TRKGRP for group types IBNTI, IBNTO, and IBNT2 to determine if the NPA is valid after the NPA split.

The NPA splits type B translation process is shown in the flowchart that follows.

NPA splits (continued)

Table flow for type B NPA splits



NPA splits (continued)

The following table lists the datafill content used in the flowchart.

In the examples, the NPA 919 is being split into two NPAs: 919 and 920. The example data show the translations before and after the NPA split.

Datafill example for type B NPA splits

Datafill table	Example data
LINEATTR	10 1FR NONE NT NSCR 0 919 RALDUR LCA1 NONE N 10 NIL NIL 00 N
STDPRTCT	RALDUR 0 0
STDPRTCT. STDPRT	12 115 S DD O CPHLCARY 2 4 NONE
LCASCRCN	919 LCA1 MAND N
LCASCRCN. LCASCR	286 286 376 376 596 596
PFXTREAT	MAND DD Y DD UNDT
LATAXLA	A5555 919544 INTER INTER STD
HNPACONT	919 2 10
HNPACONT. HNPACODE	286 286 HRTE 1 919 919 HNPA 0
HNPACONT. RTEREF	1 S D CPHLCARY
OFRT	1 S D CPHLCARY
TOFCNAME	919 596
DNROUTE	919 596 1 S D CPHLCARY
TRKGRP	CPHLCARY T2 10 EML3 NCRT IE MIDL N N RALDUR NSCR 919 LCL N N

NPA splits (continued)

Datafill example for type B NPA splits after the split (Sheet 1 of 2)

Datafill table	Example data
LINEATTR	10 1FR NONE NT NSCR 0 919 RALDUR LCA1 NONE N 10 NIL NIL 00 N 11 1FR NONE NT NSCR 0 920 RALDUR LCA2 NONE N 10 NIL NILSFC B5555 0 NIL NIL 00 N
STDPRTCT	RALDUR 0 0
STDPRTCT. STDPRT	12 115 S DD O CPHLCARY 2 4 NONE 119 140 S DD 0 CPHLCARY 2 4 NONE
LCASCRCN	919 LCA1 MAND N 920 LCA2 MAND N
LCASCRCN. LCASCR	286 286 376 376 596 596 312 312 679 679 742 742
PFXTREAT	MAND DD Y DD UNDT
LATAXLA	A5555 919544 INTER INTER STD B5555 920222 INTER INTER STD
HNPACONT	919 2 10 920 2 20
HNPACONT. HNPACODE	286 286 HRTE 1 919 919 HNPA 0 920 920 HNPA 0 566 566 HRTE 1
HNPACONT. RTEREF	1 S D CPHLCARY 1 S D CPHLCARY1
OFRT	1 S D CPHLCARY 2 S D CPHLCARY1
FNPACONT	704 2 - (6) (0) (2)
FNPACONT. FNPACODE	365 365 1 Y
FNPACONT. RTEREF	1 N D CPHLCARY2 0

Datafill example for type B NPA splits after the split (Sheet 2 of 2)

Datafill table	Example data
TOFCNAME	919 596920 742
DNROUTE	919 596 1 S D CPHLCARY920 742 1 S D CPHLCARY1
TRKGRP	CPHLCARY T2 10 EML3 NCRT IE MIDL N N RALDUR NSCR 919 LCL N N CPHLCARY1 T2 10 EML3 NCRT IE MIDL 2 N N RALDUR NSCR 920 LCL N N CPHLCARY2 T2 10 EML3 NCRT IE MIDL 2 N N RALDUR NSCR 704 LCL N N

Limitations and restrictions

The following restrictions are placed on the NPA split process to ensure integrity and to provide control for each step:

- There can be no software load increment during the process.
- The office must be operating at a supported software load.
- No new software packages can be added to the load.
- Data changes and service order activity are frozen from the time the frozen image is taken to the time of application.
- The journal file must be turned on and kept running from the time the frozen image is received until the application date.
- If the NPA Split includes the addition of hardware, the hardware must be installed and tested before the test image is submitted.
- If network reconfiguration is required, it must be completed before the test image is submitted.

Interactions

NPA splits has no functionality interactions.

Activation/deactivation by the end user

NPA splits requires no activation or deactivation by the end user.

NPA splits (continued)

Billing

The operating company must determine the type of billing to generate for a call between the old and the new NPA. The following information must be determined:

- Will Multi-unit Message Rate service be used to bill these new inter-NPA calls?
- Will these calls be blocked, sent to an announcement, billed as normal 1+ dialing, or allowed as free calls?
  - — When accessing table FNPACODE, ensure that field CAMMAUTH is set to YES if 1 + calls are billable.

Station Message Detail Recording

NPA splits does not affect Station Message Detail Recording.

Datafilling office parameters

The following table shows the office parameters used by NPA splits. For more information about office parameters, refer to *Office Parameters Reference Manual.*

Office parameters used by NPA splits

Table name	Parameter name	Explanation and action
OFCENG	ACTIVE_DN_SYSTEM	If this parameter is set to North American, the area code must be three digits long.

Datafill sequence

The following table lists the tables that require datafill to implement NPA splits. The tables are listed in the order in which they are to be datafilled.

Datafill tables required for type B NPA splits (Sheet 1 of 3)

Table	Purpose of table
LINEATTR	The line attribute index table assigns attributes to regular lines and to Meridian stations and attendant consoles.
STDPRTCT. STDPRT	The list of standard pretranslation tables subtable assigns names for each line attribute if its line class code permits origination of calls.
LCASCRCN	The local calling area screening control table contains subtables that required in a toll or local/toll switching unit for incoming or two-way Traffic Operator Position System (TOPS), Centralized Automatic Message Accounting (CAMA), or AMR5 trunk groups.

NPA splits (continued)

Datafill tables required for type B NPA splits (Sheet 2 of 3)

Table	Purpose of table
LCASCRCN. LCASCR	The local calling area screening subtable determines if a call is a local or non-local termination, depending on the digits dialed. One screening table is required for each local calling area that lies within the territorial boundary of the switching unit.
PFXTREAT	The prefix treatment table determines the call treatment to which a call is routed.
LATAXLA	The Equal Access local access and transport area translation table defines the attributes of domestic calls such as inter-LATA or intra-LATA and interstate or intrastate.
HNPACONT	The home numbering plan area code table and subtables contain information on records of the Home NPA.
HNPACONT. HNPACODE	The home NPA code subtable lists the route, treatment, or table that translation routes to for each of the 1000 three-digit codes (000 to 999) within each of the serving number plan areas (SNPA) or serving translation scheme (STS) assigned in table HNPACONT.
HNPACONT. RTEREF	The home NPA route reference subtable is required for each HNPACONT table.
OFRT	The office route table is used if an originating call is being translated and a preceding stage identifies a route reference index.
FNPACONT	The list of foreign numbering plan area codes subtables table is used for routing calls that require six-digit translations by office, operator or other three-digit codes within an FNPA, excluding inward wide area telephone service (INWATS) serving codes, as an alternative to six-digit translations.
FNPACONT. FNPACODE	The foreign numbering plan area codes subtables table is used for routing calls that require six-digit translations by office, operator or other three-digit codes within an FNPA, excluding inward wide area telephone service (INWATS) serving codes, as an alternative to six-digit translations.
FNPACONT. RTEREF	The list of foreign numbering plan area codes subtables table is used for routing calls that require six-digit translations by office, operator or other three-digit codes within an FNPA, excluding inward wide area telephone service (INWATS) serving codes, as an alternative to six-digit translations.
TOFCNAME	The terminating office name table is used to define all the terminating offices in the switch.

NPA splits (continued)

Datafill tables required for type B NPA splits (Sheet 3 of 3)

Table	Purpose of table
DNROUTE	The directory number route table lists information for writable directory numbers (DN) in the switch.
TRKGRP	The trunk group table contains customer-defined data associated with each trunk group that exists in the switching unit.

Datafilling table LINEATTR

The following table shows the datafill specific to NPA splits for table LINEATTR. Only those fields that apply directly to NPA splits are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table LINEATTR (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
LNATTIDX		0 to 31 999	Line attribute index. Enter the index into table LINEATTR.
STS		numeric (3 digits)	Serving translation scheme. Enter the serving numbering plan area (NPA) assigned to the line attribute index. The STS of an existing tuple cannot be changed.
PRTNM		alphanumeric (up to 4 characters) or NPRT	Standard pretranslator subtable name. If pretranslation of digits is require, enter the name of the standard pretranslator subtable assigned to the line attribute index. Otherwise, enter NPRT.
LCANAME		alphanumeric (up to 5 characters) or NLCA	Local calling area screening subtable name. If screening of local central office codes (NNX) is required, enter the name of the local calling area subtable assigned to the line attribute index. Otherwise, enter NLCA.

Datafilling table LINEATTR (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
MRSA		alphanumeric (up to 8 characters) or NIL	Message rate service area. If the switching unit is equipped to provide multiunit message rate (MUMR) services and the MUMR billing records are required for calls to numbers resulting in a type of call of NP (no prefix), enter a message rate service area (MRSA) name as datafilled in table MRSANAME field MRSA. If MUMR billing records are not required, enter NIL.
LATANM		alphanumeric (up to 8 characters)	Local access and transport area name. Enter the name of the local access and transport area (LATA) assigned to the line attribute index.

Datafill example for table LINEATTR

The following example shows sample datafill for table LINEATTR before the split.

MAP display example for table LINEATTR

```
LNATTIDX  LCC CHGCLSS COST SCRNCL LTG  STS  PRTNM LCANAME
ZEROMPOS  HOT   TRAFSNO  MRSA  SFC   LATANM  MDI  IXNAME
DGCLNAME FANIDIGS RESINFO
_____________________________________________________________
10        1FR  NONE    NT   NSCR   0    919  RALDUR LCA1
NONE      N     10        NIL   NILSFC A5555  0    NIL
NIL       00       N $
```

The following example shows sample datafill for table LINEATTR after the split.

NPA splits (continued)

MAP display example for table LINEATTR

```
LNATTIDX LCC CHGCLSS COST SCRNCL LTG STS  PRTNM   LCANAME
ZEROMPOS HOT  TRAFSNO  MRSA  SFC    LATANM  MDI  IXNAME
DGCLNAME   FANIDIGS   RESINFO
_____________________________________________________________
10      1FR  NONE   NT   NSCR   0   919  RALDUR    LCA1
NONE     N    10       NIL   NILSFC A5555   0     NIL
NIL        00         N $

11    1FR NONE     NT   NSCR  0   920  RALDUR  LCA2
NONE     N    10       NIL   NILSFC B5555   0     NIL
NIL        00         N $
```

Datafilling table STDPRTCT

The following table shows the datafill specific to NPA splits for table STDPRTCT. Only those fields that apply directly to NPA splits are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table STDPRTCT

Field	Subfield or refinement	Entry	Explanation and action
EXTPRTNM		alphanumeric (up to 8 characters)	External standard pretranslator subtable name. Enter the name defined by the operating company to represent the standard pretranslator subtable.

Datafill example for table STDPRTCT

The following example shows sample datafill for table STDPRTCT before and after the split.

MAP display example for table STDPRTCT

```
EXTPRTNM   STDPRT   AMAPRT

_____________________________________________________________________

RALDUR     (  0)    (  0)
```

Datafilling subtable STDPRTCT.STDPRT

The following table shows the datafill specific to NPA splits for subtable STDPRTCT.STDPRT. Only those fields that apply directly to NPA splits are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling subtable STDPRTCT.STDPRT

Field	Subfield or refinement	Entry	Explanation and action
FROMDIGS		numeric (vector of up to 18 digits	From digits. Enter the digit or digits to be translated. If the entry represents a block of consecutive numbers, enter the first number in the block.
TODIGS		numeric (vector of up to 18 digits)	To digits. If field FROMDIGS represents a block of consecutive numbers, enter the last number in the block. Otherwise, the entry is equal to the entry in field FROMDIGS.
PRERTSEL		alphanumeric	Pretranslator route selector. Enter the pretranslator route selector.
Note: Refer to the data schema section of this document for more information on subfields that are dependent on the entry in field PRERTSEL.			

Datafill example for subtable STDPRTCT.STDPRT

The following example shows sample datafill for subtable STDPRTCT.STDPRT before the split. The subtable is positioned on tuple RALDUR.

NPA splits (continued)

MAP display example for subtable STDPRTCT.STDPRT

```
FROMDIGS   TODIGS   PRETRTE
_____________________________________________________________
12         115      S   DD  0  CPHLCARY   2   4   NONE $
```

The following example shows sample datafill for subtable STDPRTCT.STDPRT after the split.

MAP display example for subtable STDPRTCT

```
FROMDIGS   TODIGS   PRETRTE
_____________________________________________________________
12         115       S   DD  0  CPHLCARY   2   4   NONE $
119        140       S   DD  0  CPHLCARY   2   4   NONE $
```

Datafilling table LCASCRCN

The following table shows the datafill specific to NPA splits for table LCASCRCN. Only those fields that apply directly to NPA splits are shown.

For a description of the other fields, refer to the data schema section of this document.

Datafilling table LCASCRCN

Field	Subfield or refinement	Entry	Explanation and action
	STS	numeric	Serving translation scheme. Enter a serving NPA code for the trunk group.
	LCANAME	alphanumeric (up to 4 characters)	Local calling area name. Enter the name of the subtable LCASCRCN.LCASCR. Entry NLCA is not allowed in table LCASCRCN because it is reserved by DMS switch software to mean no local calling area screening. An accidental addition of NLCA in table LCASCRCN followed by deletion removes NLCA from tables such as LINEATTR field LCANAME, making the specification of no local calling area screening impossible.
PFXSELEC		MAND, OPTL or alphabetic (up to 4 characters)	Prefix selector. Enter the name of the prefix selector that is assigned to the LCASCRCN.LCASCR subtable.

Datafill example for table LCASCRCN

The following example shows sample datafill for table LCASCRCN before the split.

MAP display example for table LCASCRCN

```
NPALOCNM   LCASCR PFXSELEC PFXFOR10

_____________________________________________________________________

919         LCA1   MAND      N
```

The following example shows sample datafill for table LCASCRCN after the split.

NPA splits (continued)

MAP display example for table LCASCRCN

```
NPALOCNM   LCASCR PFXSELEC PFXFOR10

_____________________________________________________________________
919         LCA1   MAND      N
920         LCA2   MAND      N
```

Datafilling subtable LCASCRCN.LCASCR

The following table shows the datafill specific to NPA splits for subtable LCASCRCN.LCASCR. Only those fields that apply directly to NPA splits are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling subtable LCASCRCN.LCASCR

Field	Subfield or refinement	Entry	Explanation and action
FROMDIGS		000 to 999	From digits. Enter the three-digit local NNX code. This number represents a single code, or the first in a block of consecutive local NNX codes.
TODIGS		000 to 999	To digits. If field FROMDIGS represents the first number of a block of consecutive local NNX codes, enter the last NNX code in the block. If field FROMDIGS represents a single local NNX code, enter the NNX code entered in FROMDIGS.

Datafill example for subtable LCASCRCN.LCASCR

The following example shows sample datafill for subtable LCASCRCN.LCASCR before the split. The subtable is positioned on tuple 919 LCA1.

NPA splits (continued)

MAP display example for subtable LCASCRCN.LCASCR

```
FROMDIGS   TODIGS
_____________________________________________________________________
286        286
376        376
596        596
```

The following example shows sample datafill for subtable LCASCRCN.LCASCR after the split.

In this example, the subtable is positioned on tuple 920 LCA2.

MAP display example for subtable LCASCRCN.LCASCR

```
FROMDIGS   TODIGS
_____________________________________________________________________
312        312
679        679
742        742
```

NPA splits (continued)

Datafilling table PFXTREAT

The following table shows the datafill specific to NPA splits for table PFXTREAT. Only those fields that apply directly to NPA splits are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table PFXTREAT

Field	Subfield or refinement	Entry	Explanation and action
TYPLCLCD		see subfields	Type of call and local code. This field consists of subfields PFXSELEC, TYPCALL, and LOCAL.
	PFXSELEC	OPTL, MAND or alphanumeric (up to 4 characters)	Prefix selector. Enter the prefix selector assigned to the prefix treatment.
	TYPCALL	DD, OA, NP, or NL	Type of call. Enter the type of call, DD (direct dial), OA (operator assisted), NP (no prefix), or NL (nil). For Traffic Operator Position System (TOPS) calls, there can be a mixture of 0 and 1 (OA and DD) call types. Enter NL for these cases.
	LOCCODE	Y or N	Local code. If the record is for a local call, enter Y (yes).
UPDTYPCA		DD, OA, NP or NL	Updated type of call. If the type of call is updated, enter the updated type of call: DD (direct dial), NP, OA (operator assisted), NP (no prefix), or NL (nil). If type of call is not updated, enter the value assigned to field TYPCALL. For Traffic Operator Position System (TOPS) calls, there can be a mixture of 0 and 1 (OA and DD) call types. Enter NL for these cases.
TREAT		alphanumeric (4 characters)	Treatment. If calls that route to the prefix treatment are allowed to complete, enter UNDT (undefined treatment) as the treatment. If calls which route to the prefix treatment are not allowed to complete, enter the treatment name that is assigned in the treatment table to which the call is terminated.

Datafill example for table PFXTREAT

The following example shows sample datafill for table PFXTREAT before and after the split.

MAP display example for table PFXTREAT

```
TYPLCLCD        UPDTYPCA   TREAT

_____________________________________________________________________

MAND   DD   Y     DD         UNDT
```

Datafilling table LATAXLA

The following table shows the datafill specific to NPA splits for table LATAXLA. Only those fields that apply directly to NPA splits are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table LATAXLA (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
LATACODE		see subfield	LATA code. This field is the key into table LATAXLA and consists of subfields LATANM and DIGITS.
	LATANAME	alphanumeric (up to 16 characters)	Calling LATA name. Enter the LATA name as defined in table LATANAME.
	DIGITS	numeric (up to 18 digits)	Dialed digits. Enter the digits (NPA or NPANXX) dialed by the originator of the call. Enter only those digits for which one of the following sets of attributes applies: • intra-LATA, interstate • inter-LATA, interstate • inter-LATA, intrastate

NPA splits (continued)

Datafilling table LATAXLA (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
LATA		INTER or INTRA	LATA call attribute. Enter INTER or INTRA to define an NPA or NPANXX code as either inter-LATA or intra-LATA.
STATE		INTER or INTRA	State call attribute. Enter INTER or INTRA to define an NPA or NPANXX code as either interstate or intrastate.

Datafill example for table LATAXLA

The following example shows sample datafill for table LATAXLA before the split.

MAP display example for table LATAXLA

```
LATACODE            LATA STATE    EATYPE

_____________________________________________________________________
A5555     919544    INTER INTER   STD
```

The following example shows sample datafill for table LATAXLA after the split.

MAP display example for table LATAXLA

```
LATACODE            LATA STATE    EATYPE

_____________________________________________________________________
A5555     919544    INTER INTER   STD
B5555     920222    INTER INTER   STD
```

Datafilling table HNPACONT

The following table shows the datafill specific to NPA splits for table HNPACONT. Only those fields that apply directly to NPA splits are shown.

For a description of the other fields, refer to the data schema section of this document.

Datafilling table HNPACONT

Field	Subfield or refinement	Entry	Explanation and action
STS		0 to 9 999 999 (1 to 7 digits)	Serving translation scheme. Enter a serving numbering plan area (SNPA) or serving translation scheme (STS) code.
NORTREFS		1 to 1023	Number of route references. Enter 2 for the quantity of route reference numbers. Field NORTREFS is automatically extended to the highest route index used in subtable HNPACONT.RTEREF.
NOAMBIGC		0 to 1000	Number of ambiguous codes. Enter the number of ambiguous codes required.

Datafill example for table HNPACONT

The following example shows sample datafill for table HNPACONT before the split.

MAP display example for table HNPACONT

```
STS NORTREFS NOAMBIGC  RTEREF HNPACODE  ATTRIB  RTEMAP

_____________________________________________________________________
919 2        10
```

The following example shows sample datafill for table HNPACONT after the split.

NPA splits (continued)

MAP display example for table HPNACONT

```
STS NORTREFS NOAMBIGC  RTEREF HNPACODE  ATTRIB  RTEMAP

_____________________________________________________________________
919 2        10
920 2        20
```

Datafilling subtable HNPACONT.HNPACODE

The following table shows the datafill specific to NPA splits for subtable HNPACONT.HNPACODE. Only those fields that apply directly to NPA splits are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling subtable HNPACONT.HNPACODE (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
FROMDIGS		numeric (3 digits)	From digits. Enter the ambiguous number. This number represents either a single code or the first in a block of consecutive codes that have the same input data.
TODIGS		numeric (3 digits)	To digits. If field FROMDIGS represents a single code, enter the same single code as in field FROMDIGS. If field FROMDIGS represents the first number of a block of consecutive numbers, enter the last number in the block.

Datafilling subtable HNPACONT.HNPACODE (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	CD	HNPA or HRTE	Code type. Enter HNPA if it is permissible to dial HNPA and datafill refinement RR. Enter HRTE for the HNPA route and datafill refinement RR.
	RR	0 or 1 or 1 to 1023	Route reference index. If the entry in field CD is HNPA, enter 0 (zero) if this subfield is not required or enter 1 to strip off the foreign numbering plan area (FNPA) digits on a 10-digit intra-office calls terminating on a trunk to achieve uniform 7-digit outpulsing. If the entry in field CD is HRTE, enter the route reference index of the route list in subtable HNPACONT.RTEREF (at the same position service numbering plan area (SNPA) as this subtable) that translation proceeds to.

Datafill example for subtable HNPACONT.HNPACODE

The following example shows sample datafill for subtable HNPACONT.HNPACODE before the split, the subtable is positioned on tuple 919.

MAP display example for subtable HNPACONT.HNPACODE

```
FROMDIGS   TODIGS   CDRRTMT
_____________________________________________________________
286        286      HRTE  1  $
919        919      HNPA  0  $
```

The following example shows sample datafill for subtable HNPACONT.HNPACODE after the split, the subtable is positioned on tuple 920.

NPA splits (continued)

MAP display example for subtable HNPACONT.HNPACODE

```
FROMDIGS   TODIGS   CDRRTMT
_____________________________________________________________
920        920      HNPA  0  $
566        566      HRTE  1  $
```

Datafilling subtable HNPACONT.RTEREF

The following table shows the datafill specific to NPA splits for subtable HNPACONT.RTEREF. Only those fields that apply directly to NPA splits are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling subtable HNPACONT.RTEREF

Field	Subfield or refinement	Entry	Explanation and action
	CLLI	alphanumeric (1 to 16 characters)	Common language location identifier. Enter the code in table CLLI to which translation is routed.

Datafill example for subtable HNPACONT.RTEREF

The following example shows sample datafill for subtable HNPACONT.RTEREF before and after the split.

In this example, the subtable is positioned on tuple 919.

MAP display example for subtable HNPACONT.RTEREF

```
RTE   RTELIST
_____________________________________________________________
1     S        D          CPHLCARY
```

In this example, the subtable is positioned on tuple 920.

MAP display example for subtable HNPACONT.RTEREF

```
RTE   RTELIST
_____________________________________________________________________
1     S        D          CPHLCARY
1     S        D          CPHLCARY1
```

Datafilling table OFRT

The following table shows the datafill specific to NPA splits for table OFRT. Only those fields that apply directly to NPA splits are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table OFRT (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
RTELIST		see subfield	Route list. This field consists of subfield RTESEL and refinements CONNTYPE and CLLI and ROUTATTR_INDEX.
	RTESEL	CND, DCRT, DN, INS, ISA, MEM, MN, N, N2, NIL, NODE, NODE, NPOS, NPOSDN, NQ, QH, RT, RS, S, SX, T, TC, TRMT or TS	Route selector. Enter the route selector required. Refer to the data schema section of this document for more information on route selectors.
	CONNTYPE	D	Connection type. This field is not used by system logic. Enter D to satisfy table control. An entry outside of this range is invalid.

NPA splits (continued)

Datafilling table OFRT (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
	CLLI	alphanumeric (1 to 16 characters)	Common language location identifier. Enter the code in table CLLI to which translation is routed.
	ROUTATTR_INDEX	alphanumeric (1 to 16 characters)	Route attribute index. If the route selector is SX, enter the index in table ROUTATTR containing the expanded routing information to be applied to the call.

Datafill example for table OFRT

The following example shows sample datafill for table OFRT before the split.

MAP display example for table OFRT

```
RTE   RTELIST

_____________________________________________________________________
1     S        D          CPHLCARY  $
```

The following example shows sample datafill for table OFRT after the split.

MAP display example for table OFRT

```
RTE   RTELIST

_____________________________________________________________________
1     S        D          CPHLCARY  $
2     S        D          CPHLCARY1 $
```

Datafilling table FNPACONT

The following table shows the datafill specific to NPA splits for table FNPACONT. Only those fields that apply directly to NPA splits are shown.

For a description of the other fields, refer to the data schema section of this document.

Datafilling table FNPACONT

Field	Subfield or refinement	Entry	Explanation and action
NPA		numeric	Numbering plan area. Enter the three-digit FNPA code that requires six-digit translation.
MAXRTE		2 to 1023	Number of route references. Enter 2 for the quantity of route reference numbers if the entry in subfield FRTSEL is N.
	FRTSEL	alphanumeric	Foreign NPA route selector. Enter the FNPA route selector. ***Note:*** Refer to the data schema section of this document for more information on subfields that are dependent on the entry in field FRTSEL.

Datafill example for table FNPACONT

The following example shows sample datafill for table FNPACONT after the split.

MAP display example for table FNPACONT

```
NPA    MAXRTE    ROUTES     FNPACODE   FNPASTS     RTEREF
_____________________________________________________________
704    2           –          (    6)   (    0)   (    2)
```

NPA splits (continued)

Datafilling subtable FNPACONT.RTEREF

The following table shows the datafill specific to NPA splits for subtable FNPACONT.RTEREF. Only those fields that apply directly to NPA splits are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table FNPACONT.RTEREF

Field	Subfield or refinement	Entry	Explanation and action
RTELIST		see subfield	Route list. This field consists of subfield RTESEL and refinements CONNTYPE and CLLI.
	RTESEL	CND, DCRT, DN, INS, ISA, MEM, MN, N, N2, NIL, NODE, NODE, NPOS, NPOSDN, NQ, QH, RT, RS, S, SX, T, TC, TRMT or TS	Route selector. Enter the route selector. Refer to the data schema section of this document for more information on route selectors.
	CONNTYPE	D	Connection type. This field is not used by system logic. Enter D to satisfy table control. An entry outside of this range is invalid.
	CLLI	alphanumeric (1 to 16 characters)	Common language location identifier. Enter the code in table CLLI to which translation is routed.
	ROUTATTR_ INDEX	alphanumeric (1 to 16 characters)	Route attribute index. If the route selector is SX, enter the index in table ROUTATTR containing the expanded routing information to be applied to the call.

Datafill example for table FNPACONT.RTEREF

The following example shows sample datafill for table FNPACONT.RTEREF after the split.

In this example, the subtable is positioned on tuple 704.

NPA splits (continued)

MAP display example for table FNPACONT.RTEREF

```
RTE             RTELIST
_____________________________________________________________
1               N       D       CPHLCARY2  0
```

NPA splits (continued)

Datafilling table TOFCNAME

The following table shows the datafill specific to NPA splits for table TOFCNAME. Only those fields that apply directly to NPA splits are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table TOFCNAME

Field	Subfield or refinement	Entry	Explanation and action
AREACODE		0 to 9 999 999 (vector of up to 7 digits)	Area code. The area code identifies a major geographical area served by the switch. This field can contain one to seven digits. In a North American office, the area code must be three digits in length. Enter an area code that has been defined in table SNPANAME or table HNPACONT.
OFCCODE		0 to 9 999 999 (vector of up to 7 digits) or $	Office code. The office code is a subregion of the area code. It can have zero to seven digits. In a North American office, the office code must be three digits in length. Enter $ for smaller countries if the office parameter is UNIVERSAL. Enter a number that has not been used as an area code. For example, if an area code is 613, then the office code cannot be 613. Do not have the same office code in two different area codes (for example, 613 849 and 819 849). Ambiguity is not permitted between fields AREACODE and OFCCODE. One tuple must not be a superset or subset of another. For example, if 200 34 is a valid tuple, then tuples 20 03, 2003 45 or 20 034 cannot be added to the table.

Datafill example for table TOFCNAME

The following example shows sample datafill for table TOFCNAME before the split.

MAP display example for table TOFCNAME

```
AREACODE  OFCODE
-------------------------------------------------------------------------------

919       596
```

The following example shows sample datafill for table TOFCNAME after the split.

MAP display example for table TOFCNAME

```
AREACODE  OFCODE
-------------------------------------------------------------------------------
919       596
920       742
```

Datafilling table DNROUTE

The following table shows the datafill specific to NPA splits for table DNROUTE. Only those fields that apply directly to NPA splits are shown. For

NPA splits (continued)

a description of the other fields, refer to the data schema section of this document.

Datafilling table DNROUTE

Field	Subfield or refinement	Entry	Explanation and action
AREACODE		0 to 9 999 999 (1 to 7 digits)	Area code. The area code identifies a major geographical area served by the switch. If office parameter ACTIVE_DN_SYSTEM in table OFCENG is set to North American, the area code must be three digits long.
OFCCODE		0 to 9 999 999 (0 to 7 digits)	Office code digit register. The office code is a subregion of the area code. If office parameter ACTIVE_DN_SYSTEM is set to North American, the area code must be three digits in length. The office code must be specified in table TOFCNAME. Tuples can be added if the value of field OFCCODE is $ as specified in table TOFCNAME. They cannot contain station codes whose leading digits are an office code in the same area code.
STNCODE		0 to 99999999 (up to 8 digits)	Station code. The station code identifies a unique station within the terminating office (TOFC). If office parameter ACTIVE_DN_SYSTEM is set to North American, the area code must be one of four digits in length. If one digit is entered, it is treated as a D-digit, where the D-digit represents the fourth digit in the format ABC-DEFG.

Datafill example for table DNROUTE

The following example shows sample datafill for table DNROUTE before the split.

MAP display example for table DNROUTE

```
AREACODE  OFFCODE    STNCODE                    DNRESULT
_____________________________________________________________
919       596        1                          S CPHLCARY
```

The following example shows sample datafill for table DNROUTE after the split.

MAP display example for table DNROUTE

```
AREACODE  OFFCODE    STNCODE                    DNRESULT
_____________________________________________________________
919       596        1                          S CPHLCARY
920       742        1                          S CPHLCARY1
```

Datafilling table TRKGRP

The following table shows the datafill specific to NPA splits for table TRKGRP. Only those fields that apply directly to NPA splits are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table TRKGRP (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
GRPKEY		see subfield	Group key. This field consists of subfield CLLI.
	CLLI	alphanumeric (1 to 16 characters)	Common language location identifier. Enter the common language location identifier (CLLI) code assigned to the trunk group in table CLLI.

NPA splits (continued)

Datafilling table TRKGRP (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
GRPINFO		see subfields	Variable group data. This field consists of subfields GRPTYP, TRAFSNO, PADGRP, NCCLS, NCATDIGS, NPACHK, ANITYPE, HOLDTYPE, CONTMARK, SIGFMT, TRAFTYPE, TRAFCLS, SELSEQ, V2DATA, and OPTIONS. Refer to table TRKGRP in the data schema section of this document for information concerning an alternate structure for this field that results from the datafill of table CUSTFLDS.
	GRPTYP	T2	Group type. Enter T2 to specify the trunk group type.

Datafill example for table TRKGRP

The following example shows sample datafill for table TRKGRP before the split.

MAP display example for table TRKGRP

```
GRPKEY     GRPINFO

_____________________________________________________________________
CPHLCARY   T2  10  EML3   NCRT    IE   MIDL N  N  RALDUR
NSCR 919 LCL N N
```

The following example shows sample datafill for table TRKGRP after the split.

MAP display example for table TRKGRP

```
GRPKEY      GRPINFO
_____________________________________________________________
CPHLCARY    T2  10   EML3  NCRT   IE   MIDL 2   N  N
RALDUR NSCR  919   LCL   N  N
CPHLCARY1   T2  10   EML3  NCRT   IE   MIDL 2   N  N
RALDUR NSCR  920   LCL   N  N
CPHLCARY2   T2  10   EML3  NCRT   IE   MIDL 2   N  N
RALDUR NSCR  704   LCL   N  N
```

Translation verification tools

NPA splits does not use translation verification tools.

SERVORD

NPA splits does not use SERVORD.

3 Datafilling Trunk Signaling

The following chapter describes the Trunk Signaling, SS700001, functionality.

Automatic Congestion Control (ACC)

Ordering codes

Functional group ordering code: ISP70001

Functionality ordering code: ISP70003

Release applicability

NA008 and up

Prerequisites

All the datafill information for this particular functionality is included in this document.

Description

Automatic Congestion Control (ACC) maximizes call completions by dynamically regulating traffic in the network to levels that can be handled most efficiently.

Dynamic overload control (DOC) is a network management system that handles heavy traffic during overload conditions. The congested switch alerts connecting switches of the varying levels of congestion by transmitting congestion level signals through Common Channel Signaling System #7 (CCS7).

When a switch becomes congested, all connecting switches are notified of the congestion through CCS7 messages. The distributed data manager (DDM) is used to send the congestion status message to all digital trunk controllers for SS7 trunks (DTC7) on the switch. This congestion status message is used to tell the digital trunk controller (DTC) when the computing module (CM) is congested. The congestion status message can have the values CL0, CL1 and CL2, where CL0 means uncongested. The congestion status message is only sent to DTC7s at return to service (RTS) time or on a change of state of congestion in the CM, for example, from uncongested to CL1 to CL2 to CL1 and back to uncongested.

Operation

Background

ACC enhances DOC on the DMS-100 switch. The two terms DOC and ACC are used interchangeably. DOC is a network management (NWM) function that already exists in the DMS family of switches. DOC is used to handle traffic during overload conditions. The congested DMS-100 switch alerts connecting switches of the varying levels of congestion by transmitting automatic congestion level (ACL1 and ACL2) signals on CCS7 trunks. These

signals prompt the connected switches to apply trunk group controls to reduce traffic to the congested switch. There are two DOC components that exist for the DMS family of switches:

- Internal DOC (IDOC) is used to inform connecting switches when congestion is detected within the switch.
- Remote DOC (RDOC) is a response to a signal from another switch initiated by applying or removing trunk group controls from the switch. RDOC is referred to as preplanned control (PPLN) by network management.

There are three levels of IDOC signals indicating three load threshold levels on the switch. These threshold values are set in table NWMIDOC (Network Management Internal Dynamic Overload Control) for each congestion level. The terms CL1 (Congestion Level 1), CL2, and CL3, MC1 (Machine Congestion 1), MC2, and MC3, and ACL1 (Automatic Congestion Level 1), ACL2, and ACL3, are used interchangeably.

- CL1 is triggered when CPU occupancy exceeds the first critical threshold.
- CL2 is triggered when CPU occupancy exceeds the second more critical threshold.
- CL3 is triggered by a dead system (which includes restarts). This feature will not support the third level of congestion.

Network management

The following gives a short description of existing network management software with references to the relevant documentation. NWM includes the supervision and control of telephone switching networks to ensure the maximum flow of traffic under adverse or overload conditions. Overload conditions occur when the request for service from the switching office exceeds the ability of its trunk groups and common control equipment to provide satisfactory service.

ACC uses existing NWM table control, which involves the use of the following tables:

- Table NWMPPLN (Network Management Preplan Control) lists the maximum number of trunk group controls that can be assigned to each preplan in the table. Table NWMPPLN also specifies whether the preplan can be referenced by entries in table CCS7PPLN which will always be the case for this feature.
- Table CCS7PPLN (Common Channel Signaling System #7 Preplanned Control) contains far-end routeset of the point code which triggers DOC levels 1 and 2. Table CCS7PPLN entries consist of three references to

Automatic Congestion Control (ACC) (continued)

controls stored in table PREPLANS (one reference for each of the three DOC levels).

- Table PREPLANS (Network Management Preplans) contains the short CLLI to which the preplan control applies and the type of control that applies to the preplan. The length of table PREPLANS depends on the values of field NCTRLS in table NWMPPLN.
- Table NWMIDOC (Network Management Internal Dynamic Overload Control) contains the threshold levels for CL1 and CL2, for example, the percentage of CPU occupancy for call processing that triggers CL1 and CL2, as well as the level that turns off CL1 and CL2. Filter times, in minutes, are associated with each set of thresholds. Thresholds specify a time interval before a control is activated and/or deactivated.

When a congestion indication is received on a trunk, different trunk group controls may be activated on a trunk group and/or routeset basis, depending on the level of congestion indicated and the PPLN for that trunk group. PPLN is an automatic control that applies RDOC controls in response to an external signal, in this case a CCS7 message, from a connecting office. The point code of the congested switch is obtained from the entry in table ISUPDEST (ISDN User Part Destination) for the trunk that received the ISDN User Part (ISUP) congestion message. The routeset name associated with the destination point code of the trunk is used to index into table CCS7PPLN to get the appropriate preplan number. The preplan number is used to index into table NWMPPLN and table PREPLANS to get the appropriate congestion controls.

Preplanned controls are activated manually using the AUTOCTRL command from the NWM menu of the MAP terminal. A maximum of 256 preplans, each containing a maximum of 32 trunk group controls, may be activated. CL1 and CL2 are activated manually on the AUTOCNTL level of the MAP terminal. The manual controls override the automatic controls, and CL1 and CL2 may be disabled manually on the AUTOCNTL level of the MAP terminal. If CL1 and CL2 are disabled, automatic congestion changes are inhibited. Table control already exists for setting thresholds for activating and deactivating IDOC levels 1 and 2. (Thresholds for IDOC levels 1 and 2 are defined in table NWMIDOC.) The decision to apply or remove IDOC levels 1 and 2 is made automatically once every minute. The appropriate congestion controls are applied to trunks terminating to the overloaded switch.

When NWM controls have been activated in the office, due to the ACC feature, calls to the congested node will receive the specified NWM response. The NWM response may be rerouting the call or sending the call to treatment. When the call is sent to treatment, the predetermined NWM response will be sent back to the previous office.

Automatic Congestion Control (ACC) (continued)

Congestion detection

The following paragraphs describe how ACC handles the detection of congestion in the CM. When CL1 is reached, the NWM software informs the DTC7s and therefore all adjacent switches need to be informed. The congestion level of the CM is stored in the DTC7s and is accessed for all trunks prior to sending out a release message (RLS). NWM controls are introduced at connected switches as a result of the congestion indication.

The introduction of NWM controls helps to maintain the DMS-100 switch at CL1 until an increased level of traffic is reached. If congestion starts to increase again, the rate of increase should be slower than the rate during normal levels of traffic because NWM controls introduced at connected switches by CL1 are still in operation. However, for greater levels of traffic, congestion increases until CL2 is reached. At this point, CL1 NWM controls are removed and CL2 NWM controls are applied. This causes the CM to inform the DTC7s of the new level of congestion reached and stricter NWM controls are introduced at connected switches. The stricter NWM controls keep the switch at CL2 until a level of traffic is reached where congestion begins to increase again.

However, as traffic messaging is reduced, CL2 is not turned off until a lower level of CPU occupancy is reached so that the switch may have time to recover. Expanded recovery time may be achieved by datafilling table NWMIDOC so that CL2 OFF threshold is lower than the CL1 ON threshold. Below this level the switch is effectively back to CL1. Again, connected switches are informed of the change of state of congestion. NWM controls for CL2 may be taken off, and NWM controls for CL1 may be datafilled. A built-in delay may also be deployed before the controls for CL2 are deactivated and those for CL1 activated. This can be achieved by datafilling the CPU OFF FILTER of table NWMIDOC with a suitable time interval.

Receipt of congestion

ACC accounts for receipt of ACC messages from adjacent exchanges, for example, which NWM controls to apply on a trunk group or routeset basis. Upon receipt of an ACC indication from an adjacent switch, the DTC7 sends the REL message to the CM. The CM obtains the point code of the congested switch from the entry in table ISUPDEST of the trunk that received the message. The routeset name associated with the destination point code of the trunk is used to index into table CCS7PPLN to get the appropriate preplan number which, in turn, is used to index into table PREPLANS to get the appropriate NWM controls to apply to trunks terminating to the overloaded switch. Depending on whether CL1 or CL2 is set, the CM can bring the necessary NWM controls into play for the trunk group and/or routeset in question. The office parameter SS7_CONGESTION_CONTROL_TIME in table OFCENG determines how long the RDOC controls are applied to

Automatic Congestion Control (ACC) (continued)

outgoing trunks to the congested switch. The default value for this office parameter is 5 seconds, with a range extending from 0 to 255 seconds. An arriving ACC message and/or parameter resets the congestion control timer and when this timer expires the RDOC controls are removed. The ACC message and/or parameter is not tandemed to the next switch, but is removed at the first connecting switch.

Translations table flow

The Automatic Congestion Control (ACC) translations tables are described in the following list:

- Table ADJNODE (Adjacent Node) contains information about the type of software running in an adjacent node. ACC adds two new options to table ADJNODE. Option DONSENDACL controls when the ACL parameter is populated in the ISUP REL message in the congested office. Option INHIBITACL is used to block the processing of the ACL parameter on a node level.

  Note: In Gateway offices, option AUTOCON is used in place of DONTSENDACL. This is to maintain current functionality of AUTOCON. Option AUTOCON is set according to existing datafill over one night processes (ONP).

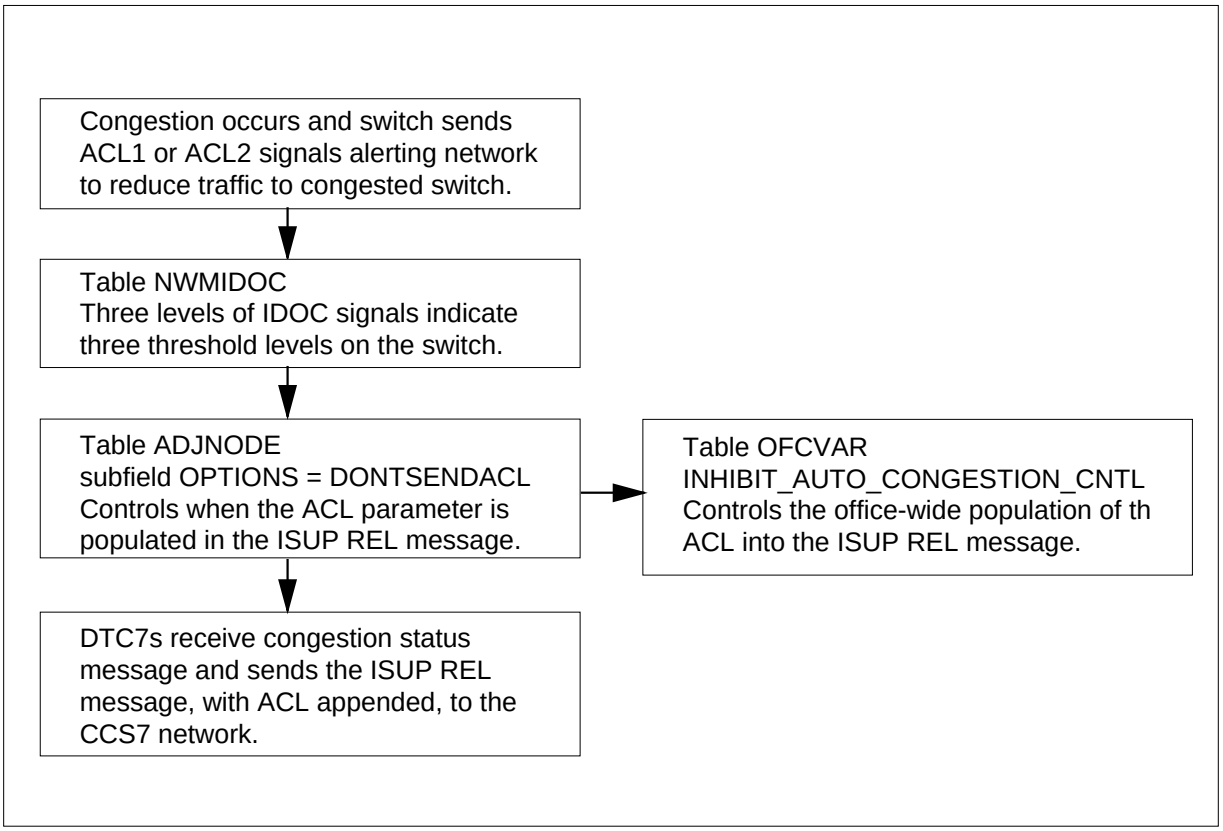
- Table CCS7PPLN (CCS7 Preplan Control) contains the far-end routeset of the point code that triggers DOC levels 1, 2, and 3.
- Table NWMPPLN (Network Management Preplan Control) lists the maximum number of trunk group controls that can be assigned to each preplan in the table. Table NWMPPLN also specifies whether the preplan can be referenced by entries in table CCS7PPLN which will always be the case for this feature.
- Table ISUPDEST (ISDN User Part Destination) contains the key field, DESTKEY, and one result field, ISUPROUT. The ISUP routeset name is used to access table C7RTESET to obtain the network and point code information that specifies the portion of a SNID logically associated with a trunk group or subgroup.
- Table PREPLANS (Network Management Preplans) contains the short CLLI to which the preplan control applies and the type of control that applies to the preplan. The length of table PREPLANS depends on the values of field NCTRLS in table NWMPPLN.
- Table NWMIDOC (Network Management Internal Dynamic Overload Control) contains the threshold levels for CL1 and CL2, for example, the percentage of CPU occupancy for call processing that triggers CL1 and CL2, as well as the level that turns off CL1 and CL2. Filter times, in

Automatic Congestion Control (ACC) (continued)

minutes, are associated with each set of thresholds. Thresholds specify a time interval before a control is activated and/or deactivated.

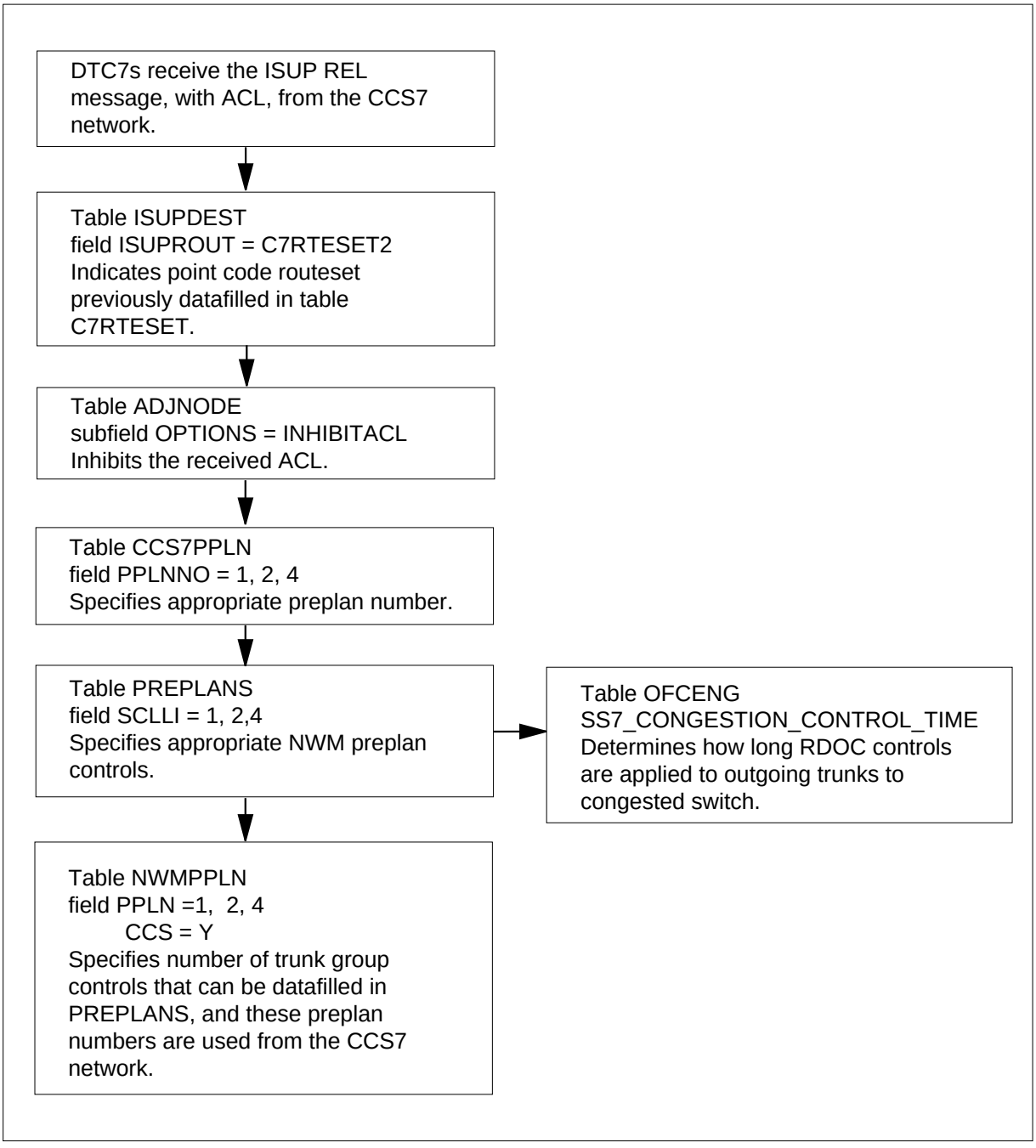
The Automatic Congestion Control (ACC) translation process is shown in the flowchart that follows.

Table flow for Automatic Congestion Control (ACC): congestion detection



Automatic Congestion Control (ACC) (continued)

Table flow for Automatic Congestion Control (ACC): receipt of congestion



Automatic Congestion Control (ACC) (continued)

The following table lists the datafill content used in the flowchart.

Datafill example for Automatic Congestion Control (ACC)

Datafill table	Example data
NWMIDOC	1 70 5 69 5 70 5 69 5 0 02 80 5 79 5 80 5 79 5 0 0
ADJNODE	DMS30 ISUP DMS (DONTSENDACL) $ DMS31 ISUP DMS (INHIBITACL) $
ISUPDEST	ISUPINC 0 C7RTESET2 ISUPOTG 0 C7RTESET1 ISUP2W 0 C7RTESET1
CCS7PPLN	C7RTESET1 11 12 11 C7RTESET2 11 12 11
PREPLANS	11 0 ISUP2W CANT 25 50 NCA 12 0 ISUP2W CANT 50 100 NCA
NWMPPLN	11 8 Y 12 8 Y

Limitations and restrictions

The following limitations and restrictions apply to Automatic Congestion Control (ACC):

- RDOC controls are activated only for direct connecting switches. Direct connecting switches are two switches connected directly by trunks.
- Table CCS7PPLN should only contain point code names of direct connecting switches to which congestion controls are to be applied.
- Applied NWM controls do not survive a cold (or greater) restart, but do survive a warm restart.
- Automatic PPLN controls are activated/removed on a routeset basis, but manual PPLN controls are activated/removed on a trunk group basis.
- This feature adds option DONTSENDACL to table ADJNODE. In the congested switch, this allows the ACC facility to be enabled or disabled on a per connected switch trunk group basis. This option is inserted into the trunk data message area, which enables the XPM (DTC7, PTC) to check for ACC at adjacent switches. Therefore after adding option DONTSENDACL to table ADJNODE, the technician must BSY and RTS all trunk members of the trunk group at the MAP terminal, for the inhibiting of ACL parameter to take effect. This must be done for each trunk subgroup that references this entry into table ADJNODE.

Automatic Congestion Control (ACC) (continued)

Interactions

Automatic Congestion Control (ACC)ACC applies NWM controls that, when set, interact with other features. ACC implements option DONTSENDACL in table ADJNODE. By default, the ACL optional parameter is sent from the congested DMS office. To disable the sending of the ACL parameter, operating company personnel must add option DONTSENDACL for the selected trunk groups in table ADJNODE. After option DONTSENDACL has been added to table ADJNODE, a busy and return to service of the trunk groups is required for the change to take effect.

Activation/deactivation by the end user

Automatic Congestion Control (ACC) requires no activation or deactivation by the end user.

Billing

Automatic Congestion Control (ACC) does not affect billing.

Station Message Detail Recording

Automatic Congestion Control (ACC) does not affect Station Message Detail Recording.

Datafilling office parameters

The following table shows the office parameters used by Automatic Congestion Control (ACC). For more information about office parameters, refer to *Office Parameters Reference Manual*.

Office parameters used by Automatic Congestion Control (ACC)

Table name	Parameter name	Explanation and action
OFCVAR	INHIBIT_AUTO CONGESTION_CNTL	Used to block the sending of the ISDN User Part Release Message (ISUP REL message) Automatic Congestion Level (ACL) parameter on an office-wide basis. The default is N.
OFCENG	SS7_CONGESTION_CONTROL_ TIME	Used to indicate the amount of time that it takes to deactivate the Automatic Congestion Control (ACC) Network Management (NWM) Preplan Controls. The default is 5 seconds.

Automatic Congestion Control (ACC) (continued)

Datafill sequence

The following table lists the tables that require datafill to implement Automatic Congestion Control (ACC). The tables are listed in the order in which they are to be datafilled.

Datafill tables required for Automatic Congestion Control (ACC)

Table	Purpose of table
NWMIDOC	This table contains the threshold levels for CL1 and CL2, for example, the percentage of CPU occupancy for call processing that triggers CL1 and CL2, as well as the level that turns off CL1 and CL2.
ADJNODE	This table contains information about the type of software running in an adjacent node.
ISUPDEST	This table contains the ISUP routeset name that is used to access table C7RTESET to obtain the network and point code information that specifies the portion of a SNID logically associated with a trunk group or subgroup.
NMWPPLN	This table lists the maximum number of trunk group controls that can be assigned to each preplan in the table.
PREPLANS	This table contains the short CLLI to which the preplan control applies and the type of control that applies to the preplan.
CCS7PPLN	This table contains the far-end routeset of the point code that triggers dynamic overload control (DOC) levels 1, 2, and 3. Each entry in table CCS7PPLN contains a preplan number for the three DOC levels.

Datafilling table NWMIDOC

The following table shows the datafill specific to Automatic Congestion Control (ACC) for table NWMIDOC. Only those fields that apply directly to Automatic Congestion Control (ACC) are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table NWMIDOC (Sheet 1 of 2)

Field	Subfield or refinement	Entry	Explanation and action
CPONTHLD		0 to 100	*CPU ON threshold* Enter the threshold percentage that activates the control. For levels 1 and 2, the range is 0 to 100.

Automatic Congestion Control (ACC) (continued)

Datafilling table NWMIDOC (Sheet 2 of 2)

Field	Subfield or refinement	Entry	Explanation and action
CPONFILT		0 to 15	*CPU ON filter* Enter the number of 1-min intervals that the ON threshold value must exceed before the control is activated. For levels 1 and 2, the range is 0 to 15.
CPOFTHLD		0 to 100	*CPU OFF threshold* Enter the threshold percentage that deactivates the control. For levels 1 and 2, the range is 0 to 100.
CPOFFILT		0 to 15	*CPU OFF filter* Enter the number of 1-min intervals that the OFF threshold value must reach before the control is deactivated. For levels 1 and 2, the range is 0 to 15.

Datafill example for table NWMIDOC

The following example shows sample datafill for table NWMIDOC.

MAP display example for table Automatic Congestion Control (ACC)NWMIDOC

```
IDOCLEV MFONTHLD MFONFILT MFOFTHLD MFOFFILT CPONTHLD CPONFILT CPOFTHLD
CPOFFILT SDGROUP SDPT
_____________________________________________________________________

      1        70         5       69        5        70        5       69
      5         0       0

      2        80         5       79        5        80        5       79
      5         0       0
```

Datafilling table ADJNODE

The following table shows the datafill specific to Automatic Congestion Control (ACC) for table ADJNODE. Only those fields that apply directly to

Automatic Congestion Control (ACC) (continued)

Automatic Congestion Control (ACC) are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table ADJNODE

Field	Subfield or refinement	Entry	Explanation and action
SIGDATA		see subfields	*Signaling data* This field consists of many subfields. Only subfields PRODUCT and OPTIONS apply to this feature.
	PRODUCT	DMS	*Product type* Enter the type of product that is in the adjacent switch.
	OPTIONS	DONTSENDACL INHIBITACL	*ISDN user part option elements*Enter DONTSENDACL to control when the ACL parameter is populated in the ISUP REL message in the congested office. ***Note:*** In Gateway offices, option AUTOCON is used in place of DONTSENDACL. This is to maintain the current functionality of AUTOCON. Enter INHIBITACL to block the processing of the ACL parameter on a node level. This option is applied to the switch that receives the ACL parameters from the CCS7 network. Network Management Preplans are not allowed if ACLs are not processed.

Datafill example for table ADJNODE

The following example shows sample datafill for table ADJNODE.

MAP display example for table ADJNODE

```
ADJNODEK SIGDATA
                                                          SIGDATA
_____________________________________________________________________
DMS30    ISUP                        DMS        (DONTSENDACL) $
DMS31    ISUP                        DMS         (INHIBITACL) $
```

Automatic Congestion Control (ACC) (continued)

Datafilling table ISUPDEST

The following table shows the datafill specific to Automatic Congestion Control (ACC) for table ISUPDEST. Only those fields that apply directly to Automatic Congestion Control (ACC) are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table ISUPDEST

Field	Subfield or refinement	Entry	Explanation and action
DESTKEY		see subfields	*Destination key* This field consists of subfields CLLI and SGRP.
	CLLI	alphanumeric (up to 16 characters)	*Common language location identifier* Enter the code assigned to the ISUP, BTUP, or MBTUP trunk group in table CLLI.
	SGRP	0 or 1	*Subgroup number* Enter the number assigned to the ISUP, BTUP, or MBTUP trunk subgroup.
ISUPROUT		alphanumeric (up to 16 characters)	*CCS7 ISDN user part routeset name* Enter the routeset name that provides the network and point code information from table C7RTESET. This specifies the portion of the SNID that is logically associated with this trunk group. The routeset name entered here must already be datafilled in table C7RTESET.

Datafill example for table ISUPDEST

The following example shows sample datafill for table ISUPDEST.

MAP display example for table ISUPDEST

```
        DESTKEY     ISUPROUT
_____________________________________________________________

        ISUPINC 0 C7RTESET2
        ISUPOTG 0 C7RTESET1
        ISUP2W  0 C7RTESET1
```

Datafilling table CCS7PPLN

The following table shows the datafill specific to Automatic Congestion Control (ACC) for table CCS7PPLN. Only those fields that apply directly to Automatic Congestion Control (ACC) are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table CCS7PPLN

Field	Subfield or refinement	Entry	Explanation and action
PCNAME		alphanumeric (1 to 16 characters)	*Point code name* Enter the name of a point code routeset that has been previously datafilled in table C7RTESET.
PPLNNO		3 entries, each with a value from0 to 255	*Preplan number* Specifies the machine congestion preplan number. Enter the preplan number for congestion number 1, 2, and 3.

Datafill example for table CCS7PPLN

The following example shows sample datafill for table CCS7PPLN.

MAP display example for table CCS7PPLN

```
   PCNAME                          PPLNNO
-------------------------------------------------
C7RTESET1          11          12          11
C7RTESET2          11          12          11
```

Datafilling table PREPLANS

The following table shows the datafill specific to Automatic Congestion Control (ACC) for table PREPLANS. Only those fields that apply directly to

Automatic Congestion Control (ACC) (continued)

Automatic Congestion Control (ACC) are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table PREPLANS

Field	Subfield or refinement	Entry	Explanation and action
PPLN		see subfields	*Preplan* This field consists of subfields PPLNNO and PPLNCTRL.
	PPLNNO	0 to 255	*Preplan number* Enter the preplan number.
	PPLNCTRL	0 to 31	*Preplan control number* Enter the preplan control number.
SCLLI		alphanumeric (6 character vector)	*Short common language location identifier* (CLLI) name of the trunk group to which the preplan control applies. The short CLLI (SCLLI) is defined in table CLLIMTCE.
CTRL		BSSKIP, CANF, CANT, DRE, FRR, ITB, ITO, PRE, SKIP, STR, or TASI	*Control data* This field specifies the trunk group control parameters.

Datafill example for table PREPLANS

The following example shows sample datafill for table PREPLANS.

MAP display example for table PREPLANS

```
     PPLN    SCCLI     CTRL          CTRLDATA
     ------------------------------------------------------
     11   0  ISUP2W    CANT    25  50     NCA
     12   0  ISUP2W    CANT    50  100    NCA
```

Automatic Congestion Control (ACC) (continued)

Datafilling table NWMPPLN

The following table shows the datafill specific to Automatic Congestion Control (ACC) for table NWMPPLN. Only those fields that apply directly to Automatic Congestion Control (ACC) are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table NWMPPLN

Field	Subfield or refinement	Entry	Explanation and action
PPLN		0 to 255	*Preplan number* Enter the preplan number.
NCTRLS		0 to 32	*Number of preplan controls* Enter the maximum number of trunk group controls that can be assigned to the preplan number. Any entry outside this range is not valid.
CCS		Y or N	*Common channel signaling* Enter Y (yes) if the entry in table CCSDOC refers to a control in this preplan. Enter N (no) if an entry in table NWMSCPT refers to this preplan. For ACC, enter Y (yes) to allow this preplan number (PPLN) to be datafilled in table CCS7PPLN.

Datafill example for table NWMPPLN

The following example shows sample datafill for table NWMPPLN.

MAP display example for table NWMPPLN

```
     PPLN     NCTRLS   CCS
_____________________________________________________________
        11          8   Y
        12          8   Y
```

Automatic Congestion Control (ACC) (end)

Translation verification tools

Automatic Congestion Control (ACC) does not use translation verification tools.

SERVORD

Automatic Congestion Control (ACC) does not use SERVORD.

ISUP Hop Counter

Ordering codes

Functional group ordering code: ISP70001

Functionality ordering code: ISP70002

Release applicability

SN07 (DMS) and up

Prerequisites

All the datafill information for this particular functionality is included in this document. However, prerequisite software or hardware may be required for complete implementation.

Description

The ISUP Hop Counter feature prevents infinite transmission loops of ISDN User Part (ISUP) Initial Address Messages (IAM). Due to incorrect translation entries in some switches, many IAMs related to the same call may be transmitted back and forth between switches, trapping the IAM in an endless loop and preventing the message from being translated for subsequent call processing.

To prevent this situation, this feature introduces the hop counter (HC) parameter in the ISUP IAM. The HC parameter enables an operating company to set a limit on the number of intermediate switches through which an IAM can pass in an ISUP network.

Note: In this context, an *intermediate switch* is defined as any switch other than the originating or destination switch.

Operation

The ISUP Hop Counter feature introduces modifications to the Common Channel Signaling 7 (CCS7) protocol to handle the ISUP HC IAM parameter. In an outgoing IAM, a value can be assigned to the HC; this value is decremented on each pass through an intermediate switch that has the HC functionality activated. The call is released when the IAM has not reached the destination switch and the HC value has expired. In this case, a release (REL) message is sent back to the originating switch with a cause value of “Exchange Routing Error." Associated log reports are produced, and operational measurement (OM) registers are incremented at specific exchanges. Normal call processing is applied if the call can be completed.

ISUP Hop Counter (continued)

Software Optionality Control

Access to the HC functionality is controlled through the implementation of Software Optionality Control (SOC). The SOC ordering code for the HC functionality is ISP70002. There are no other SOC dependencies.

The SOC utility provides a mechanism for software functionality to be included in a product computing module (CM) load but not enabled until Northern Telecom (Nortel) provides a license and the operating company activates the option. Therefore, the HC functionality can be in one of two stable states: ON or IDLE. When the HC SOC option is in the IDLE state, the HC functionality is deactivated, but the operating company datafill to table TRKSGRP and office parameter MAX_IAM_HOPS in table OFCVAR (Office Variable) is allowed (although there is no effect until the HC SOC option has been activated). In the IDLE state, the HC parameter is not added to any IAMs, and incoming IAMs are not parsed for the HC parameter. No HC log reports are generated, and the ISERRHOP register is not incremented.

The HC functionality is supplied in all loads in the IDLE state. Access is controlled using SOC. To activate the HC functionality, the operating company must possess the HC SOC keycode (password), which is supplied by Nortel. This keycode is entered at the MAP (maintenance and administration position) command interpreter (CI) CI:SOC level.

By default, when the HC SOC option has been activated, the HC functionality is enabled for the entire switch. The functionality can be disabled by an option (NO_HOP) in table TRKSGRP. Provisioning of the HC value can be performed on a switch basis using office parameter MAX_IAM_HOPS.

Hop counter parameter

The HC is an optional IAM parameter. An originating switch does not add the HC parameter to an IAM, but the HC parameter is added to a received IAM at an intermediate switch that has the ISUP Hop Counter feature enabled on the outgoing trunk.

When an IAM containing an HC parameter is received by an intermediate switch, the HC value is decremented (HC calculated value), and the following occurs:

- If the HC value has expired, a REL message with a cause value of “Exchange Routing Error" is sent to the preceding switch. Log report

C7UP130 is generated, and the ISUP HC and treatment OM registers are incremented.

- If the decremented HC value has not expired and call forwarding is being performed, the HC value in the outgoing IAM is set to the provisioned HC value of the switch.
- If the decremented HC value has not expired and call forwarding is not being performed, the following occurs:
  - — If the ISUP Hop Counter feature is activated for the outgoing trunk group, the calculated HC value is included in the outgoing IAM.
  - — If the ISUP Hop Counter feature is not activated for the outgoing trunk group, the HC value in the outgoing IAM is set to the initial HC value that was received in the incoming IAM.

When an IAM that does not contain an HC parameter is received by an intermediate switch, or when a call setup signal is received through a non-CCS7 incoming trunk (for example, a per-trunk signaling [PTS] trunk) and is outgoing on a CCS7 trunk, the following occurs:

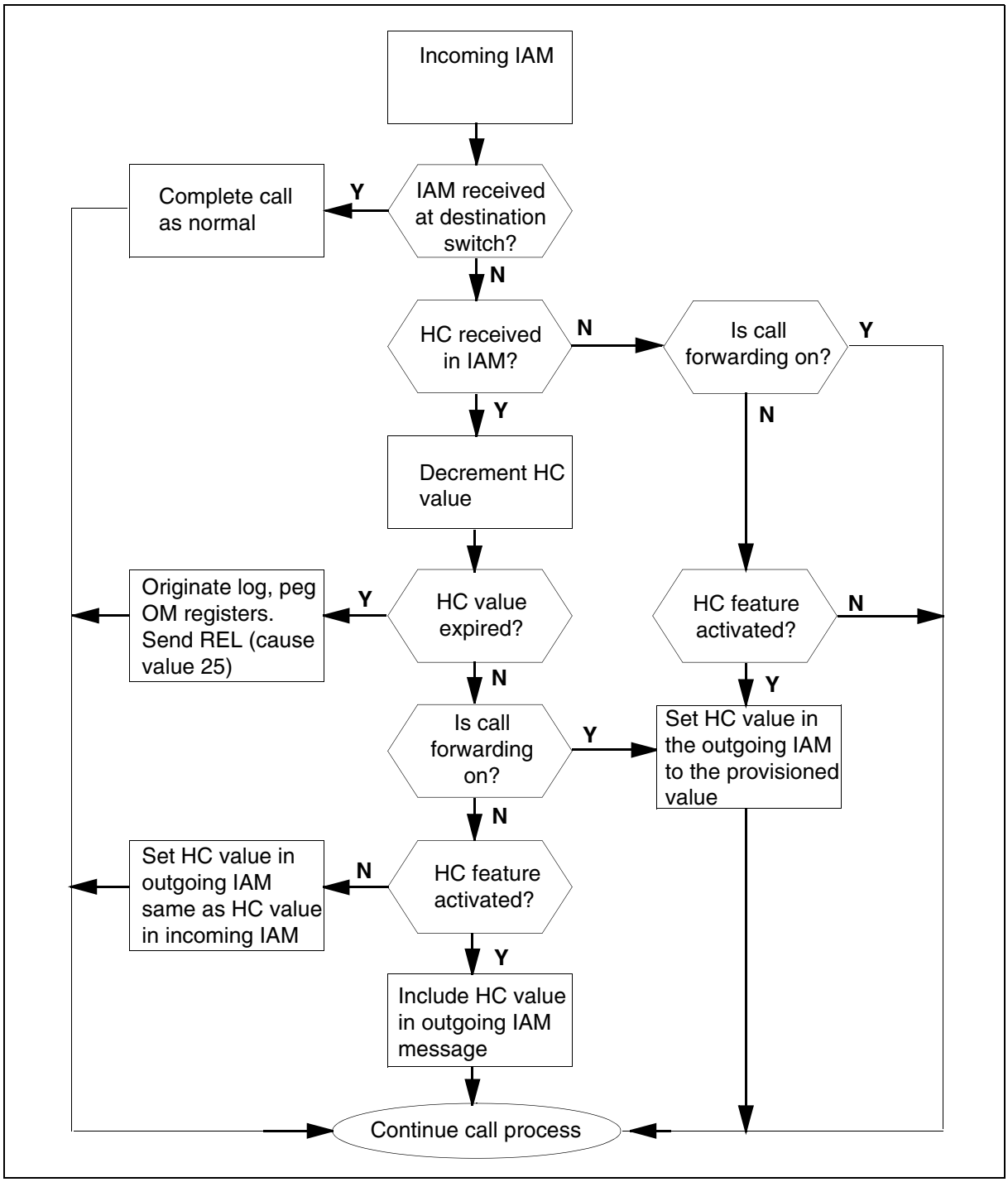
- If call forwarding is not being performed and the ISUP Hop Counter feature is activated for the outgoing trunk, the HC value in the outgoing IAM is set to the provisioned HC value of the switch.
- If call forwarding is not being performed and the ISUP Hop Counter feature is not activated for the outgoing trunk, no HC parameter is added to the outgoing IAM.
- If call forwarding is being performed, the IAM is processed as normal.

Note: The HC parameter is not included by the originating switch. The HC parameter is not referenced at the final destination switch (not call forwarded); the call is completed regardless of the HC value.

Switches that do not have the HC functionality installed and receive an IAM with no HC parameter from the preceding exchange do not include the HC parameter. If an IAM containing the HC parameter is received by a switch that does not have the HC functionality installed, the switch passes the HC parameter transparently for outgoing CCS7. Refer to the following figure.

ISUP Hop Counter (continued)

Functional flow diagram of hop counter feature



ISUP Hop Counter (continued)

When an IAM containing an HC parameter is received by an intermediate switch and the calculated HC value has expired, a treatment is applied to send a REL message with cause value “Exchange Routing Error" to the originating switch. This treatment also increments the following OM registers at the originating switch:

- TRMTFR3 group, register FRSPR2
- ISUPERRS group, register ISERRHOP

ISUP log report C7UP130 is generated indicating that the call was taken down due to the HC value.

When the REL message reaches the intermediate switch that set the HC parameter to the provisioned value, another ISUP log report (C7UP301) is generated indicating that a REL message with cause value “Exchange Routing Error" has been received. The cause value in the REL message is then changed to “Normal-Unspecified" and sent back to the originating switch. A Release Complete (RLC) message is sent in the forward direction as normal.

If the originating exchange receives the REL message with cause value “Exchange Routing Error" (this should never occur), a C7UP301 log report is generated.

Log reports C7UP130 and C7UP301

This feature introduces two log reports: C7UP130 and C7UP301. Both log reports appear in standard format.

A C7UP130 FLT log report is generated at an intermediate switch when the calculated HC value of an incoming IAM has expired. There is no alarm value associated with this log report. The log report contains the following information:

- calling party number (if available)
- called party number
- originating point code (OPC) of the preceding service switching point (SSP)
- incoming circuit identification code (CIC)
- incoming agent circuit ID

A C7UP301 trouble (TBL) log report is also generated in response to a REL message with the cause value of “Exchange Routing Error" being received at the last switch that set the HC parameter to the provisioned value. This could be a call forwarding switch if call forwarding has been performed on behalf of

ISUP Hop Counter (continued)

the called party or the first intermediate switch. There is no alarm value associated with this log report. The log report contains the following information:

- calling party number (if available)
- called party number
- OPC of the preceding SSP
- incoming CIC
- incoming agent circuit ID

Normal log reporting occurs at any DMS switch that receives a REL message with a cause value of “Normal-Unspecified".

Data schema

Office parameter MAX_IAM_HOPS

The provisioned value of the HC parameter is stored in office parameter MAX_IAM_HOPS in table OFCVAR. Valid values for this parameter are 10 to 20 (inclusive).

Datafill tables

Operational measurements

The ISUP Hop Counter feature adds register ISERRHOP to the ISUPERRS OM group. The following is an example of the OMSHOW ISUPERRS output with register ISERRHOP added:

ISUP Hop Counter registers display on the MAP terminal as follows:

```
ISERRRSC        ISERRGRS        ISERRBLO        ISERRBAD
ISERRRLC        ISERRREL        ISERRHOP
```

Register ISERRHOP tracks the number of calls cleared due to expiration of the HC being detected by the switch within a transfer period. This register has a maximum value of 65,535 counts within a single transfer period. The transfer period is set on an OM group basis and is controlled by datafill in office parameter OMXFR in table OFCENG (Office Engineering).

Note: The transfer period is defined as the time span (in minutes) of an OM measurement interval.

ISUP Hop Counter (continued)

An existing spare treatment OM register, FRSPR2, is used in the treatment OM group TRMTFR3. This OM register is incremented when the treatment to send a REL message with a cause value of “Exchange Routing Error" is applied. The following is an example of the OMSHOW TRMTFR3 output with register FRSPR2:

```
FRSPR1      FRRTEERR    FRSPR3      FRSPR4
FRSPR5      FRSPR6      FRSPR7      FRSPR8
FRSPR9      FRSPR10     FRSPR11     FRSPR12
FRSPR13     FRSPR14     FRSPR15     FRSPR16
FRSPR17     FRSPR18     FRSPR19     FRSPR20
FRSPR21     FRSPR22     FRSPR23     FRSPR24
FRSPR25     FRSPR26     FRSPR27     FRSPR28
FRSPR29     FRSPR30     FRSPR31     FRSPR32
```

Translations table flow

ISUP Hop Counter does not affect translations table flow.

Limitations and restrictions

The following limitations and restrictions apply to ISUP Hop Counter:

- When the HC SOC functionality is activated using an SOC keycode, the ISUP Hop Counter feature is activated for the entire switch by default.
- The ISUP Hop Counter feature affects the following trunk types:
  - IBN
  - IBN feature group D (FGD)
  - access tandem to carrier (ATC)
  - intertoll (IT)
  - T2 (TI / TO) for Q764 ISUP trunks in North America
- The provisioned HC value stored in office parameter MAX_IAM_HOPS is in the range of 10 to 20 inclusive.
- The operating company can deactivate the ISUP Hop Counter feature for a given trunk subgroup using standard datafill procedures.

Interactions

Call Forwarding

The ISUP Hop Counter feature interacts with the existing Call Forwarding feature. This interaction involves the detection of call forwarding being performed so that the appropriate HC action is executed. For example, when

ISUP Hop Counter (continued)

an IAM reaches a switch that is performing call forwarding for the called party and where the HC parameter is present in the IAM, the HC value is set to the provisioned value for the outgoing IAM.

Activation/deactivation by the end user

ISUP Hop Counter requires no activation or deactivation by the end user.

Billing

ISUP Hop Counter does not affect billing.

Station Message Detail Recording

ISUP Hop Counter does not affect Station Message Detail Recording.

Datafilling office parameters

The following table shows the office parameter used by ISUP Hop Counter. For more information about office parameters, refer to *Office Parameters Reference Manual.*

Office parameter used by ISUP Hop Counter

Table name	Parameter name	Explanation and action
OFCVAR	MAX_IAM_HOPS	This parameter specifies the maximum number of transfers (hops) that an ISUP IAM related to one call can make between exchanges. This number of hops may range from 10 through 20. The default value is 20.

Datafill sequence

The following table lists the tables that require datafill to implement ISUP Hop Counter.

Datafill tables required for ISUP Hop Counter

Table	Purpose of table
TRKSGRP	The trunk subgroup table lists the supplementary information for each subgroup that is assigned to one of the trunk groups listed in table TRKGRP.

Datafill tables required for ISUP Hop Counter

Table	Purpose of table
TMTMAP	Table TMTMAP provides mapping of DMS treatments to call failure messages supported by certain Signaling System 7 protocols. Datafill in the table determines whether the treatment is reported to the preceding exchange (and if so, by what message) or whether DMS applies the treatment locally, in which case the usual datafill in table TMTCNTL, subtable OFFTREAT, determines the outcome.
TMTCNTL.OFFTREAT	The treatment control table defines all treatments. The office treatment subgroup table defines the tones, announcements, and states (for example, IDLE), that are returned to the call originator if a specified treatment code is encountered during call translation.

Datafilling table TRKSGRP

The HC functionality is disabled by option NO_HOP in table TRKSGRP. The ISUP Hop Counter feature can therefore be disabled on a trunk subgroup basis.

The following table shows the datafill specific to ISUP Hop Counter for table TRKSGRP. Only those fields that apply directly to ISUP Hop Counter are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table TRKSGRP

Field	Subfield or refinement	Entry	Explanation and action
SGRPVAR			Variable subgroup data. This field consists of several subfields, only subfiled OPTION applies to this feature.
	OPTION	NO_HOP	Enter the NO_HOP option to indicate that for this trunk subgroup the hop counter (HC) parameter is not included in IAMs originating from this switch. The HC value of an incoming IAM is not decremented if the IAM is being tandemed using an outgoing trunk subgroup with the NO_HOP option datafilled (the HC parameter is passed transparently). When the HC functionality is activated (by using a SOC keycode), it is activated for the entire switch (no tuples in table TRKSGRP contain the NO_HOP option). This option is only valid for Q764 two-way and outgoing trunks.

ISUP Hop Counter (continued)

Datafill example for table TRKSGRP

The following example shows sample datafill for table TRKSGRP.

MAP display example for table TRKSGRP

```
           SGRPKEY   CARDCODE
    SGRPVAR
                                                        SGRPVAR
-------------------------------------------------------------
          CCITT2W 0 DS1SIG
C7UP
 2W N N UNEQ NONE CCITT THRH 0 DMSNODE C72W (NO_HOP)
```

Datafilling table TMTMAP

Table TMTMAP (Treatment to Cause Map) must be updated to allow for the treatment that the HC uses.

An entry of XLAFAIL_ANSI for the CAUSE value will allow the sending and receipt of ISUP cause value 25 with a coding standard of National (ANSI). The coding standard of XLAFAIL is CCITT.

The following table shows the datafill specific to ISUP Hop Counter for table TMTMAP. Only those fields that apply directly to ISUP Hop Counter are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table TMTMAP

Field	Subfield or refinement	Entry	Explanation and action
TMTMPVAR			Treatment map
	TMTPROC	NOLOCAL	Treatment procedure selector. Enter NOLOCAL and datafill refinements CAUSE, LOCATION and LOG if the treatment is mapped to a cause and always included in a release message.

ISUP Hop Counter (continued)

Datafilling table TMTMAP

Field	Subfield or refinement	Entry	Explanation and action
	CAUSE	XLAFAIL	ISUP cause. This cause occurs when an intermediate switch receives an IAM containing an ISUP HC value, and the HC value has expired. This causes a REL message to be sent back through the network with a cause value set to ``Exchange routing error" and a coding standard of CCITT.
	CAUSE	XLAFAIL_ ANSI	ISUP cause. This cause occurs when an intermediate switch receives an IAM containing an ISUP HC value, and the HC value has expired. This causes a REL message to be sent back through the network with a cause value set to ``Exchange routing error" and a coding standard of National (ANSI).
	LOCATION		Cause indicator location. Enter the LOCATION value included in the cause indication parameter (CIP) included in ISUP RELs (CCS7 Release message), if the message is sent as part of a treatment. The LOCATION field is stored as a unique 4-bit value in the CIP. The value of the LOCATION field varies with call scenarios, but the common denominator of all these scenarios is that the public network is serving the local user. This field is only applicable if TMTPROC is not LOCAL. The default value is LOCLNET.
	LOG	Y or N	Generate log. Enter Y (yes) to generate a TRK138 log if a release with cause is sent. Otherwise, enter N (no).

Datafill example for table TMTMAP

The following example shows sample datafill for table TMTMAP. The switch detects that the hop counter (HC) value in an initial address message (IAM) has been exceeded, and the call is released with a cause value of 25 and a coding standard of CCITT. To send a cause value of 25 with a coding standard of National (ANSI), use cause entry XLAFAIL_ANSI in table TMTMAP.

ISUP Hop Counter (continued)

MAP display example for table TMTMAP

```
TMTMPKEY     TMTMPVAR
_____________________________________________________________________
Q764     RTEE         ALLBC      ISUP    NOLOCAL    XLAFAIL    LOCLNET  Y
```

Datafilling table TMTCNTL.OFFTREAT

A tuple must be added to table TMTCNTL.OFFTREAT (Treatment Control Office Treatment Subtable) to allow the treatment to be mapped to a cause value:

The following table shows the datafill specific to ISUP Hop Counter for table TMTCNTL.OFFTREAT. Only those fields that apply directly to ISUP Hop Counter are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table TMTCNTL.OFFTREAT

Field	Subfield or refinement	Entry	Explanation and action
TREATMT		alphanumeric (1 to 4 characters)	Treatment Enter the treatment name.
LOG		Y or N	Log Enter Y for a trunk or line message 138 printout each time translation is routed to a treatment. Otherwise, enter N.
FSTRTE		see subfields	First route This field consists of subfields FSTRTSEL, TABID, and KEY.
	FSTRTSEL	T	First route selector Enter the first route selector T.
	TABID	OFRT OFR2 OFR3 or OFR4	Table name Enter the office route table name.
	KEY	1 to 1023	Key Enter the index into the office route table which defines the route list for the treatment. The entry zero (0) cannot be datafilled by the operating company.

MAP display example for table TMTCNTL.OFFTREAT

```
TREATMT   LOG      FSTRTE
_____________________________________________________________
RTEE      Y        T OFRT 58
```

Translation verification tools

ISUP Hop Counter does not use translation verification tools.

SERVORD

ISUP Hop Counter does not use SERVORD.

Feature history

SN07 (DMS)

Added references to new cause value XLAFAIL_ANSI. This is used to map cause value of “exchange routing error” using a coding standard of National (ANSI) if needed. CR Q00760514-10.

Feature history section added.

ISUP/IBN Feature Interaction

Ordering codes

Functional group ordering code: SS700001

Functionality ordering code: not applicable

Release applicability

BCS24 and up

Prerequisites

To operate, ISUP/IBN Feature Interaction has the following prerequisites:

- BAS Generic, BAS00003
- TEL CCS7 Base, TEL00008
- MDC Standard, MDC00003

Description

ISUP/IBN Feature Interaction combines features AC0249, ISUP/IBN Feature Interaction II and AC0251, ISUP/IBN Feature Interaction III. The ISUP/IBN Feature Interaction III (3WC, EBO, DCPU) feature provides direct interworking between ISDN user part (ISUP) trunks and the following MDC features:

- Three-Way Calling (3WC)
- Call Transfer (CXR)
- Directed Call Pickup (DCPU)
- Directed Call Pickup - Barge In (DCBI)
- Executive Busy Override (EBO).

ISUP/IBN Feature Interaction removes the necessity for loop-around trunks by allowing ISUP trunks to work with the MDC features listed above. Loop-back trunks are still required for calls to the attendant console (AC) and for calls that involve direct inward system access (DISA) and attendant call park retrieval of ISUP trunks. The feature is one of several which introduce ISUP to the MDC feature environment.

Note: Because information messages concerning feature activation are not transmitted between end offices, networking is not provided.

Operation

Direct interworking of ISUP trunks with 3WC, CXR, DCPU, DCBI, and EBO involves the exchange of Common Channel Signaling No. 7 (CCS7) protocol

ISUP/IBN Feature Interaction (continued)

messages between switching offices. The CCS7 protocol messages as well as suspend (SUS) messages and ISUP disconnect timer values are all discussed in detail following the basic scenario descriptions for each feature.

Three-Way Calling

An ISUP trunk can interact directly with Three-Way Calling (3WC) as the first or second leg of a three-way call or as a conferee in a 3WC conference. Such interaction is provided for both plain old telephone service (POTS) and MDC 3WC.

In the following examples, all of the parties are MDC lines with the 3WC feature. For clarity, call transfer, which is discussed in detail in the following section, is not permitted by any of the parties in this section.

ISUP trunk as the first leg of a three-way call

In the following figure, an ISUP trunk is the first leg of a three-way call. Party A is the controller, party B is the first leg, and party C is the second leg of the three-way call. (An ISUP trunk is not permitted to be the controller of a three-way call because networking is not supported.)

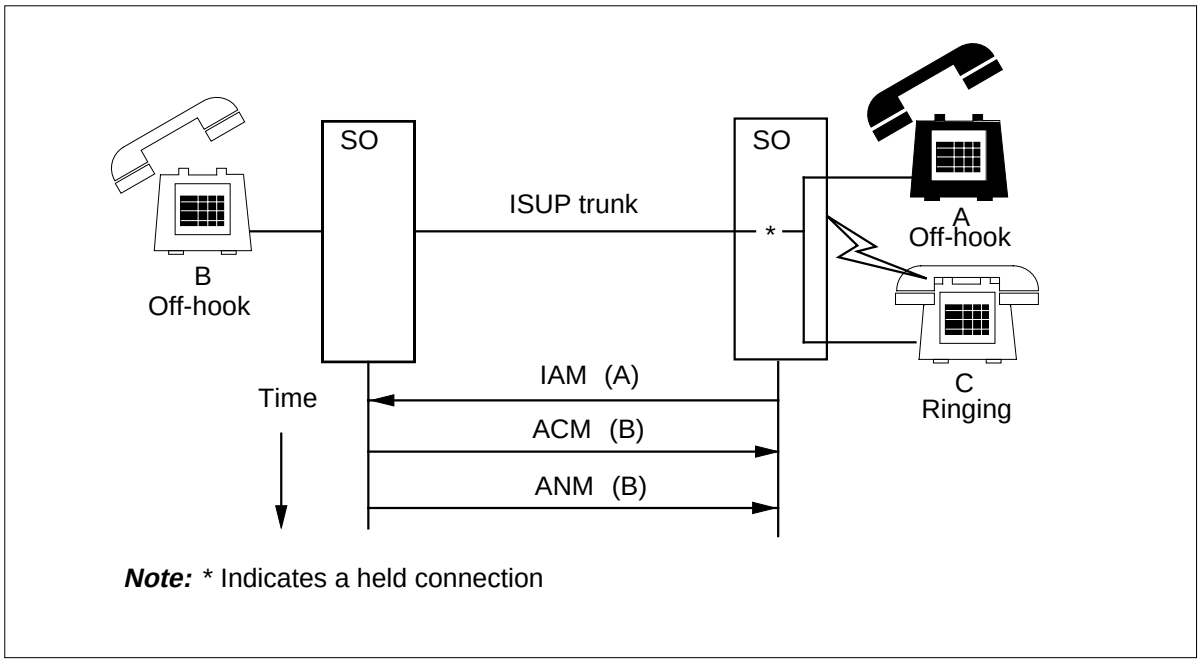
- A dials over the ISUP trunk to B.
- A activates 3WC.
- A dials C.

If C answers, A and C can talk. B hears silence until A either conferences in C, releases C, flips back to B (electronic business set [EBS] only), or transfers B to C. If A releases C, A and B are reconnected. If A flips from C to B, A and B are connected while C hears silence.

> ***Note:*** Flip and flop apply to EBS sets only. A flip is the event that occurs when the 3WC controller hits the Directory Number (DN) key to consult privately with the first leg of the call. A flop indicates that the 3WC controller has gone back to the second leg of the call by hitting the 3WC key after having previously flipped.

The CCS7 messaging is for the setup of the initial call between A and B. The initial address message (IAM) is sent from A's switching office (SO) while B's SO returns an address complete message (ACM) and an answer message (ANM). No further protocols are sent between the SOs for the setup of the A to C call. If B had originated the call to A, the direction of the CCS7 protocol messages would be reversed. With the connections shown, A hears audible ringing, C receives physical ringing, and B hears silence while the connection is held.

ISUP trunk as the first leg of a three-way call



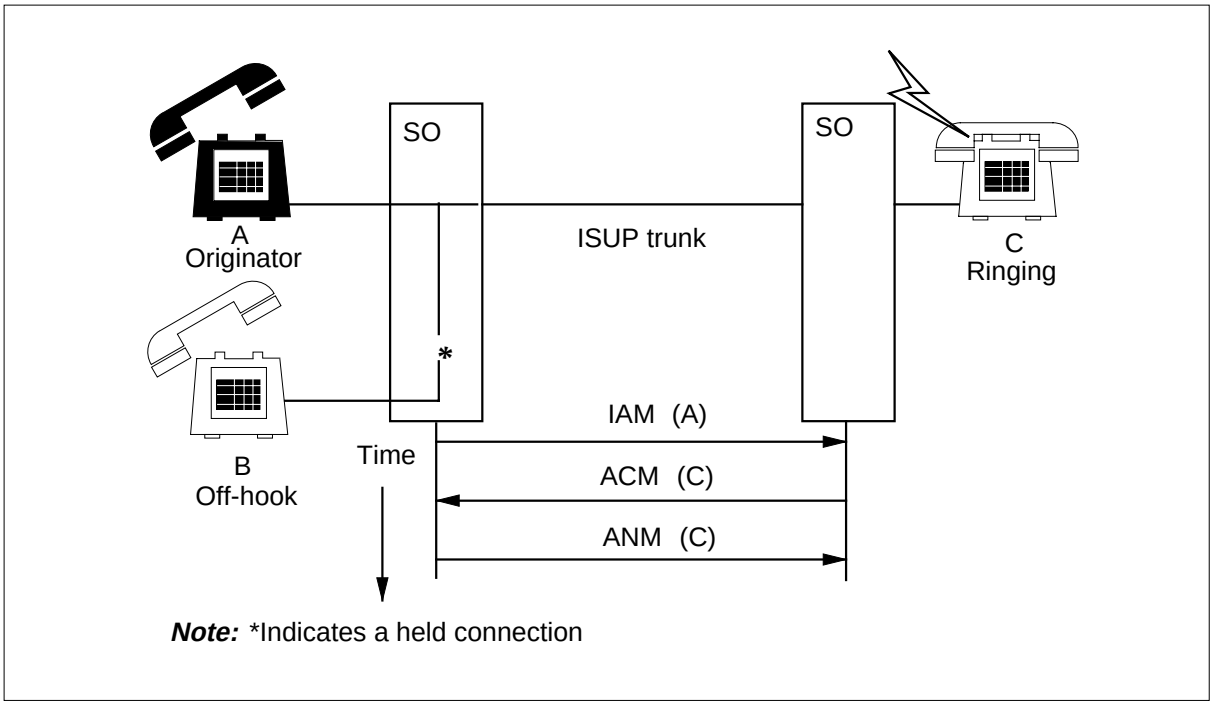
Note: * Indicates a held connection

In the following figure, the ISUP trunk is the second leg of a three-way call. The CCS7 protocol messages are a result of the A to C portion of the call.

- A dials B.
- A activates 3WC and dials over an ISUP trunk to C.
- C answers.
- B is held.
- A and C talk.

ISUP/IBN Feature Interaction (continued)

ISUP trunk as the second leg of a three-way call



ISUP trunk as the second leg of a three-way call with a busy party

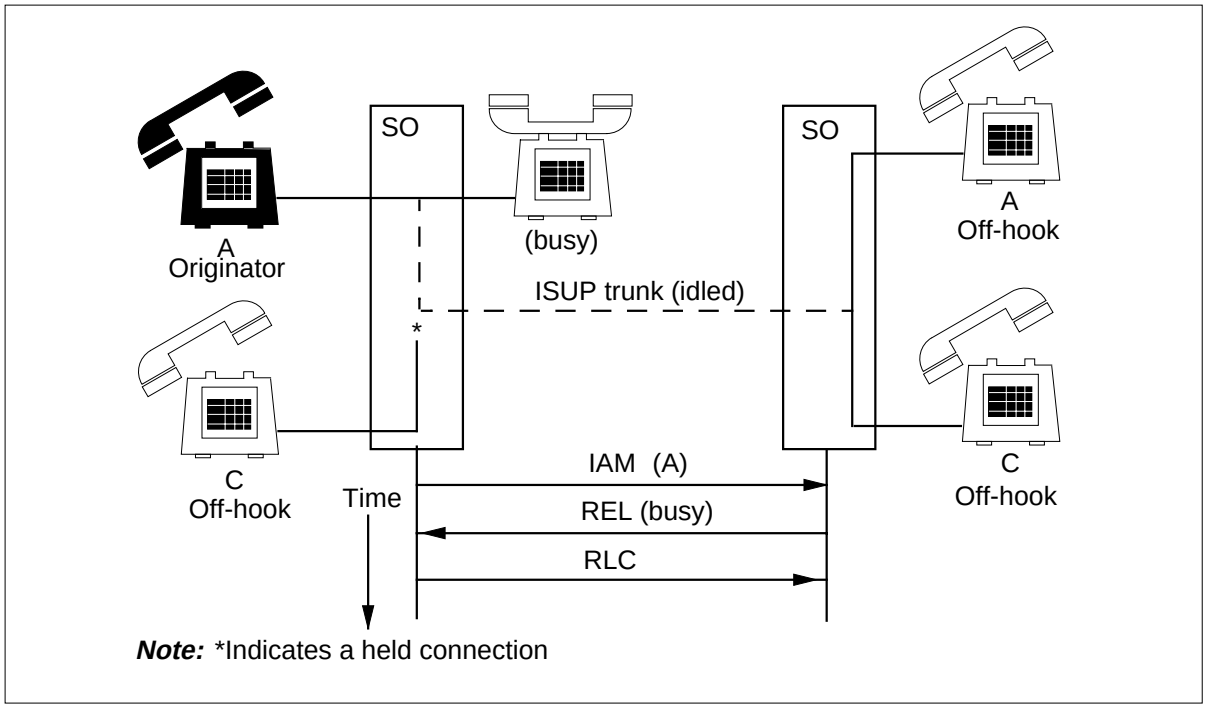
The following figure shows the results of a three-way call over an ISUP trunk to a busy party.

- A dials B.
- A activates 3WC and dials over an ISUP trunk to C.
- However, C is busy.

As in normal ISUP operation, a release (REL) message carries a cause indicator (busy) to the originating SO and a release complete (RLC) message is returned. The SO translates the cause indicator into a treatment (in this case, a busy signal), and the ISUP trunk is idled. (A LINE138 log is generated that indicates busy treatment came from Table TMTCNTL datafill.) The protocol messages indicate the point at which the busy treatment is returned to the originator. A is then permitted to conference and flash off the busy treatment.

ISUP/IBN Feature Interaction (continued)

ISUP trunk as the second leg of a three-way call with a busy party



ISUP trunk as a three-way call conferee

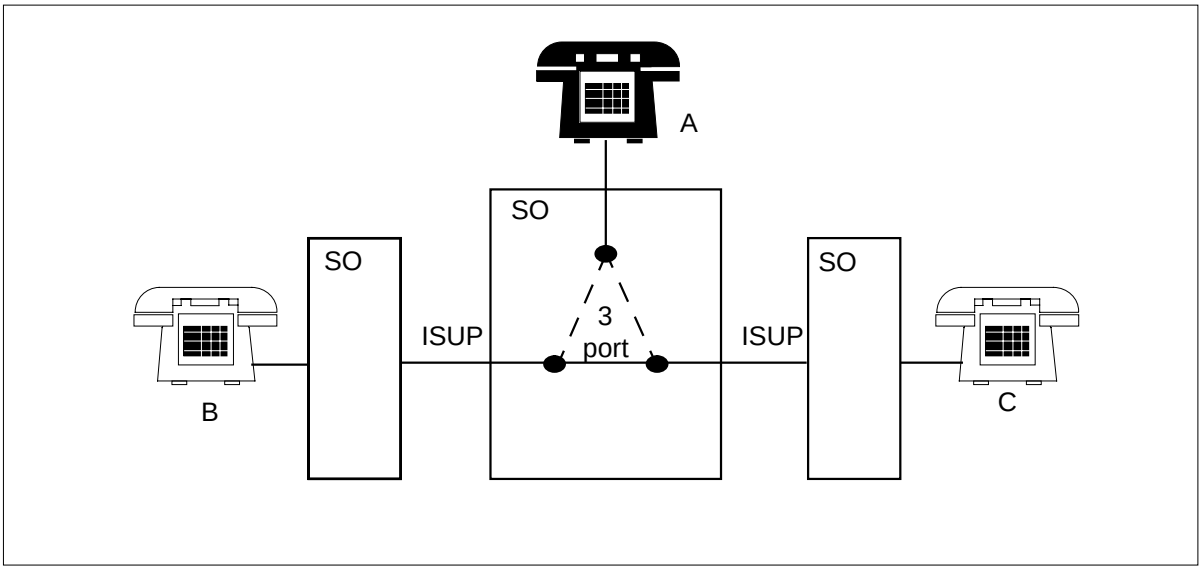
The following figure shows the ISUP trunk as a three-way call conferee. Two ISUP trunks are connected directly to a three-port conference circuit during a 3WC conference.

- A dials over an ISUP trunk to B.
- B answers.
- A activates 3WC and dials over an ISUP trunk to C.
- C answers.
- A conferences the call.

If either B or C goes on-hook, a REL message is sent to the SO that is controlling the conference. The three-way call would then be reconfigured as a two-party call. If B is a POTS line and goes on-hook, a SUS message is sent to the controlling SO. However, because the controlling SO is involved in a conference, the call is idled immediately with a REL message to B's SO.

ISUP/IBN Feature Interaction (continued)

ISUP trunk as a three-way call conferee



ISUP trunk as a three-way call conferee with GNCT treatment

The following figure shows the results of an ISUP trunk as a three-way call conferee with generalized no circuit (GNCT) treatment. The SO for C fails to route the call due to Network Blockage Heavy Traffic and, instead, returns a REL (no route) message.

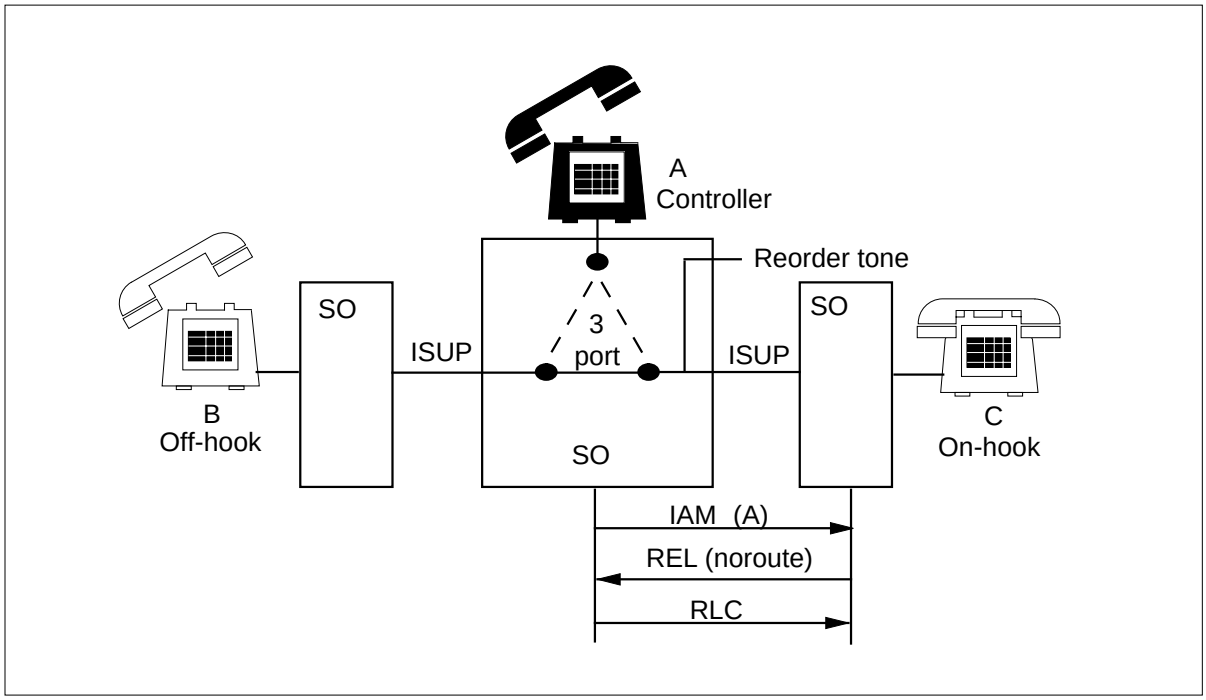
- A dials over an ISUP trunk to B.
- B answers.
- A activates 3WC and dials over an ISUP trunk to C.
- A immediately conferences the call.
- The SO for C fails to route the call due to Network Blockage Heavy Traffic.

The REL message cause indicator is translated into an appropriate treatment for an FTR138 log message. Because an FTR138 log is generated, the treatment is not taken from Table TRTMT. Instead, the conference hears five seconds of reorder tone. The conference controller (party A) may flash off the treatment before the five seconds expire. However, if the treatment times out, the call is reconfigured to a two-party call.

Field AGENT of the FTR138 log indicates the common language location identifier (CLLI) of the conference circuit to which the reorder tone is applied. Field TREATMENT SET indicates GNCT and field FEATURE is set to 3WC. Generation of an FTR138 log rather than a LINE138 log indicates that the treatment given to the conference call is not taken from Table TMTCNTL.

ISUP/IBN Feature Interaction (continued)

ISUP trunk as the second leg of a three-way call with GNCT treatment



Call Transfer

Call transfer of an ISUP trunk is permitted from either a 3WC consult state or a 3WC conference state provided that the party attempting the call transfer has that capability. If the 3WC controller does not have call transfer capability and attempts to transfer, a normal ringback will occur. Controller ringback applies only to consult calls. If the call has been in a conference before the call transfer is attempted, both legs of the 3WC are idled and no ringback occurs.

In some call transfer scenarios, transferring an ISUP trunk requires the insertion of a loop-back trunk. The loop-back trunk insertion occurs when the ISUP trunk is transferred to an AC.

Basic call transfer

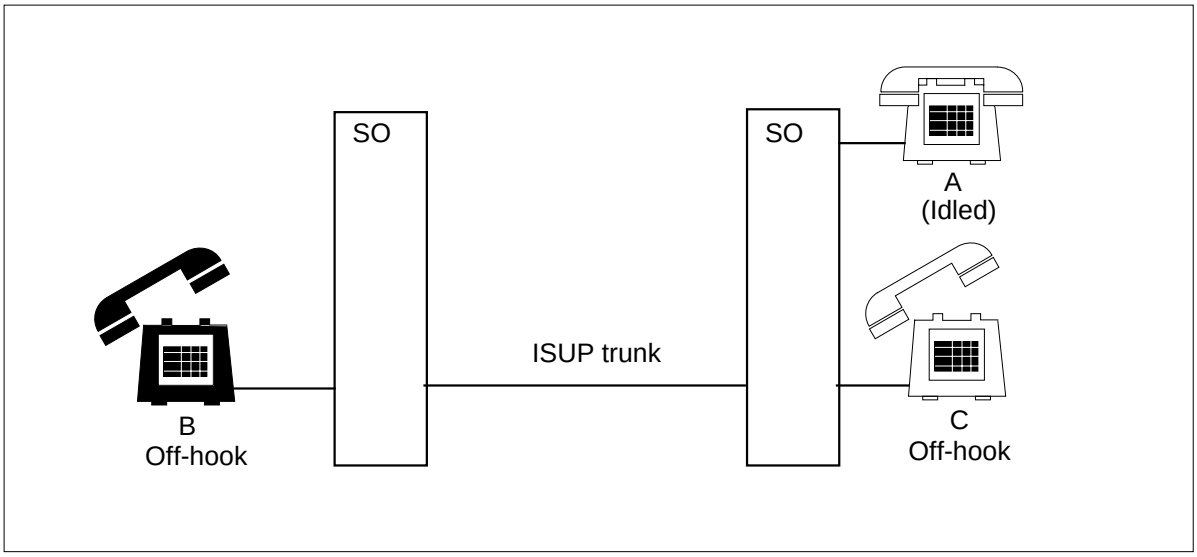
The following figure allows the 3WC controller to remove itself from the call and to allow the two remaining parties to talk. The following example depicts a basic call transfer. C may be either a line or a per trunk signaling (PTS) trunk.

- B calls A over an ISUP trunk.
- A answers and initiates a 3WC to C.
- C answers.

ISUP/IBN Feature Interaction (continued)

- A transfers B to C.
- A is idled; B and C are connected directly without need for a loop-back trunk.

Basic call transfer



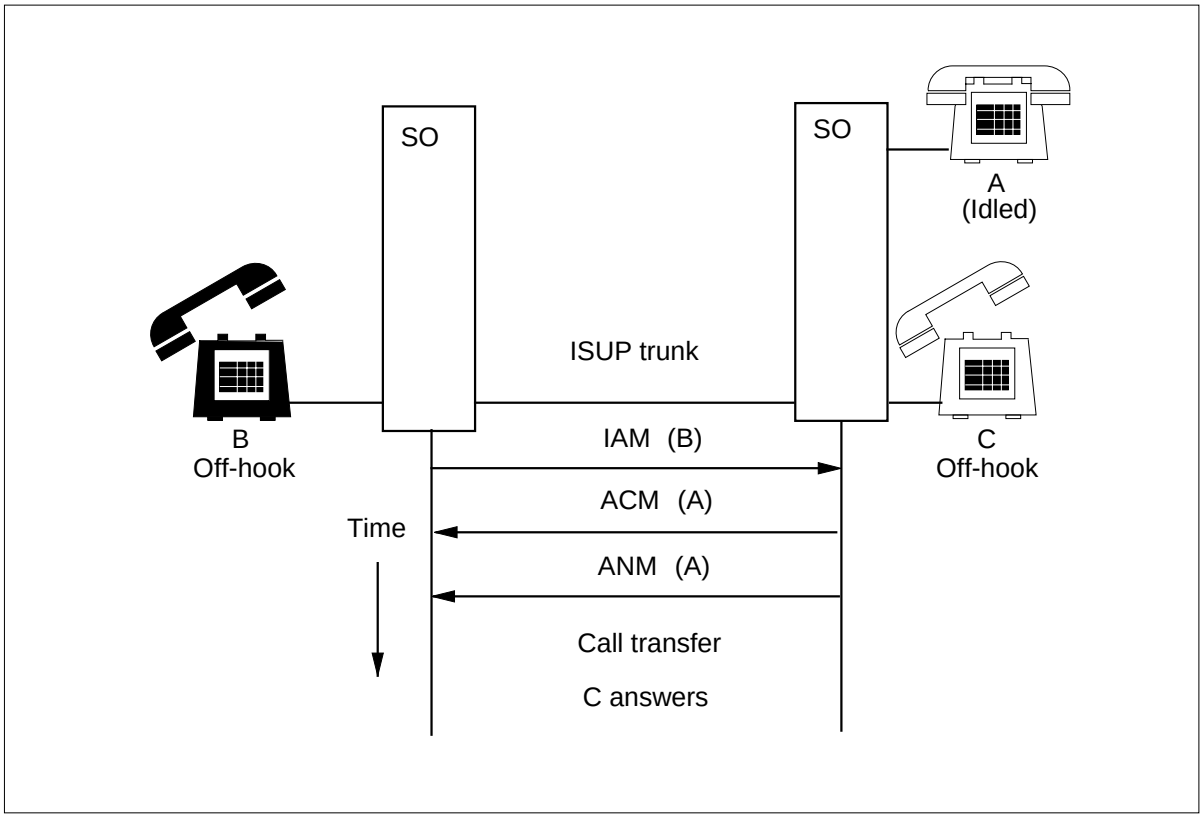
Call transfer of incoming ISUP trunk to a ringing line

The following figure depicts an incoming ISUP trunk that is transferred to a ringing line. The CCS7 protocol messages are those exchanged between B and A before the call transfer occurs. When A transfers B to C, B hears audible ringing until C answers. No protocol message is sent when C answers.

- B calls A over an ISUP trunk.
- A answers and initiates a three-way call to C.
- While C is ringing, A transfers B to C.
- C answers.

ISUP/IBN Feature Interaction (continued)

Call transfer of incoming ISUP trunk to ringing line



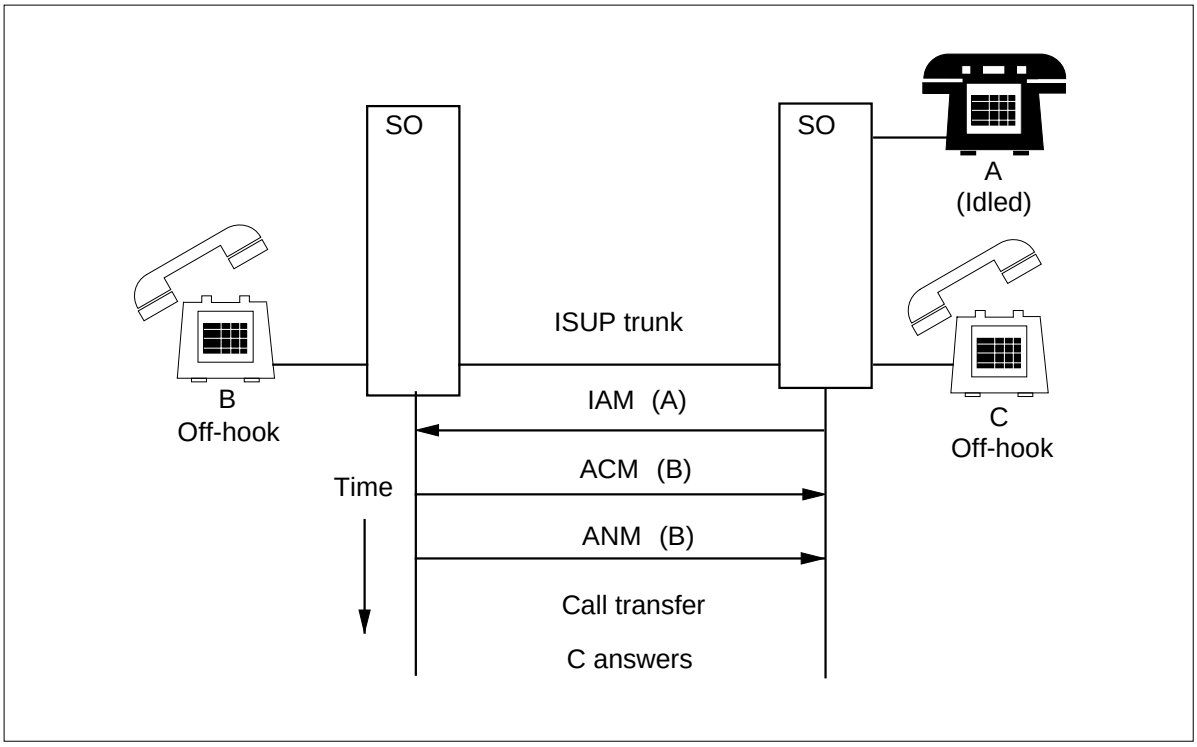
Call transfer of outgoing ISUP trunk to a ringing line

The following figure depicts an outgoing ISUP trunk that is transferred to a ringing line. The CCS7 protocol messages are those exchanged between B and A before the call transfer occurs. Note that the only difference in the outgoing and incoming ISUP protocol messages is their direction.

- A calls B over an ISUP trunk.
- B answers.
- A initiates a three-way call to C.
- While C is ringing, A transfers B to C.

ISUP/IBN Feature Interaction (continued)

Call transfer of outgoing ISUP trunk to ringing line



Call transfer of ISUP trunk to treatment

ISUP trunks may be transferred to treatments such as a busy signal or an announcement. When transferred to treatment, the ISUP call does not collapse. Because the treatment may have been conferenced and part of the message may already have been heard, treatment is applied at the service office in which the transfer occurred. (If the call had been collapsed and treatment applied at the originating office, a different announcement would likely be heard or none at all.) The following figure depicts a call transfer of a ISUP trunk to a treatment.

- B calls A over an ISUP trunk.
- A answers and initiates a three-way call to a blank directory number (DN).
- A transfers B to the announcement or tone.

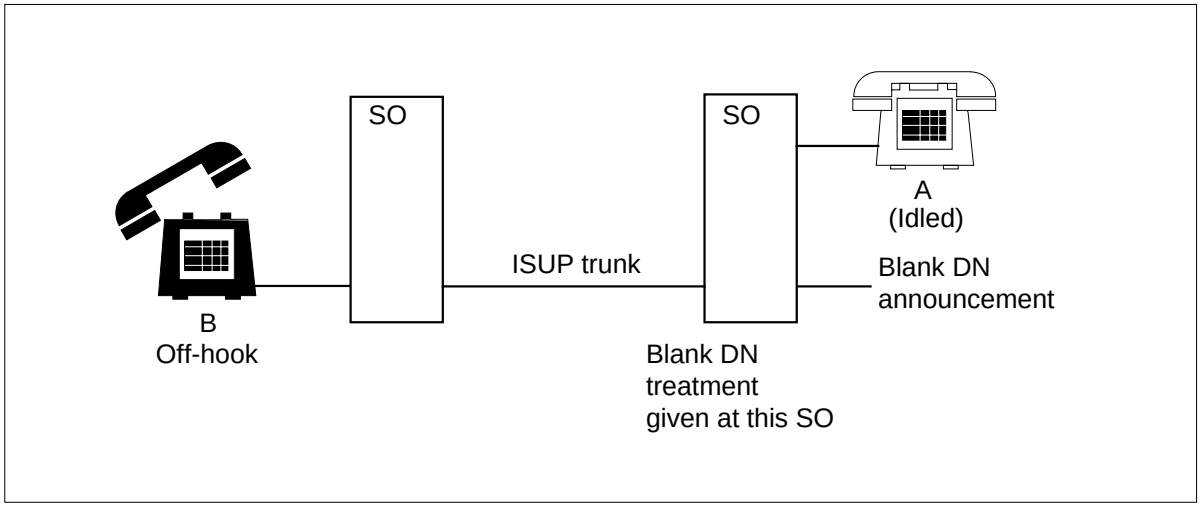
No message protocol is exchanged between SOs to indicate that the ISUP is receiving treatment. When the treatment is complete, a normal clearing REL message is sent to B's SO. If B goes on-hook before the treatment is complete, a REL message is sent to the A's SO and the call is idled.

Note that if A initiates the call to B (a POTS line) and then transfers to treatment, B subsequently goes on-hook and a SUS message is sent to A's SO.

ISUP/IBN Feature Interaction (continued)

However, no disconnect timing is given to B and the ISUP trunk is idled immediately with a normal clearing REL message to B's SO.

Call transfer of ISUP trunk to treatment



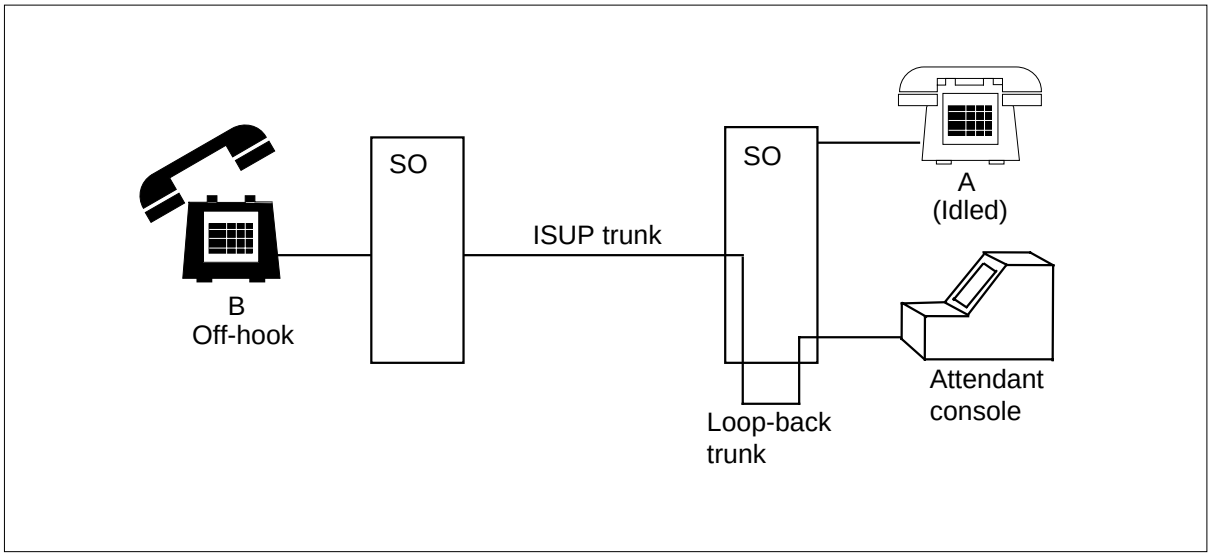
Call transfer of ISUP trunk to attendant console

When an ISUP trunk is transferred to an AC, a loop-back trunk is inserted at the time the transfer occurs. Direct interworking is used during 3WC consult with the attendant where the first leg is ISUP and while the three-way call is set up. The following figure depicts the employment of a loop-back trunk at the time of the transfer to the AC.

- B calls A over an ISUP trunk.
- A answers and initiates a three-way call to the attendant.
- A transfers B to the attendant.

ISUP/IBN Feature Interaction (continued)

Call transfer of ISUP trunk to AC



Call transfer to a line with an active feature

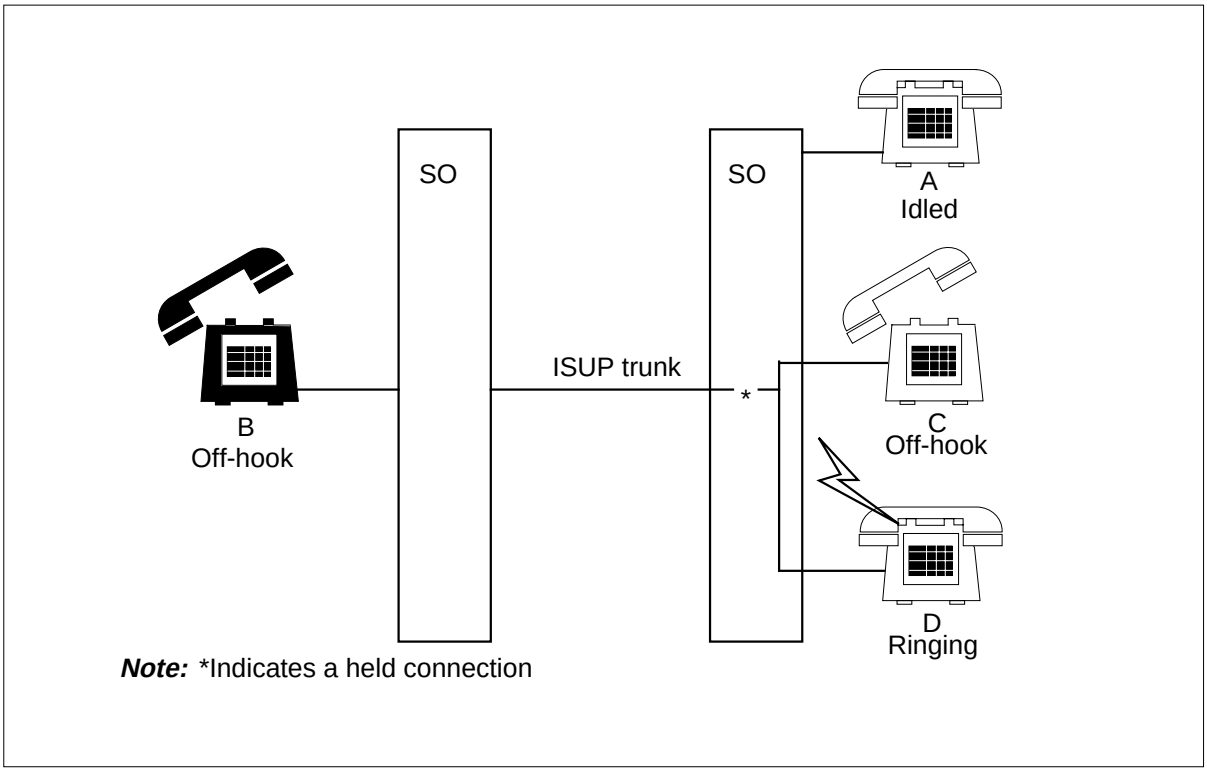
An ISUP trunk may be transferred to a line with an active feature. The following figure is an example of three-way call chaining. B has been transferred to C who has initiated a three-way call. The call configuration is the same as that when ISUP is the first leg of a three-way call. B hears a held tone.

Note that it is possible that C may have conferenced the three-way call before the transfer occurred. In that case, the ISUP trunk would be transferred directly to a three-port conference circuit, and the final configuration would look similar to that when ISUP trunk is a three-way call conferee.

- B dials over an ISUP trunk to A.
- A initiates a three-way call to C.
- C answers and initiates a three-way call to D.
- A transfers B to C.

ISUP/IBN Feature Interaction (continued)

Call transfer to a line with an active feature



The following features are compatible with direct ISUP interworking. These features can be active on a line to which an ISUP trunk is transferred, and direct ISUP interworking will take place.

- Three-Way Calling (3WC)
- Call Transfer
- Multiple Appearance Directory Number (MADN)
- Call Forwarding (CFX)
- Call Forward Busy (CFB)
- Call Forward Don't Answer (CFD)
- Universal Call Distribution (UCD)
- Automatic Call Distribution (ACD)
- Free Number Termination (FNT).

Note: Direct interworking to the FNT feature is not provided; a loop-back trunk is inserted. However, if an ISUP trunk is transferred to

ISUP/IBN Feature Interaction (continued)

a line with the FNT feature, a loop-back trunk is not employed, and direct interworking takes place.

Call transfer to ISUP trunk

In some cases, an ISUP trunk may be transferred to another ISUP trunk. In those cases, it is desirable that the trunks perform in tandem. Tandem operation allows ISUP end-to-end signaling. For example, information (INF) messages can be passed from one end office to another.

The following sections describe the four ISUP tandem configurations that are possible with call transfer. Each section discusses how the DMS tandem office handles ISUP protocol messages in a configuration.

Incoming ISUP trunk transferred to outgoing ISUP trunk

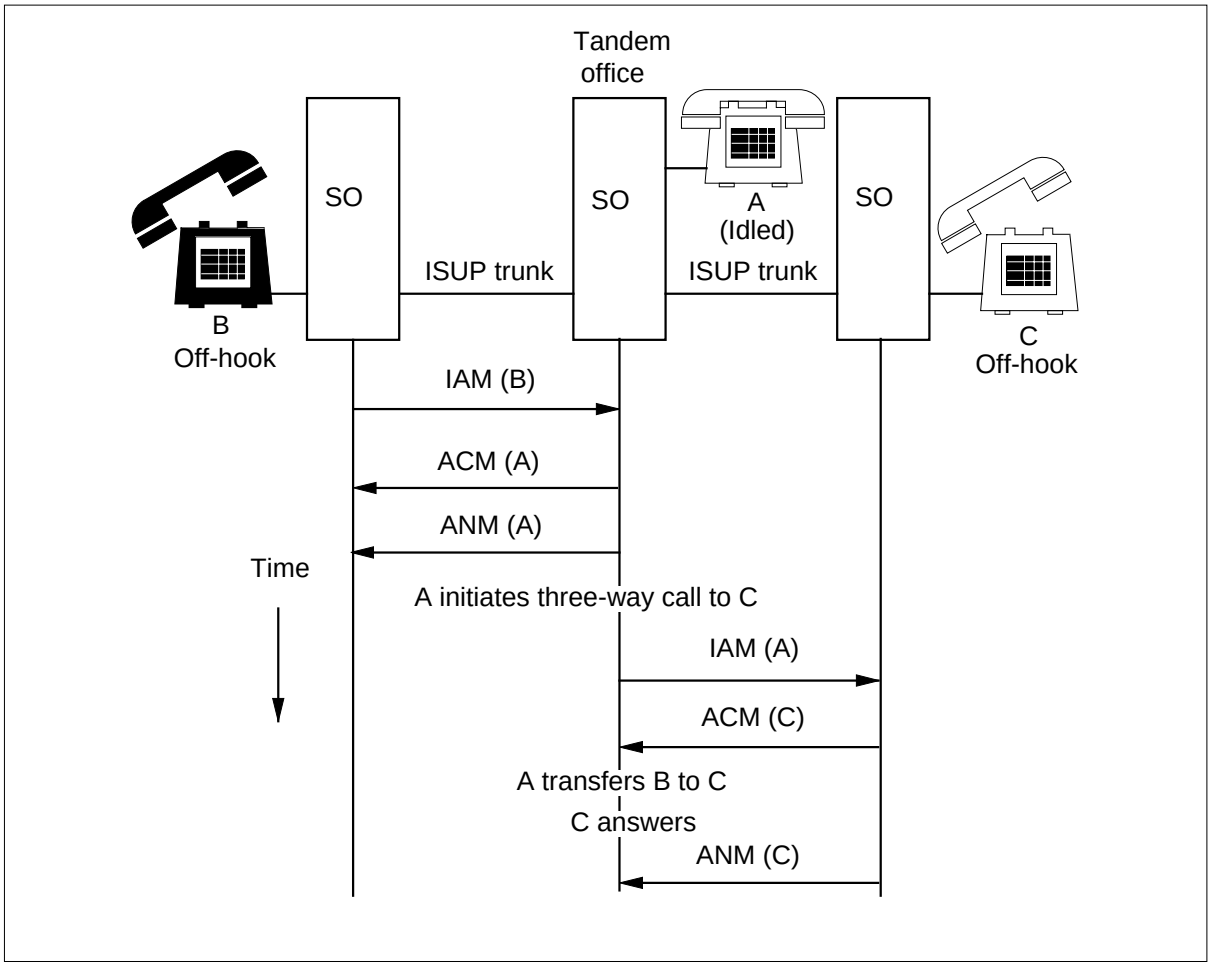
The following figure depicts an incoming ISUP trunk that is transferred to an outgoing ISUP trunk.

- B calls A over an ISUP trunk.
- A initiates a 3WC to C over an ISUP trunk.
- A transfers B to C.
- C answers.

In the following figure, A has transferred B to C before C answers. When C answers, the ANM is sent to the tandem office, but an ANM is not sent back to B's SO. Sending an ANM to B would constitute invalid protocol because B has already seen an ANM. No message is sent to B to indicate that the transfer has occurred.

ISUP/IBN Feature Interaction (continued)

Incoming ISUP trunk transferred to outgoing ISUP trunk



The following table shows how the DMS tandem handles ISUP protocol messages when incoming ISUP trunks are transferred to outgoing ISUP trunks.

Incoming ISUP to outgoing ISUP protocol handling (Sheet 1 of 2)

Message type	Tandem office action
ACM	An address complete message (ACM) indicates that the second leg of the 3WC transfer was set up successfully. This message is not sent to the originating exchange.
ANM	An answer message (ANM) indicates that the second leg of the 3WC transfer has been answered. Speech is connected. This message is not sent to the originating exchange.

ISUP/IBN Feature Interaction (continued)

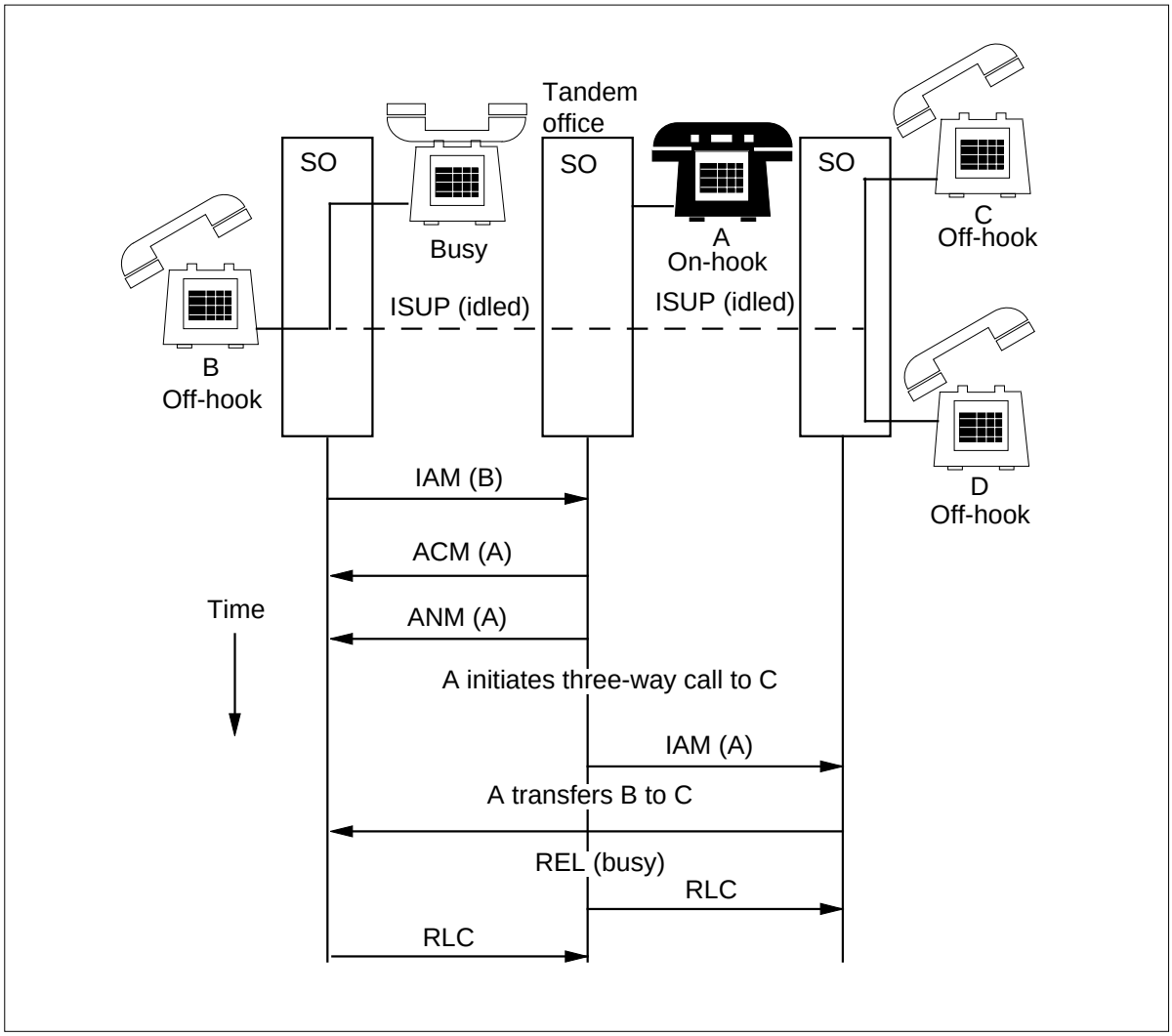
Incoming ISUP to outgoing ISUP protocol handling (Sheet 2 of 2)

Message type	Tandem office action
SUS	An ISUP suspend (SUS) message indicates that the terminator (plain old telephone service [POTS]) went on-hook. This message is passed to the originating exchange, and speech is disabled. Tandem sanity timing (TST) is started.
RES	An ISUP resume (RES) message indicates that the terminator went offhook. This message is passed to the originating exchange, and speech is enabled. TST is stopped at the tandem office.
REL	An ISUP release (REL) message from the originating/terminating exchange is passed to the terminating/originating exchange, and the associated ISUP trunk is idled. An RLC message is sent to the appropriate exchange.
RLC	A release complete (RLC) message indicates that the associated trunk has been idled at the far end and results in the idling of the ISUP trunk in the exchange receiving the RLC.
INF	Information (INF) messages are passed to the originating/terminating exchange as with normal tandem operations.

The following figure shows the protocol message scenario for an incoming ISUP trunk transferred to an outgoing ISUP trunk when the accessed line is busy. A has dialed C and immediately transferred B to C. Because C is busy, a REL (busy) message is returned to A. Because A has already transferred the call, the REL message is passed back to B where busy treatment is applied. The call only collapses back to B's SO if A transfers *before* the REL message is received by A's SO. If the transfer occurs *after* the REL message is received by A's SO, that SO provides the busy treatment and only the second leg of the three-way call collapses.

ISUP/IBN Feature Interaction (continued)

ISUP tandem to busy line



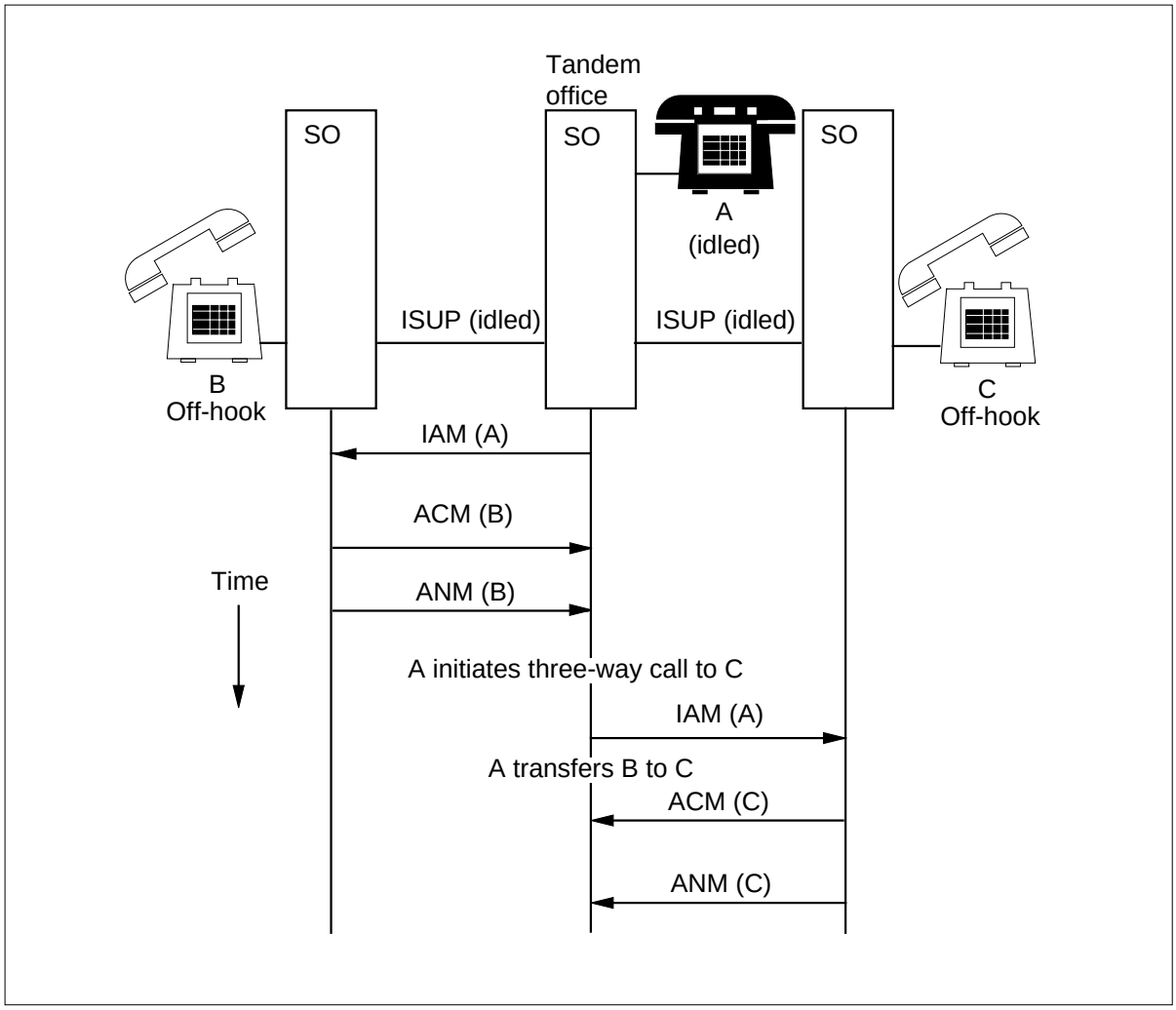
Outgoing ISUP trunk transferred to outgoing ISUP trunk

The following figure depicts the scenario for an outgoing ISUP that is transferred to another outgoing ISUP. Note that the ACM and ANM from C's SO are not relayed to B's SO.

- A calls B over an ISUP trunk.
- A initiates a three-way call to C over an ISUP trunk.
- A transfers B to C.

ISUP/IBN Feature Interaction (continued)

Outgoing ISUP trunk transferred to outgoing ISUP trunk



ISUP/IBN Feature Interaction (continued)

When outgoing ISUP trunks are transferred back-to-back, ISUP messages are handled differently at the tandem office. The following table describes how the ISUP protocol messages are handled.

Incoming ISUP to outgoing ISUP protocol handling

Message type	Tandem office action
ACM	An address complete message (ACM) indicates that the second leg of the 3WC transfer was set up successfully. This message is not sent to the originating exchange.
ANM	An answer message (ANM) indicates that the second leg of the 3WC transfer has been answered. Speech is connected. This message is not sent to the originating exchange.
SUS	An ISUP suspend (SUS) message indicates that the terminator (plain old telephone service [POTS]) went on-hook. This message is passed to the originating exchange, and speech is disabled. Tandem sanity timing (TST) is started.
RES	An ISUP resume (RES) message indicates that the terminator went offhook. This message is passed to the originating exchange, and speech is enabled. TST is stopped at the tandem office.
REL	An ISUP release (REL) message from the originating/terminating exchange is passed to the terminating/originating exchange, and the associated ISUP trunk is idled. An RLC message is sent to the appropriate exchange.
RLC	A release complete (RLC) message indicates that the associated trunk has been idled at the far end and results in the idling of the ISUP trunk in the exchange receiving the RLC.
INF	Information (INF) messages are passed to the originating/terminating exchange as with normal tandem operations.

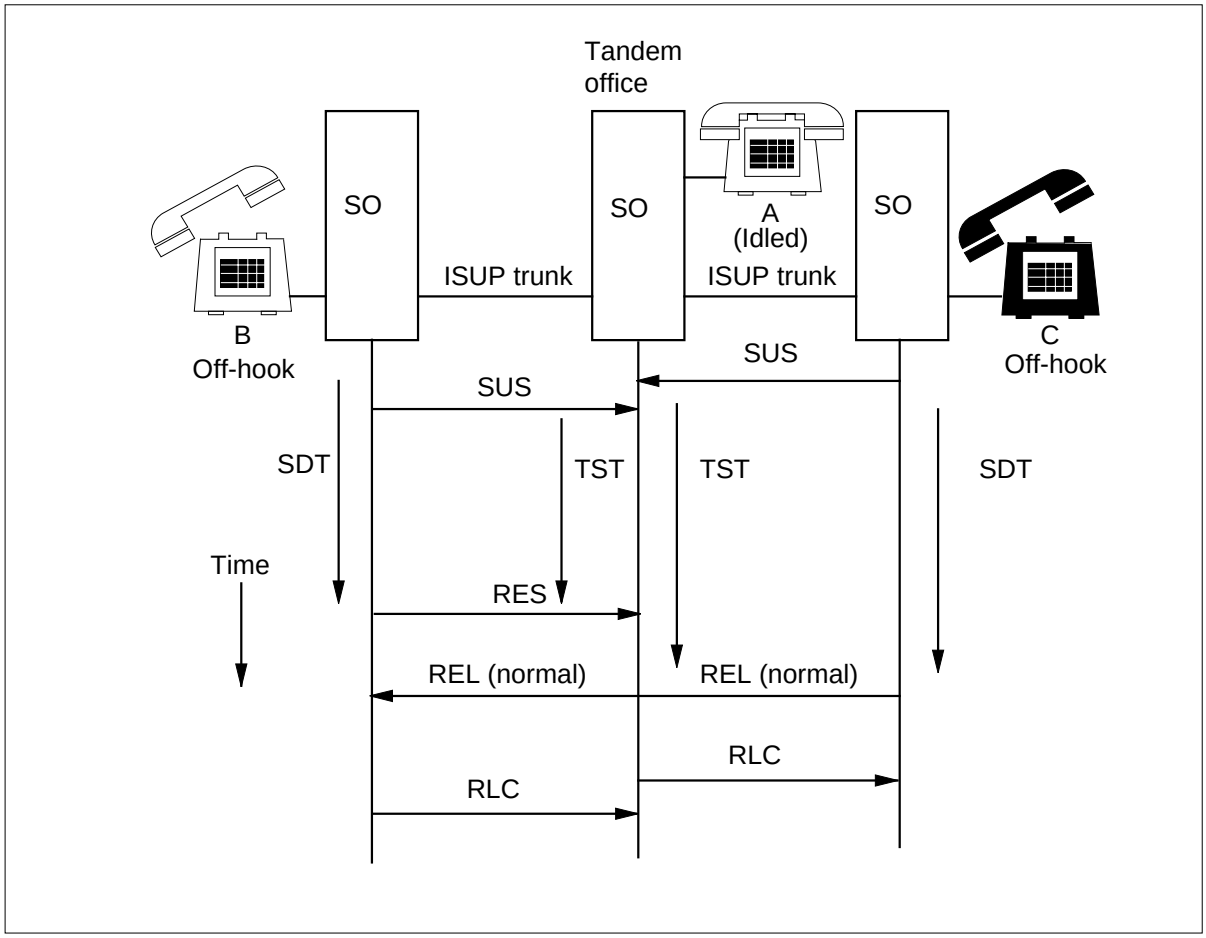
If either B or C goes on-hook, SDT is performed at the terminating SO and a SUS message is sent to the tandem office. The tandem office begins tandem sanity timing (TST) when it receives the SUS message. Before the SDT times out, the party that went on-hook may reaccess the call. If the party remains on-hook, a normal clearing REL message will be sent from the terminating office because TST is longer than SDT.

Note: The preceding explanation applies to POTS lines. If B or C are MDC lines, a normal clearing REL message is sent toward the tandem office and disconnect timing is not performed.

ISUP/IBN Feature Interaction (continued)

The following figure is a continuation of the back-to-back outgoing ISUP scenario and includes a disconnect (release). In the following figure, C went on-hook, which caused a SUS message to be sent to A's SO. B also went on-hook. Soon thereafter, B went off-hook resulting in a RES message. At that point, if C goes off-hook, speech is reconnected. However, C does not go off-hook. The SDT at C's SO expires, triggering a normal release message from C toward B. The remaining release sequence is as in normal REL operations.

Back-to-Back outgoing ISUP trunk with release



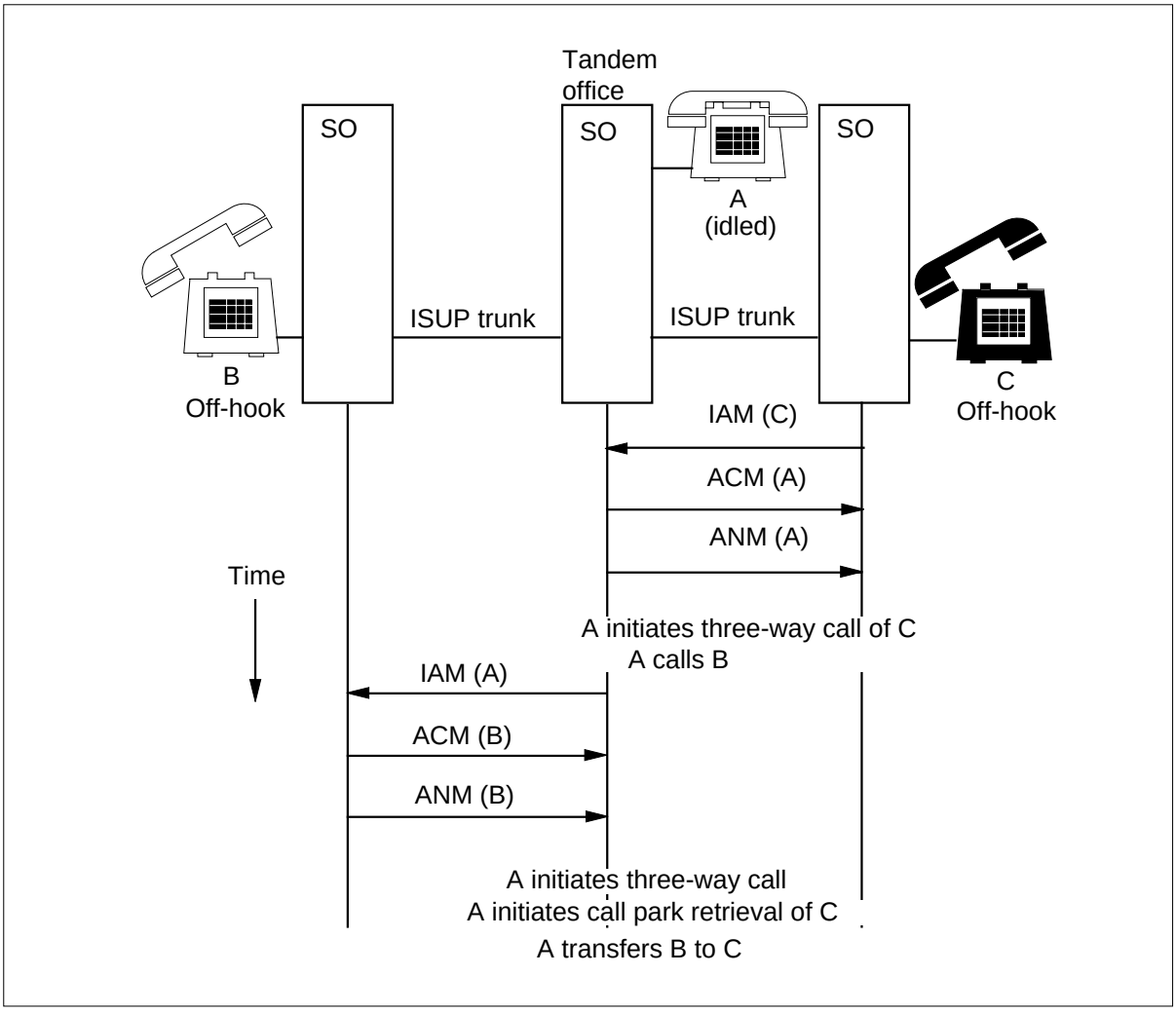
ISUP/IBN Feature Interaction (continued)

Outgoing ISUP trunk transferred to incoming ISUP trunk

The following figure depicts an ISUP outgoing trunk is transferred to an incoming ISUP trunk. Note that no protocol is sent to indicate that the call park or call transfer has occurred.

- C calls A over an ISUP trunk.
- A initiates call park of C.
- A calls B over an ISUP trunk.
- A initiates a three-way call.
- A initiates call park retrieval of C as second leg of three-way call.
- A transfers B to C.

Outgoing ISUP trunk transferred to ingoing ISUP trunk



ISUP/IBN Feature Interaction (continued)

The following table describes how the tandem office handles protocol messages when outgoing ISUP trunks are transferred to incoming ISUP trunks.

Outgoing ISUP to incoming ISUP protocol handling

Message type	Tandem office action
ACM	An address complete message (ACM) cannot be received by the tandem office in this configuration. If an ACM is received, it is ignored.
ANM	An answer message (ANM) cannot be received by the tandem office in this configuration. If an ANM is received, it is ignored.
SUS	An ISUP suspend (SUS) message is passed as in normal tandem operations. Speech is disconnected and tandem sanity timing (TST) is started.
RES	An ISUP resume (RES) message is passed as in normal tandem operations. Speech is reconnected and tandem sanity timing is cancelled.
REL	An ISUP release (REL) message is passed as in normal tandem operations. The associated ISUP trunk is idled.
RLC	A release complete (RLC) message indicates that the associated trunk has been idled at the far end and results in the idling of the ISUP trunk in the exchange receiving the RLC.
INF	Information (INF) messages are passed as in normal tandem operations.

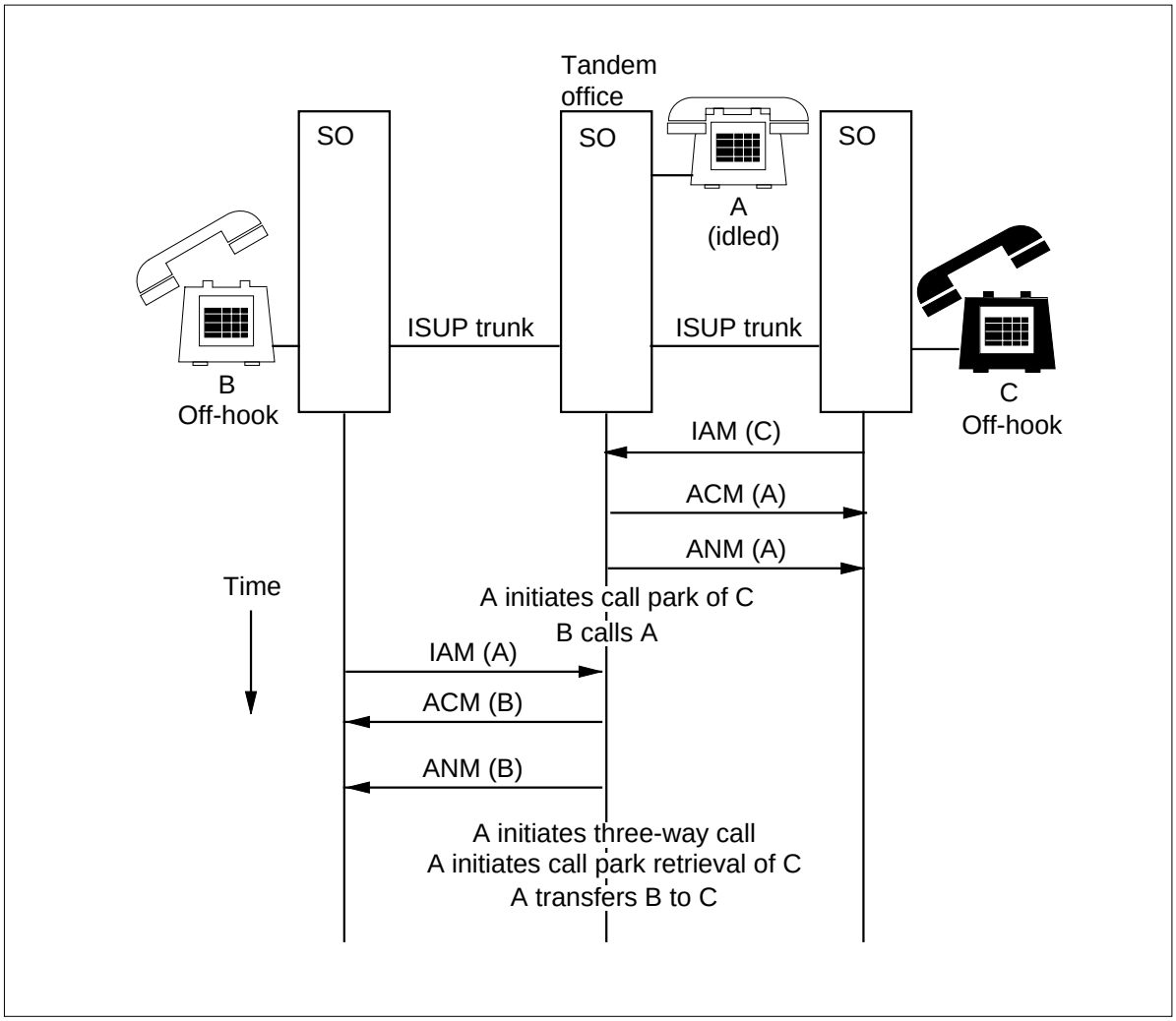
Incoming ISUP trunk transferred to incoming ISUP trunk

The interaction of Call Park and Call Transfer also allows two incoming ISUP trunks to be transferred together as depicted in the following figure. Note that no protocol is sent to indicate that the call park or call transfer has occurred.

- C calls A over an ISUP trunk.
- A initiates call park of C.
- B calls A over an ISUP trunk.
- A initiates a three-way call.
- A initiates call park retrieval of C as the second leg of the three-way call.
- A transfers B to C.

ISUP/IBN Feature Interaction (continued)

Incoming ISUP trunk transferred to incoming ISUP trunk



The following table describes how the tandem office handles protocol messages when incoming ISUP trunks are transferred to incoming ISUP trunks.

Incoming ISUP to outgoing ISUP protocol handling (Sheet 1 of 2)

Message type	Tandem office action
ACM	An address complete message (ACM) cannot be received by the tandem office in this configuration. If an ACM is received, it is ignored.
ANM	An answer message (ANM) cannot be received by the tandem office in this configuration. If an ANM is received, it is ignored.

ISUP/IBN Feature Interaction (continued)

Incoming ISUP to outgoing ISUP protocol handling (Sheet 2 of 2)

Message type	Tandem office action
SUS	An ISUP suspend (SUS) message cannot be received by the tandem office in this configuration. If a SUS message is received, it is considered as invalid protocol and the associate ISUP trunks are idled by REL call failure messages.
RES	An ISUP resume (RES) message cannot be received by the tandem office in this configuration. If an RES is received, it is ignored.
REL	An ISUP release (REL) message is passed as in normal tandem operations. The associated ISUP trunk is idled.
RLC	A release complete (RLC) message indicates that the associated trunk has been idled at the far end and results in the idling of the ISUP trunk in the exchange receiving the RLC.
INF	Information (INF) messages are passed as in normal tandem operations.

Call transfer to non-ISUP trunks

An ISUP trunk may also be transferred to non-ISUP trunks such as POTS or MDC lines. Because CCS7 messages are not included when ISUP trunks are transferred, the far end of the trunk may not be aware that the call is interworked. Other ISUP call characteristics, such as ISDN all the way, may also become invalid when a call is transferred to a non-ISUP trunk.

Executive Busy Override

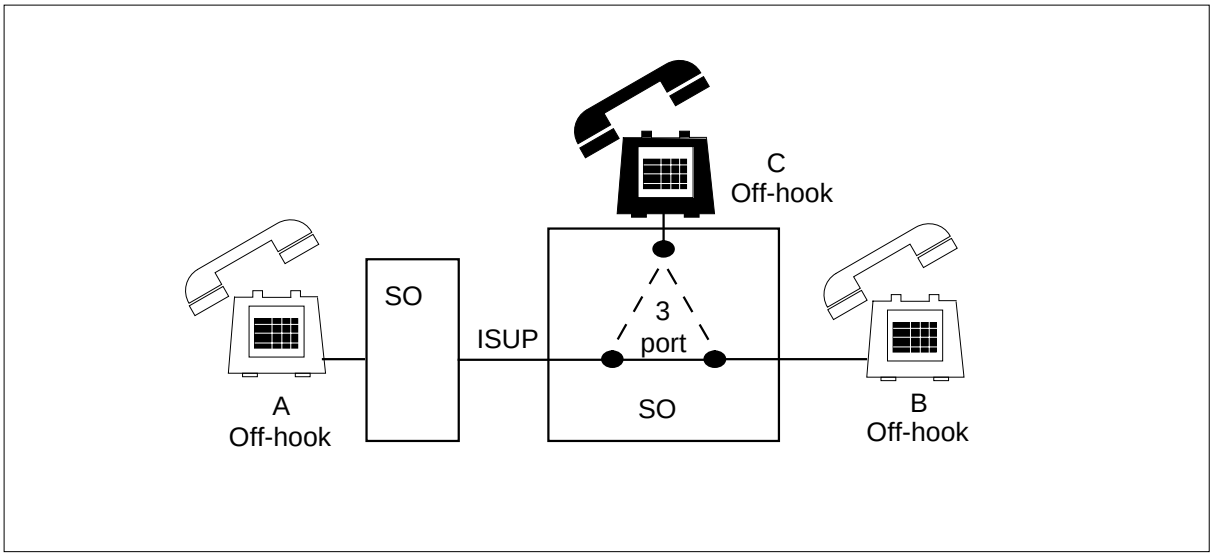
The Executive Busy Override (EBO) feature allows MDC lines to gain access to busy lines. The following figure depicts an EBO scenario with respect to an ISUP trunk.

- A dials over an ISUP trunk to B.
- C dials B and receives busy treatment.
- C activates EBO and a three-way conversation is established.

In the following figure, the three-way conversation is active. C has the option of releasing A by flashing, at which point, C and B are reconfigured as a two-party call. A normal clearing REL message is sent to A's SO, and the ISUP trunk is idled. If A were to first go on-hook, a normal clearing REL message would be sent to C's SO, at which point C and B would again be reconfigured as a two-party call. If B were to go on-hook, all parties would be idled and a normal clearing REL message would be sent to A's SO.

ISUP/IBN Feature Interaction (continued)

ISUP trunk as a three-way call conferee with GNCT treatment



Directed Call Pickup

Directed Call Pickup (DCPU) allows MDC lines to pick up (answer) other ringing MDC lines. When the call pickup occurs, a two-party call is established between the ISUP trunk and C according to the following scenario.

- A dials over an ISUP trunk to B.
- C goes off-hook and dials the DCPU access code.
- C dials the directory number of B.
- C talks to A.

Directed Call Pickup - Barge In

Directed Call Pickup - Barge In (DCBI) is activated in the same manner as DCPU. With DCBI, however, if the call that was intended to be picked up has already been answered, a three-way conversation is established. The three-way call is similar to EBO. However, the party that activates DCBI cannot flash off the incoming ISUP trunk. If any party releases, the call is reconfigured into a two-party call with the remaining parties.

The following sections describe the basic functions of the various CCS7 protocol messages that apply to ISUP/IBN Feature Interaction III (3WC, EBO, DCPU).

Address complete messages

ACMs are sent in the reverse direction. The ACM indicates that all of the address signals that are required for routing the call to the called party have been received. (An ACM may not be sent to the originating exchange if an

ISUP/IBN Feature Interaction (continued)

immediate connection to the called party is made. In this case, only an ANM would be sent.)

The ACM contains the following parameters:

- message type
- backward call indicators
- connected party number (optional).

Answer messages

ANMs are sent in the reverse direction to indicate that the call has been answered. The ANM contains the following parameters:

- message type
- backward call indicators
- connected party number (optional).

Initial address messages

IAMs are sent in the forward direction. The IAM initiates seizure of an outgoing circuit and transmits number and other information that relates to the routing and handling of a call. The IAM contains the following parameters:

- message type
- nature of connection indicators
- forward call indicators
- calling party category
- bearer capability
- called party number
- calling party number (optional)

Information messages

Information (INF) messages, although not presently used, may be used to relay information from one end office to another. The INF message contains the message type parameter.

Release messages

REL messages are sent in either direction to indicate that the circuit that is identified in the message is being released due to the cause supplied by the message. The message also indicates that the circuit is ready to be put in the

idle state upon receipt of the RLC message. The REL message contains the following parameters:

- message type
- cause indicators.

Resume messages

RES messages are sent to the originating exchange when the called party goes off-hook after previously going on-hook. The RES informs the originating exchange that the disconnect timer should be stopped and that the speech connection is to be remade. The RES message contains the following parameters:

- message type
- suspend/resume indicators.

Release complete messages

RLC messages are sent in either direction in response to the receipt of a REL. The RLC message contains the message type parameter.

Suspend messages

SUS messages are sent in either direction to indicate that the calling or called party has been temporarily disconnected. A SUS message is not sent to the originating exchange when an MDC line (including EBS) goes on-hook. A normal clearing REL message is sent instead. Furthermore, a SUS message that is received from an originating office will be interpreted as invalid protocol and the associated ISUP trunk will be idled. The SUS message contains the following parameters:

- message type
- suspend/resume indicators.

ISUP disconnect timing and suspend messages

The following sections describe disconnect timing and suspend message flow in ISUP trunks. (The suspend message flow that is involved in various feature interworking is detailed here because it is not covered in current CCS7 protocol documentation.)

Suspend message flow

Suspend messages are sent only from a terminating office toward an originating office when the DMS detects “terminator on hook." Suspend messages are generated only if the terminator is a POTS line (whether with or without POTS features). For MDC lines, including EBS, SUS messages are not generated when an on-hook is detected by the DMS. Instead, a normal clearing REL message is sent, and the call is idled immediately.

ISUP/IBN Feature Interaction (continued)

Note that this differs from the way PTS trunks handle disconnect timing for terminating MDC lines. On a call from a PTS trunk to an MDC line, if the terminating line goes on-hook first, the call does not come down until the originator either goes on-hook or the timed release disconnect (TRD) has timed out. On a call from an ISUP trunk to an MDC line, once the MDC terminator goes on-hook, the call comes down, and the line is free immediately.

When receiving a SUS message at the originating office, disconnect timing is initiated, provided that the originating line is a POTS or an MDC line (excluding EBS, whether with or without features). For EBS originators, disconnect timing is not initiated at the originating office. Instead, a normal clearing REL message is sent toward the terminating office when a SUS message is received.

Note: TRD timing does not apply to PRA trunks becasue PRA uses the IBN platform.

Suspend messages and feature interactions

The following table describes how suspend messages are handled by the DMS when calls with active features receive the messages.

Suspend message handling

Feature	Suspend message handling
Held calls	If a suspend (SUS) message is received while an ISUP trunk is being held, a normal clearing release (REL) message is sent to the terminating exchange, and the call is idled (for example, call hold, call park, three-way call consultation hold, station control consultation hold).
Conferenced calls	If a SUS message is received while an ISUP trunk is connected to a conference circuit, a normal clearing REL message is sent to the terminating exchange and the call is idled (for example, three-way call conferenced, station controlled conference, EBO three-way conversation).
Announcements	If a SUS message is received while an ISUP trunk is connected to an announcement, a normal clearing REL message is sent to the terminating exchange and the call is idled (for example, call transfer to treatment, ACD/UCD queuing).
Consult calls	If a SUS message is received while an ISUP trunk is on the consult leg of a three-way call and the 3WC controller is a POTS line, disconnect timing is initiated. Note, however, that if the call is conferenced while disconnect timing is being performed, a normal clearing REL message is sent to the terminating exchange, and the ISUP trunk is idled (for example, POTS 3WC).

ISUP/IBN Feature Interaction (continued)

ISUP trunk timer values

The following table describes the timers and timer values used when disconnect timing is to be performed for calls involving ISUP trunks (for example, a POTS line calls a POTS line over an ISUP trunk).

In the past, disconnect timing was not performed at an ISUP tandem office. Instead, TRD timing was undertaken by the originating office only. The ISUP/IBN Feature Interaction III feature improves tandem operation so that TST is performed at the tandem office. TST provides a safeguard that helps to prevent ISUP trunks from becoming hung up due to call failures at the originating office.

ISUP trunk timer values

Timer	Description
LTRD	Long timed release disconnect timer. The LTRD timer is started when a suspend (SUS) message is received at the originating office. When the time expires, a normal clearing release (REL) message is sent to the terminating office. The LTRD can be modified by updating the LONG_TIMED_RELEASE_DISC_TIME office parameter. The recommended setting is ten seconds.If this parameter is used to control the SUSpend timeout of ISDN User Part (ISUP) trunks, a value of 26 seconds or greater will not functionally propagate. The ISUP SUSpend timer is hard code limited to a maximum of 25.4 seconds. Datafilling LTRD with a value of 26 seconds or greater will result in a 25.4-second ISUP SUSpend message timeout.
SDT	Sanity disconnect timing. The SDT is set at the terminating office when a suspend message is sent toward the originating exchange. If the originating exchange fails to time the disconnect, the SDT expires. That sends a normal clearing REL message backwards to the originating office, which causes the successful idling of the ISUP trunk. The value of the SDT timer is set to LTRD + four seconds.
TST	Tandem sanity timing. For ISUP tandem calls, the tandem exchange starts the TST when a SUS message is received from the terminating exchange. If the originating and terminating exchanges fail to time the disconnect, the TST expires and results in the successful idling of the ISUP trunks involved in the call. Normal clearing REL messages are sent to both the originating and terminating exchanges when the TST expires. The value of the TST is set to LTRD + ten seconds.

Translations table flow

ISUP/IBN Feature Interaction does not affect translations table flow.

Limitations and restrictions

ISUP/IBN Feature Interaction has no limitations or restrictions.

ISUP/IBN Feature Interaction (end)

Interactions

ISUP/IBN Feature Interaction has no functionality interactions.

Activation/deactivation by the end user

ISUP/IBN Feature Interaction requires no activation or deactivation by the end user.

Billing

ISUP/IBN Feature Interaction does not affect billing.

Station Message Detail Recording

ISUP/IBN Feature Interaction does not affect Station Message Detail Recording.

Datafilling office parameters

ISUP/IBN Feature Interaction does not affect office parameters.

Datafill sequence

ISUP/IBN Feature Interaction does not affect datafill.

Translation verification tools

ISUP/IBN Feature Interaction does not use translation verification tools.

SERVORD

ISUP/IBN Feature Interaction does not use SERVORD.

Loopback Reduction for ISUP/AC

Ordering codes

Functional group ordering code: SS700001

Functionality ordering code: not applicable

Release applicability

BCS25 and up

Prerequisites

To operate, Loopback Reduction for ISUP/AC has the following prerequisites:

- BAS Generic, BAS00003
- TEL CCS7 Base, TEL00008
- MDC Standard, MDC00003

Description

Loopback Reduction for ISUP/AC limits the holding time of loop-back trunks on calls that involve Integrated Services Digital Network user part (ISUP) trunks and are extended by the attendant console (AC). The use of loop-back trunks provides direct interworking between ISUP trunks and those AC features for which direct interworking has not yet been fully implemented. With Loopback Reduction for ISUP/AC, loop-back trunks are used only when the attendant is actively involved in the call. The following types of calls are involved:

- ISUP trunk to AC calls
- AC to ISUP trunk calls
- ISUP trunk to direct inward system access (DISA) calls

Prior to this feature, the preceding types of calls required the insertion of a loop-back trunk during the terminating phase of the call to avoid direct interaction with the ISUP trunk. When the loop-back trunk was inserted in such calls, the loop-back remained associated with the call for the duration of the call.

Loopback Reduction for ISUP/AC allows calls involving an ISUP trunk and an AC to interwork directly as long as the attendant does not activate a feature that cannot yet interwork directly with ISUP trunks. If the attendant activates such a feature, a loop-back trunk is inserted only at that point to provide an interface between the ISUP and the console.

Loopback Reduction for ISUP/AC (continued)

Loopback Reduction for ISUP/AC also affects ISUP to DISA calls. Any loop-back trunk that is inserted in that type of call is removed after the authorization code and the called party digits have been dialed.

No attempt is made to remove a loop-back trunk that is inserted in a call after the call is released from the console. However, the number of loop-back trunks required to support calls involving ISUP trunks and ACs is substantially reduced because the most common instance, wherein an incoming call is merely extended and then released from the console, no longer requires a loop-back trunk.

Operation

The following paragraphs explain the overall functions of Loopback Reduction for ISUP/AC.

Console feature processing

During the processing of a console call in which an ISUP trunk is involved in either the source or the destination of the active loop, all AC key hits will be screened. The purpose of the screening is to determine whether the feature being requested by the AC is capable of direct interworking with an ISUP trunk.

For those features that are determined to be compatible with ISUP trunks, processing is allowed to resume normally. For features that are determined to be incompatible with ISUP trunks (not yet capable of direct interworking), a loop-back trunk is inserted between the ISUP and the AC. The loop-back insertion takes place before the feature is allowed to resume, thus avoiding the direct interaction of the feature with the ISUP trunk.

The following AC features are currently incompatible with ISUP trunks:

- Conference Hold
- Attendant Call Park

  Note: This feature supports only the retrieval of ISUP trunk calls that are parked by an attendant. Attendant retrieval of ISUP trunk calls that are parked by a station is not implemented by this feature.

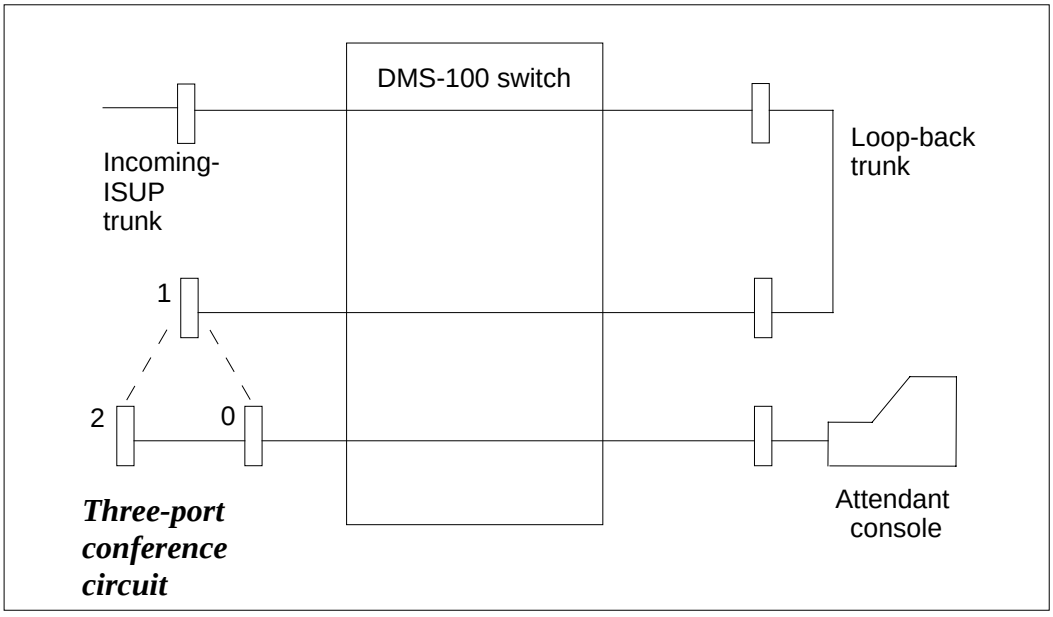
- End-to-End Signaling
- Code Call
- Call Transfer to Attendant

Loopback Reduction for ISUP/AC (continued)

Loop-back trunk insertion

When the attendant attempts to activate an incompatible feature, the software examines both the source and the destination of the active loop to determine the presence of an ISUP trunk. If an incoming ISUP trunk is found in the source, then a loop-back trunk is inserted between the ISUP trunk and the three-port conference circuit associated with the source. An extra network connection is established between the incoming ISUP trunk and the outgoing end of the loop-back trunk. The original network path connects the incoming end of the loop-back trunk with the source conference circuit port. The configuration of the network connections is shown in the following figure.

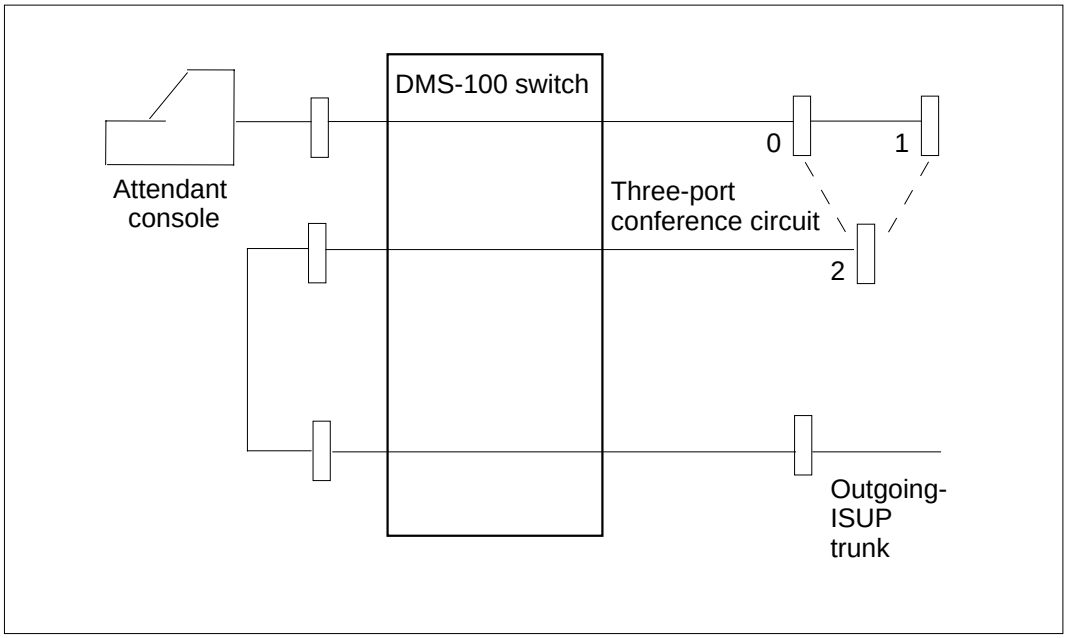
Insertion of a loop-back trunk on the active loop source



If an outgoing ISUP trunk is found in the destination, then a loop-back trunk is inserted between the three-port conference circuit associated with the destination and the ISUP trunk. An extra network connection is established between the incoming end of the loop-back trunk and the outgoing ISUP trunk. The original network path connects the destination conference circuit port with the outgoing end of the loop-back trunk. The configuration of the network connections is shown in the following figure.

Loopback Reduction for ISUP/AC (continued)

Insertion of a loop-back trunk on the active loop destination



In situations in which a loop-back trunk is not inserted either at the source or at the destination, an appropriate treatment is applied to the console, and the feature that is being attempted is denied. The appropriate treatment is based on the feature being activated. But, in most cases, treatment consists of the message TRY AGAIN, which will appear on the AC display. The call will be allowed to progress as though the feature activation were never attempted.

Failure to insert a loop-back trunk into the established AC call could be caused by any of the following reasons:

- no idle loop-back trunks available
- failure to obtain the second connection due to network blocking
- software failure due to a lack of resources

When a loop-back trunk is required on both the source and the destination, no attempt is made to remove the first loop-back trunk should the attempt to insert a second loop-back trunk fail. Also, after a loop-back trunk is inserted, the trunk remains with the call for the duration of the call even if it is released (floated) from the console.

Handling attendant held calls

Attendant hold allows the attendant to hold an agent in the active loop source or destination (or both) either by pressing the Hold (HOLD) key, by pressing

Loopback Reduction for ISUP/AC (continued)

another Loop key (auto hold), or by removing the headset from the jack on the console.

For most AC calls that involve ISUP trunks, the hold capability is provided directly. A loop-back trunk is not required. Such calls include those with an ISUP trunk in one port (either the source or destination) while the other port contains either no agent, another ISUP trunk, a line, or a standard per trunk signaling (PTS) trunk in the other port. For calls involving any other type of agent (such as a conference circuit), a loop-back trunk is required before the call can be placed on hold.

When a loop-back trunk is required but none are available, the attendant is unable to hold the call either by pressing the HOLD key or by pressing another Loop key.

Releasing calls from the attendant console

When the attendant attempts to release (float) a console call that contains parties in both the source and destination of the active loop, a loop-back trunk is still required. For most console calls that involve an ISUP trunk, the release capability is provided directly. A loop-back trunk is not required. Such calls include those with an ISUP trunk in one port (either the source or destination) while the other port contains either no agent, another ISUP trunk, a line, or a PTS trunk in the other port. For calls involving any other type of agent (such as a conference circuit), a loop-back trunk is required before the call can be released.

When a loop-back trunk is required but none are available, the attendant is unable to release the call by pressing the Release (RSL) key. The only alternative is for the attendant to release each party individually by using the Release Source (RLS SRC) and the Release Destination (RLS DEST) keys.

Call transfer to an attendant console

With Loopback Reduction for ISUP/AC, when an incoming ISUP trunk call is transferred to an AC, the call interworks directly with the console. However, if the call is placed on hold by the attendant while in a conference or consult mode before the actual transfer is made, a loop-back trunk is required.

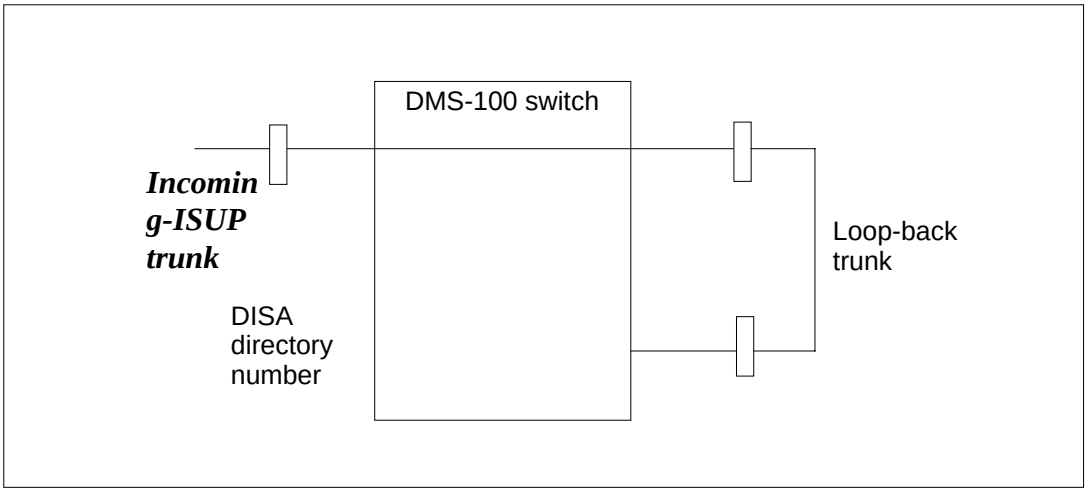
ISUP trunk and DISA interworking

Loopback Reduction for ISUP/AC also improves the interactions between ISUP trunks and Direct Inward System Access calls. The feature removes the loop-back trunk that is inserted in an ISUP trunk to DISA call after the authorization code and the called party digits have been dialed.

Loopback Reduction for ISUP/AC (continued)

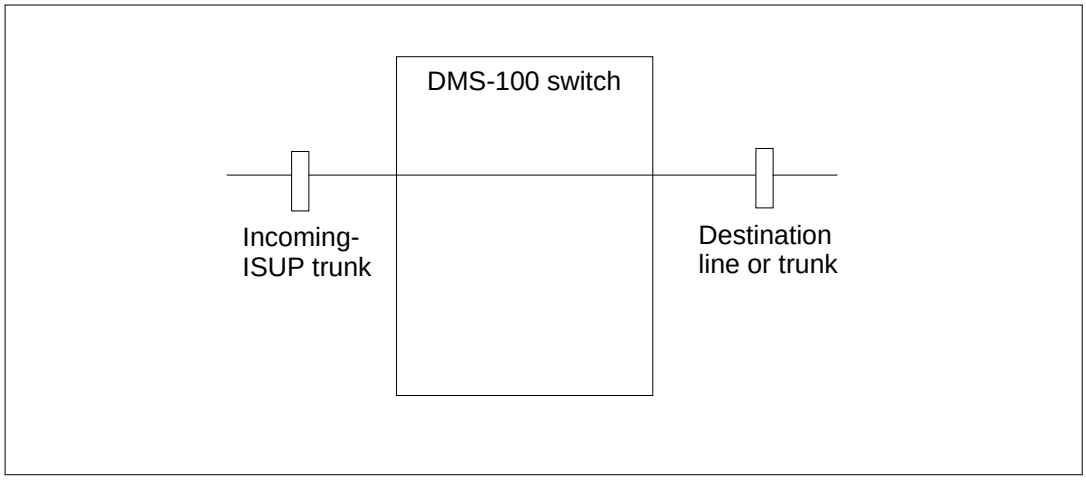
The following figure depicts the configuration of the dialing phase of an ISUP trunk to DISA call. Just prior to this point, a loop-back trunk was inserted to allow for digit collection. The loop-back trunk is required because neither dual-tone multifrequency (DTMF) nor universal tone receivers (UTR) are supported for ISUP trunks. The call is at the point where special dial tone is being given to the originator to allow the authorization code and called party digits to be dialed.

Dialing phase of ISUP trunk to DISA directory number call



The following figure depicts the terminating phase of the ISUP to DISA call. All of the digits have been dialed and the destination party has been reached. The loop-back trunk is no longer required and has been removed from the call and returned to the idle trunk queue.

Terminating phase of ISUP trunk to DISA directory number call



Loopback Reduction for ISUP/AC (end)

A sufficient number of loop-back trunks must be assigned to support the interworking of ACs and ISUP trunks. With Loopback Reduction for ISUP/AC, the number of loop-back trunks can be substantially reduced because they will only be required for calls in which specific, incompatible features are activated.

Translations table flow

Loopback Reduction for ISUP/AC does not affect translations table flow.

Limitations and restrictions

Loopback Reduction for ISUP/AC has no limitations or restrictions.

Interactions

This feature allows direct interworking between ISUP trunks and the AC only for features that are currently capable of direct interworking with ISUP trunks.

Activation/deactivation by the end user

Loopback Reduction for ISUP/AC requires no activation or deactivation by the end user.

Billing

Loopback Reduction for ISUP/AC does not affect billing.

Station Message Detail Recording

Loopback Reduction for ISUP/AC does not affect Station Message Detail Recording.

Datafilling office parameters

Loopback Reduction for ISUP/AC does not affect office parameters.

Datafill sequence

Loopback Reduction for ISUP/AC does not affect datafill.

Translation verification tools

Loopback Reduction for ISUP/AC does not use translation verification tools.

SERVORD

Loopback Reduction for ISUP/AC does not use SERVORD.

4 Introduction to ISDN User Part

Understanding ISDN User Part translations

This chapter provides information on datafilling ISDN User Part (ISUP).

Functional groups for ISUP

The ISUP functional group requires the DMS SuperNode Platform—BASE0001, TEL00001, and BAS00003. The following paragraph provides the functional group name, ordering code and additional prerequisites for ISUP.

ISUP Cellular, ISUP0001

To operate, ISUP Cellular requires SS7 Trunk Signaling, SS70001.

Cellular SS7 2A/2B Interface

Ordering codes

Functional group ordering code: ISUP0001

Functionality ordering code: not applicable

Release applicability

DMSCCM04 and up

Prerequisites

All the datafill information for this particular functionality is included in this document. However, prerequisite software or hardware may be required for complete implementation.

Description

The Cellular SS7 2A/2B Interface feature provides the wireless service provider (WSP) with the ability to connect with a DMS-100 switch equal access end office or DMS access tandem using a signaling system 7 (SS7) signaling protocol.

Operation

The Cellular SS7 2A/2B Interface feature provides an SS7 trunk interface between the local exchange carrier (LEC) and the WSP using GR-394 and GR-317 protocol. The feature produces originating and terminating billing records for calls initiated from or destined for the WSP network.

The trunk interfaces on which the SS7 protocol can be used to establish and release call connections include the Type 2A with an SS7 interface from a WSP to an access tandem, and Type 2B with an SS7 interface from a WSP to an end office. This feature does not support Type 2A with an SS7 interface from a WSP to a DMS-100 end office.

Cellular SS7 2A/2B Interface passes on all optional parameters in the ISDN user part (ISUP) message received from a wireless switching center (WSC) destined for an interexchange carrier (IXC), an international carrier (INC), and an LEC or another WSC office.

The SS7 interface gives the LEC and WSP the ability to provide more advanced services, including Calling Number Delivery, Calling Name Delivery, Automatic Call Back, Automatic Recall, and various call-rejection and call-acceptance features.

Cellular SS7 2A/2B Interface (continued)

Originating WSP call

Calls originating on or received by an LEC network from an IXC/INC or another LEC office and routed to a WSC network for final disposition are considered originating WSP calls.

Cellular SS7 2A/2B Interface generates a WSP-access automatic message accounting (AMA) record for all calls to the WSP network. Calls for which an Initial Address Message (IAM) has been sent to a WSC must generate an access record. The originating number field in the access record contains an assigned WSP billing number.

An originating WSP call on a Type 2A trunk generates an originating AMA record with call code 064 and structure code 0653. An originating WSP call on a Type 2B trunk generates an AMA record with call code 063 and structure code 0653.

Terminating WSP call

Calls received from a WSC that terminates on the LEC network, or calls routed to an IXC/INC for final disposition, are considered terminating WSP calls.

The Cellular SS7 2A/2B Interface feature generates a WS-access AMA record for all calls from the WSP network for which an IAM has been received from the WSC.

A terminating WSP call on a Type 2A trunk generates a terminating AMA record with call code 066 and structure code 0625. A terminating WSP call on a Type 2B trunk generates an AMA record with call code 065 and structure code 0625. The content of these billing records may be affected by feature ISUP Intermediate Tandem (IMT), AF7127.

Translations table flow

Cellular SS7 2A/2B Interface does not affect translations table flow.

Limitations and restrictions

Cellular SS7 2A/2B Interface does not support the Operator Services system.

There are interactions between WSP calls and various services in the DMS switch that could result in additional AMA records. If these interactions occur, the service feature field in the AMA records will comply with GR-1054 and G-1083 specifications.

Interactions

Cellular SS7 2A/2B Interface interacts with feature ISUP Intermediate Tandem (IMT), AF7127.

Cellular SS7 2A/2B Interface (continued)

Activation/deactivation by the end user

Cellular SS7 2A/2B Interface requires no activation or deactivation by the end user.

Billing

The Cellular SS7 2A/2B Interface feature generates a WSP-access AMA record for all calls to or from the WSP network. Calls for which an IAM has been sent to a WSC or received from a WSC generate an access record.

An originating WSP call on a Type 2A trunk generates an originating AMA record with call code 064 and structure code 0653. An originating WSP call on a Type 2B trunk generates an AMA record with call code 063 and structure code 0653.

A terminating WSP call on a Type 2A trunk generates a terminating AMA record with call code 066 and structure code 0625. A terminating WSP call on a Type 2B trunk generates an AMA record with call code 065 and structure code 0625.

Station Message Detail Recording

Cellular SS7 2A/2B Interface does not affect Station Message Detail Recording.

Datafilling office parameters

Cellular SS7 2A/2B Interface does not affect office parameters.

Datafill sequence

The following table lists the table that requires datafill to implement Cellular SS7 2A/2B Interface.

Datafill table required for Cellular SS7 2A/2B Interface

Table	Purpose of table
TRKGRP	Trunk Group. This table contains operating company-defined data associated with each trunk group that exists in the switching unit.

Datafilling table TRKGRP

Subfield OPTION must be updated for incoming intertoll, outgoing intertoll, and two-way intertoll.

The following table shows the datafill specific to Cellular SS7 2A/2B Interface for table TRKGRP. Only those fields that apply directly to Cellular SS7 2A/2B

Cellular SS7 2A/2B Interface (continued)

Interface are shown. For a description of the other fields, refer to the data schema section of this document.

Datafilling table TRKGRP

Field	Subfield or refinement	Entry	Explanation and action
GRPINFO		see subfield	Variable group data. This field consists of several subfields. Only subfield OPTIONS pertains to this feature.
	OPTIONS	see subfield	Options. Datafill subfield OPTION and the corresponding refinements for the desired trunk option.
	OPTION	BILLNO or CELL	Option. This subfield consists of refinements BILLNO and CELL. To specify the billing number, enter BILLNO. To enter the configuration of the intertoll trunk type, enter CELL.
	BILLNO	up to an 11-digit billing number	Billing number. If the entry in subfield OPTION is BILLNO, enter the digit billing number that is used to populate the originating number field in the cellular mobile carrier (CMC) AMA record and the associated equal access AMA record.
	CELL	2A ,2B, or NILCELL	Cell. If the entry in subfield OPTION is CELL, enter the configuration of the Intertoll trunk type. Datafilling this option as 2A indicates that the intertoll trunk is configured as a CELL Type 2A SS7 trunk. Datafilling this option as 2B indicates that the Intertoll trunk is configured as a CELL Type 2B SS7 trunk.

Datafill example for table TRKGRP

The following example shows sample datafill for table TRKGRP.

Cellular SS7 2A/2B Interface (end)

MAP display example for table TRKGRP

```
GRPKEY
                                          GRPINFO
_____________________________________________________________

SUP2WITEA
    IT 0 ELO NCRT 2W NIL MIDL 519 PEA NSCR 919
    000 N N (BILLNO 9198480833) (CELL 2A)$

SUP2WITEB
    IT 0 ELO NCRT 2W NIL MIDL 519 PEA NSCR 919
   000 N N (BILLNO 9198480835) (CELL 2B)$
```

Translation verification tools

Cellular SS7 2A/2B Interface does not affect translation verification tools.

SERVORD

Cellular SS7 2A/2B Interface does not use SERVORD.

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SS7 Datafill

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