

Expanded Carrier Identification Code Planner for Feature Group D

After the Modified Final Judgment, Northern Telecom applied advanced digital technologies to meet initial Equal Access requirements. Now, while the industry prepares to change the dialing format for Carrier Identification Codes, Northern Telecom stands ready to meet the next major step in the evolution of the network.

At the time of the MFJ, few analysts predicted there would be as many carriers across the United States as appear today. The present administration of Carrier Access Codes (CACs) permits no more than 970 different common carriers across the network. At the rate the public network adds new carriers each year, the supply of available Carrier Identification Codes (CICs) will be exhausted well before the end of the decade.

To expand the number of CICs-and to provide greater numbering flexibility-Bellcore, the Industry Carrier Compatibility Forum, and the Federal Communications Commission have developed a phased plan to increase the supply of CIC assignments. Northern Telecom is following these guidelines to enhance the implementation of expanded Equal Access codes, with a phased rollout as detailed in this document.

This document provides an advance planning overview of how the CIC expansion plan impacts the DMS-100/DMS-200 Family. This information will help network planners and others to streamline planning for Equal Access implementation.

EQUAL ACCESS TODAY

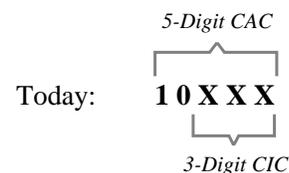
The Equal Access plan caused by divestiture allows a telephone subscriber to designate which common carrier will complete a long distance call. This may be done by presubscription-by designating a single carrier as a subscriber's Primary InterLATA Carrier (PIC)-or by dialing a Carrier Access Code (CAC) on a per-call basis. The plan to expand Carrier Identification Codes impacts both presubscription and the CAC a subscriber dials.

The portion of the dialable CAC that identifies a particular common carrier is called the Carrier Identification Code (CIC). Each carrier has its own unique code throughout the public network. Currently for Feature Group D, the CIC is limited to three digits, so potentially a maximum of 1,000 carriers could be assigned. Actually, because of thirty reserved numbers, the present CIC format accommodates a maximum of 970 carriers. At the current rate of allocation, all the available CICs will be depleted in the near future.

Feature Group D Carrier Identification Code Expansion

A subscriber designates a single common carrier to route a particular call by dialing:

- *a Carrier Access Code (CAC) that contains*
- *a Carrier Identification Code (CIC)*



Today's CAC/CIC dialing formats can identify a maximum of 970 different carriers (series 10X, 15X, and 16X are unassigned).

EQUAL ACCESS IN 1994 AND BEYOND

To accommodate a greater number of carriers in the network, and for greater numbering flexibility, the industry will undertake three major changes:

- Feature Group B codes (of the type 950WXXX) expand from three to four digits and are administered separately from Feature Group D codes. This change is already in progress.
- In Feature Group D (FGD), the CIC portion of a CAC expands from three to four digits, to accommodate as many as 10,000 carriers.
- The overall FGD CAC format increases from five digits (10XXX) to seven digits (101XXXX).

In a Phased Rollout

Because a nationwide “flash” cutover to the new dialable formats is not feasible, Bellcore has outlined a phased plan that organizes incremental changes, discussed in this document:

- ▶ **Permissive Dialing period** introduces the new formats on a node pair basis. During this period the network will accommodate both new and existing CIC/CAC formats.
- ▶ **Final Conversion period** ends the existing dialing formats and allows the new four-digit CIC and seven-digit CAC usage only.

TRANSITION PLAN

Northern Telecom is providing the base changes in the DMS system software to follow the phased plan for FGD CIC Expansion as detailed in Bellcore’s TR-NWT-0011050 (TR-1050) and other documents. This software-only solution has been designed with time-saving features to minimize the amount of translation updates required. Generally, out-of-service time is limited to resetting Extended Peripheral Modules after a change to one office parameter.

AVAILABILITY

Base Translations, Multifrequency Trunk Outpulsing, and other fundamental features for CIC expansion are generally available now, with BCS35. FGD CIC Expansion support for Enhanced 800 Service, Private Virtual Networks, Equal Access Alternate Switching Point, and Cellular Type 2A Interconnect is scheduled to be generally available by April 1994 with BCS36. Support for FGD CIC Expansion in TOPS and LATA Equal Access System (LEAS) offices is scheduled to be generally available with BCS37 and be bridged back into BCS36 stream by April 1994. Refer to Section 1.7, *Availability*, for greater details on feature rollout.

FURTHER INFORMATION

This document is for advance planning purposes. It supplements, rather than replaces, the more detailed provisioning, engineering, administration, and maintenance information available in *Northern Telecom Publications* (NTPs). For greater details about Equal Access in existing DMS-100 Family software releases, refer to NTPs in the 297-1001 and 297-2101 series. CIC Expansion is already complete for the DMS-10 Family, described in 297-3401-105. These publications can be ordered by calling 1-800-347-4850 (option 2).

Feature Group D Carrier Identification Code Expansion

The expansion plan permits identification of up to 10,000 different carriers -by enlarging the CAC/CIC dialing formats.

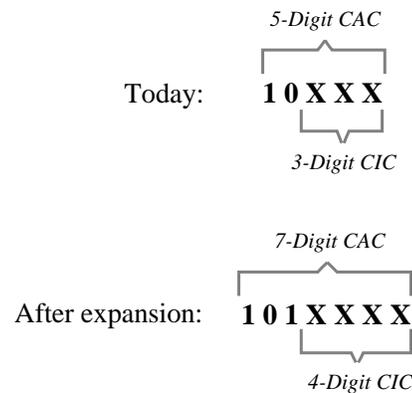


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1.0 Network Transition Plan

Summary of the Changes Involved

This section summarizes the impact the Feature Group D (FGD) Carrier Identification Code (CIC) Expansion plan will have on the industry and lists the software Northern Telecom plans to release to meet the requirements of the plan.

1.1 INTRODUCTION

Today, a subscriber can designate a particular common carrier to transport interLATA calls by dialing a five-digit Carrier Access Code (CAC), or by presubscription to a particular carrier as a Primary InterLATA Carrier (PIC). The last portion of a CAC or a PIC is a three-digit Carrier Identification Code (CIC) that identifies a particular carrier. The present administration of CICs will lead in the near future to the depletion of these codes.

To expand the number of assignable CICs-from the present limit of 970 up to a maximum of 10,000-the industry will implement three changes across the network:

- Expand and administer separately the codes in Feature Group B. Section 1.2 discusses this change that is already in progress.
- Increase the number of digits for the Feature Group D (FGD) CIC format from three to four digits. Section 1.3 discusses this upcoming change.
- Increase the number of digits for the FGD CAC format from five to seven digits. Section 1.4 discusses this upcoming change.

Northern Telecom is providing the software necessary to meet these changes, following the phased rollout detailed by Bellcore in TR-NWT-001050. Section 1.5 discusses these planned transitions.

1.2 FGD CHANGES FOLLOW FGB EXPANSION

Feature Group B (FGB) CIC Expansion is already complete. Presently either three- or four-digit CICs are assigned and dialed on an office-wide basis. The full CAC is either 950-WXXX for three-digit CIC offices (where W may be a zero or 1) or 950-XXXX for offices with four-digit CICs. The expansion plan for FGD CICs follows a similar implementation plan. Also, some software changes made to accommodate the FGB CIC Expansion-such as changes to AMA (Automatic Message Accounting) records-are already in place or are easily converted to suit the FGD CIC Expansion.

Another change to FGB codes that impacts FGD CIC Expansion is a new practice of administering FGB and FGD codes separately. Previously, the two feature groups were administered jointly (each carrier received a CIC code from both groups). Now, the same numerical code can be assigned to two different carriers, one for FGB only and one for FGD only (if a carrier requests both FGB and FGD applications, it will not necessarily be given the same numerical code from each group). Separate feature group code administration will significantly conserve and recover overall CIC capacity.

1.3 EXPAND FORMAT OF FGD CICs

The dialable format of FGD CICs expands from three to four digits. This allows up to a maximum of 10,000 different carriers to be identified uniformly across the network.

An existing common carrier, currently operating in the network, retains its current three-digit CIC—the addition of a leading zero expands the code to four digits. For example, a common carrier with the CIC of 999 will be identified in the new format as 0999.

When all codes in the 0XXX series have been assigned, then new CICs will be assigned in the 5XXX and 6XXX series only (for a limited “permissive dialing” period). Also during this period, no assignments will be made in the 10X, 15X, and 16X series (to date no three-digit FGD CIC assignments have been made for these thirty reserved numbers). At the end of the permissive dialing period, then all digits from 0000 to 9999 can be used for common carrier identification.

1.4 EXPAND FORMAT OF FGD CACs

The dialable format of FGD CACs expands from five to seven digits. The current CAC format is 10XXX (where XXX is a three-digit CIC). The new CAC format will be 101XXXX (where XXXX is a four-digit CIC).

During the planned permissive dialing period, switches will be able to process both five-digit CACs (of the form 10XXX—excluding 1010X, 1015X, and 1016X) and seven-digit CACs (of the form 1010XXX, 1015XXX and 1016XXX). At the end of the permissive dialing period, then all digits from 1010000 to 1019999 will be valid FGD CAC numbers.

1.5 DIALING AND ROUTING CONVERSIONS

Because a nationwide “flash” cutover to the new dial formats is not feasible, Bellcore has outlined a phased plan that organizes incremental changes in the following phases:

- ▶ ***Permissive Dialing period*** introduces the new dialable formats into the network on a node-pair basis (two nodes at a time). During this period network elements will accommodate both new and old CIC/CAC formats. The permissive dialing period has two phases:
 1. During the first phase all four-digit CICs have a leading zero, permitting a maximum of 970 different codes. This is the same limit as set by today’s three-digit code format (thirty codes in the series 10X, 15X, and 16X are reserved).
 2. During the second phase new four-digit CICs have a leading zero, five, or six. This permits a maximum of 2,970 different codes. During this phase, CICs in the series 10X, 15X, and 16X remain reserved.
- ▶ ***Final Conversion period*** ends today’s CIC/CAC dialing formats altogether, accepting only the new four-digit CIC and seven-digit CAC formats. This permits a maximum of 10,000 different CIC numbers.

The following table lists the CAC/CIC conversion phases, the valid dialable CAC formats within each phases, and the total number of CICs available in each phase.

CAC/CIC Changes During the Conversion Phases

Conversion phases	Valid CACs	Total number of CICs available
Current: three-digit CICs	10XXX	970
Permissive dialing - part I All CICs have leading zero (0XXX). No 5XXX or 6XXX series CICs assigned.	10XXX 1010XXX	970
Permissive dialing - part II 5XXX and 6XXX CICs assigned (in addition to 0XXX)	10XXX 1010XXX 1015XXX 1016XXX	2970
Final conversion phase	101XXXX	10,000

The DMS system will route invalid CACs dialed in each phase to vacant code treatment.

Permissive Dialing Phase

Throughout the planned “permissive dialing” period, there will be a mixture of subscribers dialing both the old and the new CAC/CIC formats. To accommodate all subscribers, both five- and seven-digit CACs will be accepted and routed by the DMS system during this entire period. This means both “10” and “101” will be valid leading digits for any CAC.

Until now the 10X, 15X, and 16X CIC series have gone unassigned. During the permissive dialing phase they will continue to be reserved to permit temporary unambiguous codes. For example: if the 10X series was assignable, then a switch may respond to a five-digit CAC of 10-109 when the subscriber intended to dial a seven-digit CAC of 101-0999.

Valid CIC dialing formats change slightly during the two phases of the permissive dialing period:

- Initially, all four-digit CICs have a leading zero, permitting a maximum of 970 different codes. The network will accept as valid any CAC in the 10XXX, 1010XXX series (provided the final three digits are not in the 10X, 15X, and 16X series).
- When the 0XXX series has been exhausted, then four-digit CICs in the 5XXX and 6XXX series will be assigned, permitting a maximum of 2,970 different codes. The network will accept as valid CACs in the 10XXX, 1010XXX, 1015XXX, or 1016XXX series. Note that the 5XXX and 6XXX CIC series will not have a five-digit equivalent.

Final Conversion Phase

At a time to be determined by the industry, the permissive dialing period will end and only seven-digit CACs will be accepted with the format of 101XXXX. All CIC codes between 0000 and 9999 will be valid, ending the former 10X, 15X, and 16X restrictions.

1.6 NETWORK CONVERSIONS

As with changes to dialing sequences, the network changes for FGD CIC Expansion will occur in a planned sequence. Most of the changes will be performed on a “per node pair” basis (by trunk group or by CCS7 link). For a given pair of network elements, connecting trunks or signaling links are subject to individual conversions. For example, a particular trunk group between an end office and an access tandem can convert from three-digit to four-digit CICs once both switches are ready for the new dialing formats for that one group, while other trunk groups remain at three-digit CICs. The trunk signaling upgrades occur on a per-trunk group and per-link basis until the network converts fully to the new dialing/routing formats.

The changes introduced by this feature primarily affect the end office and access tandem, but other elements in the network will also need to be updated. The following is the proposed network update sequence:

1. Convert Service Control Point (SCP) database and Service Management System (SMS) to store both three-digit and four-digit CICs. The SCP will respond with either three-digit or four-digit CICs when queried by Service Switching Points (SSPs) and Operator Services Systems.
2. Convert access tandems to accept-on a per trunk group basis-four-digit CICs on upgraded trunk groups from updated Equal Access End Offices (EAEOs), while accepting three-digit CICs from non-updated ones. The Operator Services Systems interface (where applicable) will also be updated at this time to accept four-digit CICs. During the permissive dialing period, an access tandem or InterLATA Carrier (IC) switch will receive only three-digit or four-digit CICs (never both) on the same trunk group from a given EAEO.
3. Convert EAEOs to accept and route five-digit and seven-digit CACs for a permissive dialing phase for a period of time sufficient to accommodate end user adjustments and to accept four-digit CICs from an SCP when the EAEO serves as an SSP.
4. When the permissive dialing period ends, network elements will reject five-digit CACs and accept/route seven-digit CACs only.
5. Convert IC switches to accept four-digit CICs, from upgraded trunk groups, for international calls (only).

1.7 AVAILABILITY

Northern Telecom's BCS releases provide the DMS system capabilities to address different phases of the FGD CIC Expansion plan.

Because different Equal Access features for the Northern Telecom software packages roll out between BCS34 and BCS37, this document often refers to Feature ID numbers, to clarify availability. The following table lists these Northern Telecom features with currently scheduled general availability.

Feature ID number	Feature descriptions	NTX186AB (End office) availability	NTX386AB (Access tandem) availability
NC0335	Expansion for the OCCINFO table <ul style="list-style-type: none"> • Four-digit CIC entries • Addition of the ORIGCARR field 	BCS34	BCS34
NC0428	Base Translations Cellular Type 1A Interconnect Enhanced WATS Multifrequency Trunk Outpulsing SS7 TR-394 Outpulsing Subscriber Dialing	BCS35 BCS35 BCS35 BCS35 BCS35 BCS35	BCS35 BCS35 - BCS35 BCS35 BCS35
AN0172	ISDN Services Service Analysis Support Service Evaluation System Support	BCS35 BCS35 BCS35	-- BCS35 BCS35
AN0173	Enhanced 800 Service Private Virtual Networks Equal Access Alternate Switching Point Cellular Type 2A Interconnect	BCS36 BCS36 BCS36 BCS36	BCS36 BCS36 BCS36 BCS36
AN0174	FGD CIC Expansion support in LATA Equal Access System and Equal Access Intermediate Tandem offices	-	Bridge back to BCS36 stream by April 94 (GA in BCS37)

BCS34 and BCS35 are generally available today. BCS36 is currently scheduled to be generally available by April 1994. Also, feature AN0174 is scheduled to be bridged back into the BCS36 stream by April 1994.

Also, Feature IDs AN0834 and AN0883-Feature Group D CIC Expansion support for TOPS offices-will be part of bridging software package NTXP78AB. This DMS TOPS package is currently scheduled to be generally available in BCS37 and be bridged back into the BCS36 stream by April 1994.

1.8 COMPLIANCE

Northern Telecom's phased rollout of expanded FGD Carrier Identification Code capacity has been developed in close consultation with Bellcore and the Industry Carrier Compatibility Forum, and complies with the following publications:

- TR-NWT-001050, *The Expansion of Carrier Identification Code Capacity for Feature Group D*
- TR-TSY-000698, Revision 1, *The Expansion of Carrier Identification Code Capacity for Feature Group B*
- TR-NWT-000064, *LATA Switching Systems Generic Requirements*
- TR-TSY-000024, *Service Switching Points Generic Requirements*
- TR-NWT-000533, *Database Services LATA Switching Systems Generic Requirements (Service Switching Point)*
- TR-TSY-000402, *Additional Service Switching Point and Related End Office Capabilities (includes Private Virtual Network Services)*
- TR-NWT-000271, *Operator Services Systems Generic Requirements*
- TR-TSY-000394, *Switching System Requirements for Interexchange Carrier Interconnections using the ISDNUP*
- TR-NWT-000448, *ISDN Routing and Digit Analysis*
- FSD 20-24-0000, *InterLata-Carrier/International-Carrier Interconnection*

2.3 TRANSLATION OVERVIEW

The following translation information for tables (Section 2.4) and office parameters (Section 2.5) discusses only those directly altered by software package NTX186AB for FGD CIC Expansion. All other tables and office parameters that must be datafilled are not changed by NTX186AB and so are not discussed in this document.

For example, table OCCNAME, which establishes the spelling standard for carriers for other tables, must list all connected carriers for Equal Access software to work properly, but the table's purpose, layout, and operation has not been altered by NTX186AB-so it is not included here. Northern Telecom will provide details on how to datafill an EAEO office for software package NTX186AB with the release of NTP 297-2101-352 (03.03).

2.4 TABLES IMPACTED BY THE FGD CIC EXPANSION

The FGD CIC Expansion plan impacts four tables: table OCCINFO to datafill valid CIC codes, subtable STDPRTCT.STDPRT to allow translation of seven-digit CACs, table CICSIZE4 to identify the trunk groups that use four-digit CICs, and table LMOVCODE whose maximum size decreases with the implementation of the expansion software.

Table OCCINFO: to datafill CIC codes

Table OCCINFO is impacted directly by the FGD CIC Expansion plan. Feature NC0335, in NTX186AB, generally available with BCS34, changed table OCCINFO in the following ways.

► **Four-digit codes in the CARRNUM field**

With NC0335, four-digit CICs appear in the CARRNUM field instead of three-digit CICs. To save the network provider time, the DMS-100 converts (at a dump and restore) an office's current carrier datafill to four digits automatically by adding a leading zero to any three-digit entries. This means the CARRNUM field does not have to be changed manually, except when adding new carriers into the table (four-digit CICs required). The following shows OCCINFO datafill at BCS33 (before feature NC0335), and the same datafill after a dump and restore for BCS34. Note the changes made to the second field, CARRNUM.

With BCS33:

CARRNAME	CARRNUM	ACCESS	INTER	INTNTL	INTRA	ANI	FANI	ONISCRN	AD1
OVERLAP	INTERS	INTRAS	TERMREC	OCCSEPNO	OPSIG	PICIND	NOA950	INCCPN	
DTMFIND	OPSERV	CACBLOCK	CTDOA	CMCMON	SCRNWATS	CRMCRA	ATPINCL		
INTRAOPR									
CARRIERX	306	TRANS	Y	Y	Y	Y	N	N	Y
Y	Y	Y	LONG		0	FGRPD	N	N	N
N	N	N	N	N	N		Y	N	
N									
CARRIERY	027	TRANS	Y	Y	Y	Y	N	N	Y
Y	Y	Y	LONG		0	FGRPD	N	N	N
N	N	N	N	N	N		Y	N	
N									
CARRIERZ	306	TRANS	Y	Y	Y	Y	N	N	Y
Y	Y	Y	LONG		0	FGRPD	N	N	N
N	N	N	N	N	N		Y	N	
N									

With BCS34:

CARRNAME	CARRNUM	ACCESS	ORIGCARR	INTER	INTNTL	INTRA	ANI	FANI	ONISCRN	AD1	OVERLAP	INTERS	INTRAS	TERMREC	OCCSEPNO	OPSIG	PICIND	NOA950	INCCPN	DTMFLD	OPSERV	CACBLOCK	CTDOA	CMCMON	SCRNWATS	CRMCR	ATPINCL	INTRA	OPR
CARRIERX	0306	TRANS	N	Y	Y	Y	Y	N	N	Y	Y	LONG	0	FGRPD	N														
N	Y	Y	Y	N	N	N	N	N																					
N	N	N	N	N	N	N	N	N																					
Y	N	N	N	N	N	N	N	N																					
CARRIERY	0027	TRANS	N	Y	Y	Y	Y	N	N	Y	Y	LONG	0	FGRPD	N														
N	Y	Y	Y	N	N	N	N	N																					
N	N	N	N	N	N	N	N	N																					
Y	N	N	N	N	N	N	N	N																					
CARRIERZ	0306	TRANS	N	Y	Y	Y	Y	N	N	Y	Y	LONG	0	FGRPD	N														
N	Y	Y	Y	N	N	N	N	N																					
N	N	N	N	N	N	N	N	N																					
Y	N	N	N	N	N	N	N	N																					

► **New field permits reverse mapping**

Feature NC0335 added a new field-ORIGCARR (original carrier)-to table OCCINFO (after the ACCESS field) so the network provider can datafill two or more entries in table OCCINFO with the same CIC. This is used by Number Services Calls (NSC) and other features that perform “reverse mapping”. Reverse mapping converts carrier digits into a carrier name. The DMS software uses this carrier name to index table OCCINFO. If there is more than one entry for this carrier name, the DMS software reads the particular tuple with ORIGCARR = Y. A dump and restore procedure automatically sets field ORIGCARR to “Y” for the tuples that were previously being used for reverse mapping (BCS34 and later).

► **Not all 10,000 codes need to be in OCCINFO**

The maximum size of table OCCINFO is 1,000 entries (9,000 words). Although final network-wide conversion will permit as many as 10,000 CICs, TR-1050 allows a maximum of 1,000 at any one end office.

Table STDPRTCT.STDPRT: to associate numbers with carriers

When the originating line attributes specify a pretranslator name, subtable STDPRTCT.STDPRT is the first table indexed. With BCS35, seven-digit CACs need to be manually added to this subtable. In the example below, the first entry has a call with leading digits 1010001 route to carrier CARR1 through table OFRT 100 unless otherwise specified in the second stage pretranslator OCC1. The second entry has a call with leading digits 1010999 route to carrier CARR2 through second pretranslator OCC2.

FROMDIGS	TODIGS	PRETRE
1010001	1010001	
EA DD 5 P OCC1	CARR1 Y	OFRT 100 6 24 N
1010999	1010999	
EA DD 5 O OCC2	CARR2 N	

Table CICSIZE4: to identify trunks that carry four-digit CICs

BCS35 introduces table CICSIZE4, intended to designate the trunk groups that will use four-digit CICs, in conjunction with similar datafill simultaneously set at the access tandem (AT). Trunk groups not appearing in CICSIZE4 are assumed to use three-digit CICs. The key field, TRUNKGRP, is the only field in the table. The following is an example of Table CICSIZE4:

TRUNKGRP ----- TGRPX TGRPY TGRPZ
--

If a call will be directed over a trunk that is not included in CICSIZE4, then the leading digit of the four-digit CIC (derived from OCCINFO) will be stripped off to form a three-digit CIC-and sent this way to the AT or IC/INC.

Table LMOVCODE: to identify NXX codes not requiring OCS

The FGD CIC Expansion plan's digit translations may impact the size of table LMOVCODE, which is used to determine which NXX codes do not require Overlap Carrier Selection (OCS). The size of the entire digit collection table is limited to 256 bytes, and the FGD CIC Expansion software consumes an additional eight bytes of this area. If the present digit collection table is full, some of the contents of table LMOVCODE may not be read. For further information, refer to Northern Telecom Publication 297-1001-451, *DMS-100 Family Customer Data Schema*.

2.5 OFFICE PARAMETERS IMPACTED BY THE FGD CIC EXPANSION

BCS35 adds two new office parameters to table OFCENG: one to control CAC digit interpretation during the phased transitions (EAE0_FOUR_DIGIT_CIC_STATUS) and the second to streamline software processing when an EAE0 becomes completely converted (EA_TAB_CICSIZE4_OBSOLETE). Details on these two parameters follow.

EAE0_FOUR_DIGIT_CIC_STATUS: to control digit interpretation

To control the phased CAC conversions, a new office parameter has been created with BCS35: EAE0_FOUR_DIGIT_CIC_STATUS. Translations use this office parameter to determine which digit sequences are currently valid. Added to table OFCENG, this office parameter permits one of three states, following the phased conversion transitions:

1. **THREEDIG**
This default state instructs translations to accept only three-digit CICs. This is intended for use *before* the permissive dialing period.
2. **PERMISSIVE**
This is the valid setting during the permissive dialing period. Both five-digit and seven-digit CACs in the form 10XXX, 1010XXX, 1015XXX, and 1016XXX are valid. To decide which CAC format should be prefixed to a PIC call, the first digit of the CIC is checked. If zero, the software uses the CAC format of 10XXX. Otherwise, the software sends the CAC format of 101XXXX to the access tandem or InterLATA Carrier.
3. **FOURDIG**
This is the valid setting when the permissive period ends. With this setting only four-digit CICs are valid.

When changes are made to this office parameter, peripherals must have their static data reloaded in order for valid digit collection to occur.

EA_TAB_CICSIZE4_OBSOLETE: to identify fully-converted office

BCS35 introduces a new office parameter, EA_TAB_CICSIZE4_OBSOLETE, in both EAE0 and AT offices. When an office is fully converted to four-digit CICs, then table CICSIZE4 will no longer be necessary. The EAE0 or AT can then be instructed to override checking CICSIZE4 by setting EA_TAB_CICSIZE4_OBSOLETE set to Y (table CICSIZE4 will no longer need to be datafilled).

This office parameter must only be set to true when no trunks in the office carry three-digit CICs. A warning message appears when this office parameter is changed (“Warning, this office parameter must only be set to true when no trunks in the office carry 3-digit CICs”) to guard against accidental activation.

2.6 IMPACT ON MERIDIAN DIGITAL CENTREX

The size of the digit register is limited to 24 digits. Expanding the number of CAC digits from five to seven reduces the maximum number of Meridian Digital Centrex (MDC) prefix digits used for international calls from three to two. To accommodate this restriction, table IBNXL A generates a warning message if an attempt is made to datafill the Equal Access selector using more than two prefix digits. This is required because dialing a four-digit CIC and making an international call using more than two prefix digits will overflow the 24 digit register and cause the call to fail.

2.7 IMPACT ON ISDN CALLS

NTX186AB's feature AN0172 (available now with BCS35) interworks ISDN signaling with tables and office parameters changed by the FGD CIC Expansion-so no additional datafill is required for both Basic Rate Interface and Primary Rate Interface ISDN calls.

An ISDN call's SETUP message includes a TNS (Transit Network Selection) that contains the carrier digits (as part of a CAC or PIC). The structure of the TNS element allows the storage of an extra carrier digit without modification.

2.8 IMPACT ON CCS7

EAEO calls route to an IC/INC either directly over CCS7 ATC (access to carrier) trunks or indirectly through an AT over CCS7 intertoll trunks. The EAEO establishes a call by sending an outgoing initial address message (IAM) to the AT or IC/INC. The structure of the IAM for an Equal Access call appears in the following table.

Structure of the Initial Address Message (IAM)

Parameter	Type
Message Type	Mandatory
Nature of Connections Indicators	Mandatory
Forward Call Indicators	Mandatory
Calling Party's Category	Mandatory
User Service Information	Mandatory
Called Party Number	Variable
Calling Party Number	Optional
Charge Number	Optional
Originating Line Information	Optional
Transit Network Selection	Optional
Carrier Selection	Optional

To support four-digit CICs over CCS7 trunk groups, a change is required to the optional Transit Network Selection (TNS) parameter (BCS35 and higher). No other parameters are changed. The TNS parameter appears in the IAM for national and international calls routed to the AT and appears in the IAM to the INC for international calls (only). The TNS parameter contains a Circuit Code and a Carrier Identification Code that, with BCS35, include either a three-digit or four-digit CIC.

The structure of the TNS parameter changes, depending on the presence of a three-digit or four-digit CIC, as shown below.

TNS parameter with three-digit CIC

8	7	6	5	4	3	2	1
Spare	Type of network identification plan			Network Identification			
CIC digit 2				CIC digit 1			
Circuit Code				CIC digit 3			

TNS parameter with four-digit CIC

8	7	6	5	4	3	2	1
Spare	Type of network identification plan			Network Identification			
CIC digit 2				CIC digit 1			
CIC digit 4				CIC digit 3			
Circuit Code				Reserved			

*Network Identification: 0001 indicates three-digit CIC is included
0010 indicates four-digit CIC is included*

The decision the DMS software makes to outpulse a three-digit or four-digit CIC is based only on the datafill for table CICSIZE4 and is independent of the CAC/PIC received. If a trunk is not included in CICSIZE4, then the leading digit of the four-digit CIC will be stripped off to form a three-digit CIC-and included this way into the TNS parameter.

Of course, if the office parameter EA_TAB_CICSIZE4_OBSOLETE is set to Y, then the TNS parameter will always include a four-digit CIC regardless of the datafill in table CICSIZE4.

2.9 EAEO IMPLEMENTATION

Activation to the Permissive Dialing Phase

During the permissive dialing period, a DMS-100 serving as an Equal Access End Office will accept and route both five-digit or seven-digit CACs from originating lines. The actual procedures involved in preparing an office to progress from current CIC formats to the permissive dialing formats follow.

1. In the process of completing a dump and restore procedure, the three-digit CIC codes in table OCCINFO are automatically changed to four-digit codes by the software inserting a leading zero in front of existing entries. The only manual activity required is to add new entries, if needed, with four-digit CICs (OCCINFO accepts up to 1,000 entries).
2. Manually add seven-digit CACs into the standard pretranslator, subtable STDPRTCT.STDPRT.
3. Set office parameter EAEO_FOUR_DIGIT_CIC_STATUS to PERMISSIVE.
4. Reload Central Controller Data in all the Extended Peripheral Modules (XPMs) serving line control devices. This will reset the digit collection correctly in the peripherals.
5. Add the Trunk CLLI (Common Language Location Identifier) values to table CICSIZE4 for those trunk groups that will carry four-digit CIC traffic. Continue to revise table CICSIZE4 as additional trunk groups transfer to the four-digit CIC code in conjunction with the AT or IC.

Activation to the Final Conversion Phase

When the permissive dialing period ends, a DMS-100 serving as an Equal Access End Office will accept and route only seven-digit CACs from originating lines. The actual procedures involved in preparing an EAEO to progress from permissive dialing CIC formats to the final dialing format follow.

1. Manually delete all five-digit CACs out of the standard pretranslator, subtable STDPRTCT.STDPRT. Only seven-digit entries are valid.
2. Set office parameter EAEO_FOUR_DIGIT_CIC_STATUS to FOURDIG.
3. Reload Central Controller Data in all the Extended Peripheral Modules (XPMs) serving line control devices. This will reset the digit collection correctly in the peripherals.
4. At this stage all trunk groups should be carrying four-digit CIC codes, so table CICSIZE4 is no longer needed. Now that CICSIZE4 will no longer be datafilled, set to "Y" the office parameter EA_TAB_CICSIZE4_OBSOLETE.

2.10 EASP IMPLEMENTATION

If transmission facilities between an EAEO and an AT become damaged and an alternate route is required, an EASP (Equal Access Alternate Switching Point) office transfers these calls. Northern Telecom's feature AN0173 (part of software packages NTX186AB and NTX386AB, scheduled to be generally available with BCS36) permits EASP offices to support the FGD CIC Expansion, so the EASP office can receive and send three or four digits depending on the datafill to CICSIZE4.

Activation to the Permissive Dialing Phase

During the permissive dialing period, an EASP office will accept and route both three-digit and four-digit CICs. The actual procedures involved in preparing an office to progress from current CIC formats to the permissive dialing formats follow.

1. In the process of completing a dump and restore procedure, the three-digit CIC codes in table OCCINFO are automatically changed to four-digit codes by the software inserting a leading zero in front of existing entries. The only manual activity required is to add new entries, if needed, with four-digit CICs (OCCINFO accepts up to 1,000 entries).
2. Manually add seven-digit entries (of the form 0ZZXXXX) into the standard pretranslator, subtable STDPRTCT.STDPRT.
3. Add the Trunk CLLI values to table CICSIZE4 for those trunk groups that will carry four-digit CIC traffic. Continue to revise table CICSIZE4 as additional trunk groups transfer to the four-digit CIC code.

Activation to the Final Conversion Phase

When the permissive dialing period ends, only seven-digit CACs are valid. The actual procedures involved in preparing an EASP office to progress from permissive dialing CIC formats to the final dialing format follow.

1. Manually delete all six-digit entries (of the form 0ZZXXX) from the standard pretranslator, subtable STDPRTCT.STDPRT. Only seven-digit entries (of the form 0ZZXXXX) are valid.
2. At this stage all trunk groups should be carrying four-digit CIC codes, so table CICSIZE4 is no longer needed. Now that CICSIZE4 will no longer be datafilled, set to "Y" the office parameter EA_TAB_CICSIZE4_OBSOLETE.

3.3 TRANSLATION OVERVIEW

The following translation information for tables (Section 3.4) and office parameter (Section 3.5) discusses only those directly altered by software package NTX386AB for FGD CIC Expansion. All other tables and office parameters that must be datafilled are not changed by NTX386AB and so are not discussed here.

For example, table OCCNAME, which establishes the spelling standard for carriers for other tables, must list all connected carriers for Equal Access software to work properly, but the purpose, layout, and operation of the table has not been altered by NTX386AB-so it is not included here. Northern Telecom will provide details on how to datafill an AT office for Software Package NTX386AB with the release of NTP 297-2101-352 (03.03).

3.4 TABLES IMPACTED BY THE FGD CIC EXPANSION

The FGD CIC Expansion plan impacts three tables: table OCCINFO to datafill valid CIC codes, subtable STDPRTCT.STDPRT to associate digits with carriers, and table CICSIZE4 to identify the trunk groups that use four-digit CICs.

Table OCCINFO: to datafill CIC codes

Table OCCINFO defines the attributes for carriers serving the AT and screens calls for carrier compatibility. Feature NC0335, now generally available in NTX386AB with BCS34, changed table OCCINFO in the following ways.

► ***Four-digit codes in the CARRNUM field***

With NC0335, four-digit CICs appear in the CARRNUM field instead of three-digit CICs. To save the network provider time, the DMS-200 converts (at a dump and restore) an office's current carrier datafill to four digits automatically by adding a leading zero to any three-digit entries. This means the CARRNUM field does not have to be changed manually, except when adding new carriers into the table (four-digit CICs required).

► ***New field permits reverse mapping***

Feature NC0335 added a new field-ORIGCARR (original carrier)-to table OCCINFO (after the ACCESS field) so the network provider can datafill two or more entries in table OCCINFO with the same CIC. This is used by Number Services Calls (NSC) and other features that perform "reverse mapping". Reverse mapping converts carrier digits into a carrier name. The DMS software uses this carrier name to index table OCCINFO. If there is more than one entry for this carrier name, the DMS software reads the particular tuple with ORIGCARR = Y. A dump and restore procedure automatically sets field ORIGCARR to "Y" for the tuples that were previously being used for reverse mapping (BCS34 and later).

► ***Not all 10,000 codes need to be in OCCINFO***

The maximum size of table OCCINFO is 1,000 entries. Any particular access tandem will serve a number of IC/INC switches below this maximum limit.

Table STDPRTCT.STDPRT: to associate numbers with carriers

Subtable STDPRTCT.STDPRT is the first table to be indexed by the received leading digits when the TRKGRP datafill specifies a pretranslator name. With BCS35, seven-digit entries need to be manually added to this subtable in the form 0ZZXXXX.

Table STDPRTCT						
POS P621						
P621 (1)						
SUB						
	FROMDIGS	TODIGS	PRETRE			
<i>current entry</i>	080222	080222	T NP 6	OFRT	202	6 6 NONE
<i>additional entry</i>	0800222	0800222	T NP 7	OFRT	202	7 7 NONE

Table CICSIZE4: to identify trunks that carry four-digit CICs

BCS35 introduces table CICSIZE4, to datafill the trunk groups that will use four-digit CICs. Trunk groups not appearing in CICSIZE4 are assumed to use three-digit CICs. The key field, TRUNKGRP, is the only field in the table. Unlike the EAEO, the ability to carry four-digit CICs depends only on the datafill in table CICSIZE4 and not on the CIC received. Over a trunk datafilled in CICSIZE4, the access tandem can expect to receive four-digit CICs on InterLATA calls independent of whether or not it received a four-digit CIC from the subscriber.

The following is an example of table CICSIZE4.

TRUNKGRP

TGRP X
TGRP Y
TGRP Z

3.5 OFFICE PARAMETER ADDED BY THE FGD CIC EXPANSION**EA_TAB_CICSIZE4_OBSOLETE: to identify fully-converted office**

BCS35 introduces a new office parameter, EA_TAB_CICSIZE4_OBSOLETE, in both end office and access tandems. When an office is fully converted to four-digit CICs, then table CICSIZE4 will no longer be necessary. The AT can then be instructed to override checking CICSIZE4 by setting EA_TAB_CICSIZE4_OBSOLETE to Y (table CICSIZE4 will no longer need to be datafilled).

This office parameter must only be set to “true” when no trunk group in the office carries three-digit CICs. A warning message appears when this office parameter is changed (“Warning, this office parameter must only be set to true when no trunks in the office carry 3-digit CICs”) to guard against accidental activation.

3.6 IMPACT ON CCS7

From the EAEO to the AT

An EAEO can send originating Equal Access calls to the AT over CCS7 intertoll trunk groups. With CCS7 signaling, the EAEO establishes a call with an initial address message (IAM) that contains call setup information for the access tandem office. The IAM's Transit Network Selection (TNS) parameter contains the CIC digits.

As detailed in Section 2.8, *Impact on CCS7*, the decision the DMS software makes to output a three-digit or four-digit CIC is based only on the datafill for table CICSIZE4 and is independent of the CAC/PIC received. If a trunk is not included in CICSIZE4, then (with BCS35) the leading digit of the four-digit CIC will be stripped off to form a three-digit CIC-and sent this way in the TNS parameter to the access tandem office.

Of course, if the EAEO's office parameter EA_TAB_CICSIZE4_OBSOLETE is set to Y, then the TNS parameter to the AT will always include a four-digit CIC regardless of the datafill in table CICSIZE4.

From the AT to the INC

Equal Access calls can route from the AT to an InterLATA Carrier (IC) or International Carrier (INC) over CCS7 ATC (access to carrier) trunk groups. In the case of international calls, the translation process at the AT differs slightly when the inbound signaling is received over a CCS7 link or over an MF (multifrequency) trunk group, as discussed below.

► **Receive CCS7, Send CCS7**

In the case of an international call with CCS7 signaling coming into the AT and CCS7 signaling going out, the AT will send an IAM to the INC switch. With BCS35, the DMS software can take the received CIC and prefix it with a zero or strip the leading digit, as needed to comply with the datafill in table CICSIZE4, before sending the code in the TNS parameter to the INC.

► **Receive MF, Send CCS7**

The translation process differs if an international call reaches the AT over an MF link for routing out on a CCS7 link.

1. The DMS software uses the carrier name datafilled in table TRKGRP as the index into table OCCINFO.
2. The software extracts the carrier identification code from table OCCINFO.
3. The software decides whether to send three-digit or four-digit CICs based on the datafill in CICSIZE4. If the CIC is four-digits and the trunk does not appear in CICSIZE4, then it strips the CIC's leading digit and sends the remaining three digits in the TNS parameter to the INC.

3.7 AT IMPLEMENTATION

Activation to the Permissive Dialing Phase

During the permissive dialing period, a DMS-200 serving as an access tandem will accept and route four-digit CICs from updated end offices, as well as process three-digit CICs from non-updated end offices. The actual procedures involved in preparing an office to progress from current CIC formats to the permissive dialing formats follow.

1. In the process of completing a dump and restore procedure, the three-digit CIC codes in table OCCINFO are automatically changed to four-digit codes by the software inserting a leading zero in front of existing entries. The only manual activity required is to add new entries, if needed, with four-digit CICs (OCCINFO accepts up to 1,000 entries).
2. Manually add seven-digit entries (of the form 0ZZXXXX) into the standard pretranslator, subtable STDPRTCT.STDPRT.
3. If there is an entry in subtable STDPRTCT.STDPRT using the Number Services Calls (NSC) selector, a corresponding one needs to be datafilled for four-digit CICs (in the form 0ZZXXXX).
4. Add the Trunk CLLI (Common Language Location Identifier) values to table CICSIZE4 for those incoming and outgoing trunk groups that will carry four-digit CIC traffic. Continue to revise table CICSIZE4 as additional trunk groups transfer to the four-digit CIC code in conjunction with the EAEO or IC/INC office at the far end of each group.

Activation to the Final Conversion Phase

When the permissive dialing period ends, all subtending EAEOs will send seven-digit CACs only. The actual procedures involved in preparing an AT office to progress from permissive dialing CIC formats to the final dialing format follow.

1. Manually delete all six-digit entries (of the form 0ZZXXX) from the standard pretranslator, subtable STDPRTCT.STDPRT. Only seven-digit entries (of the form 0ZZXXXX) are valid.
2. At this stage all trunk groups should be carrying four-digit CIC codes, so table CICSIZE4 is no longer needed. Now that CICSIZE4 will no longer be datafilled, set to "Y" the office parameter EA_TAB_CICSIZE4_OBSOLETE.

3.8 LEAS IMPLEMENTATION

A LEAS (LATA Equal Access System) office permits an access tandem to provide Equal Access (EA) services to subtending end offices that do not provide EA services to subscribers. Northern Telecom's feature AN0174 (in NTX386AB, scheduled to be bridged into the BCS36 stream) permits LEAS offices to receive and send three-digit/four-digit CICs, following the plan as detailed for the access tandem office. The following discusses the few differences between datafilling a LEAS office and datafilling an AT office.

New office parameter

Feature AN0174 adds a new office parameter to control the use of five- or seven-digit CACs for LEAS Primary InterLATA Carrier (PIC) calls. Unlike other parameters and tables discussed in this section, the new LEAS_FOUR_DIGIT_CIC_STATUS applies to PIC calls only.

LEAS_FOUR_DIGIT_CIC_STATUS can hold one of three different states:

1. **THREEDIG**
This default state translates all incoming PIC calls with CACs of the form 10XXX. This is intended for use *before* the permissive dialing period.
2. **PERMISSIVE**
This is the valid setting during the permissive dialing period. Both five-digit and seven-digit CACs in the form 10XXX, 1010XXX, 1015XXX, and 1016XXX are valid. To decide which CAC format should be prefixed to the PIC call, the first digit of the CIC is checked. If zero, the software uses the CAC format of 10XXX. Otherwise, the software uses the CAC format of 101XXXX.
3. **FOURDIG**
This is the valid setting when the permissive period ends. All incoming PIC calls translate with a CAC form of 101XXXX.

Additional entries to STDPRTCT.STDPRT

For CAC calls, some non-converted end offices may delete the first CAC digit. The LEAS office receives 0XXX instead of the dialed 10XXX digits. To accommodate this, entries for 0XXX and 01XXXX as well as 10XXX and 101XXXX should be datafilled in the standard pretranslator, STDPRTCT.

Activation to the Permissive Dialing Phase

During the permissive dialing period, a DMS-200 serving as a LEAS office will accept and route both three-digit and four-digit CICs. The actual procedures involved in preparing an office to progress from current CIC formats to the permissive dialing formats follow.

1. For every five-digit CAC entry in the pretranslator table (subtable STDPRTCT.STDPRT), there must be a corresponding seven-digit entry. For example, for the existing five-digit CAC 10333, there must be a seven-digit CAC entry of 1010333. Because some end offices delete the first digit for CAC dialed calls, entries for 0XXX and 01XXXX are also necessary in this table.
2. Set office parameter LEAS_FOUR_DIGIT_CIC_STATUS to PERMISSIVE.
3. Add the Trunk CLLI values to table CICSIZE4 for those trunk groups that will carry four-digit CIC traffic. Continue to revise table CICSIZE4 as additional trunk groups transfer to the four-digit CIC code.

Activation to the Final Conversion Phase

When the permissive dialing period ends, only seven-digit CACs are valid. The actual procedures involved in preparing a LEAS office to progress from permissive dialing CIC formats to the final dialing format follow.

1. Delete all five-digit CACs from the pretranslator table (subtable STDPRTCT.STDPRT). Only seven-digit CACs are valid.
2. Set office parameter LEAS_FOUR_DIGIT_CIC_STATUS to FOURDIG.
3. At this stage all trunk groups should be carrying four-digit CIC codes, so table CICSIZE4 is no longer needed. Now that CICSIZE4 will no longer be datafilled, set to "Y" the office parameter EA_TAB_CICSIZE4_OBSOLETE.

3.9 EAIT IMPLEMENTATION

An EAIT (Equal Access Intermediate Tandem) office transfers Equal Access calls from an end office (that does not provide EA services) to an access tandem office. The EAIT software-operating on top of the LEAS software-will be upgraded to outpulse three-digit or four-digit CICs, depending on the datafill of CICSIZE4.

Northern Telecom's feature AN0174 (in NTX386AB, scheduled to be bridged into the BCS36 stream) permits EAIT offices to support the FGD CIC Expansion, following the plan as discussed for the LATA Equal Access System office.

The only translations requirement for EAIT software is for craftspersons to complete the steps for FGD CIC Expansion activation for the LEAS software (as detailed in Section 3.8). No other translation procedures are necessary.

4.0 DMS-200 TOPS Plan

Impact of Bridging Software Package NTXP78AB

This section discusses the impacts of software package NTXP78AB on DMS-200 offices supporting the Traffic Operator Position System (TOPS). Currently, NTXP78AB is scheduled to be generally available with BCS37, and be bridged back into the BCS36 stream by April 1994.

4.1 INTRODUCTION

TOPS provides operator assistance for toll calls and automates operator functions by integrating an operator system with a DMS toll switching office. The bridging software package NTXP78AB interworks TOPS with changes made by the DMS-200 NTX386AB software package, in addition to providing some TOPS-specific capabilities. No new hardware interfaces or firmware changes are required for the FGD CIC Expansion.

4.2 TRANSLATION OVERVIEW

The following translation information for tables (Section 4.3) and office parameters (Section 4.4) discusses only those directly altered by FGD CIC Expansion. All other tables and office parameters that must be datafilled are not changed by NTX386AB and so are not discussed here. The following changes are in addition to the table and office parameter changes for an access tandem discussed in Section 3, *DMS-200 Plan*.

4.3 TABLES IMPACTED BY THE FGD CIC EXPANSION

The following discusses the impact of the FGD CIC Expansion software on seven tables: subtable STDPRTCT.STDPRT, subtable CLSVSCRC.CLSVSCR, table TOPEACAR, table TOPEATRK, table BRANDANN, table EAACTSAN, and table EAMCCSAN.

Table STDPRTCT.STDPRT: to associate numbers with carriers

Subtable STDPRTCT.STDPRT needs to have seven-digit entries keyed in for all six-digit domestic entries, and ten-digit entries keyed in for all nine-digit international entries in the form:

	Domestic format	International format
Current entry	0ZZ-XXX	1NX-XXX-CCC
Additional entry	0ZZ-0XXX	1NX-0XXX-CCC

Note that international tuples are often entered without the country code (CCC in the above table), yet still show "10" in the minimum and maximum digit size fields (when updated for CIC expansion), as in the bottom tuple in the following example datafill.

	FROMDIGS	TODIGS							PRETRE	
<i>current entry</i>	088222	088222	T	NL	6	OFRT	804	6	6	NONE
<i>additional entry</i>	0880222	0880222	T	NL	6	OFRT	804	7	7	NONE
<i>current entry</i>	127222	127222	T	NL	0	OFRT	804	9	9	NONE
<i>additional entry</i>	1270222	1270222	T	NL	0	OFRT	804	10	10	NONE

Subtable CLSVSCRC.CLSVSCR: for class of service screening

The contents of subtable STDPRTCT.STDPRT and subtable CLSVSCRC.CLSVSCR must have duplicate datafill for every tuple containing Carrier Code digits. Craftspersons need to manually add four-digit CICs to table CLSVSCRC, subtable CLSVSCR.

An example datafill follows.

	FROMDIGS	TODIGS		TMTOFRT
<i>current entry</i>	222	222	T	OFRT 804
<i>additional entry</i>	0222	0222	T	OFRT 804

Table TOPEACAR: to define carrier attributes

Table TOPEACAR associates CICs with carriers and defines basic attributes for up to 1,000 common carriers. This table's CARDIGS and ALTCARR fields expand from three digits to four digits (the CARDIGS field serves as the tuple key).

An example datafill follows.

TABLE: TOPEACAR									
CARDIGS	CARNAME	ALTDISP	OPLSCLD	CAMABILL	ALTCARR	NATERM	INTERM	OPSERV	
0234	CARR1	CARR1	Y	Y	0234	UNREST	UNREST	NOSERV	N N
0789	CARR2	CARR2	Y	Y	0789	UNREST	UNREST	NOSERV	N N

To save the network provider time, the DMS system converts (at a dump and restore) an office's current carrier datafill to four digits automatically by adding a leading zero to any three-digit entries. This means the CARDIGS and ALTCARR fields do not need to be changed manually, except when adding new carriers into the table (four-digit CICs required).

Table TOPEATRK: to define TOPS trunk groups

Table TOPEATRK defines TOPS trunk groups and associates them with carriers, end offices, and other attributes. This table's CARRIER field expands from three digits to four digits.

An example datafill follows.

TABLE: TOPEATRK										
TRUNKGRP	ENDOFFCE	CARRIER	LATANM	INTRASSC	INTERSSC	OVSSCL	SCRNIDX	DNLOOK	DFLT	PIC BYPASS
GENTRK1	CONFORM	0789	L123	STRA	STER	SOVS	919	Y	Y	\$
GENTRK2	CONFORM	NNNN	L321	STRA	STER	SOVS	803	Y	Y	\$

The DMS system converts (at a dump and restore) an office's current carrier datafill to four digits automatically by adding a leading zero to any three-digit entries. An exception to this is any entry of the placeholder 'N' (an existing entry of NNN will be converted to NNNN). With this dump and restore feature, the CARRIER field does not need to be changed manually, except when adding new carriers into the table (four-digit CICs required).

Table BRANDANN: to assign NBEC announcements

Table BRANDANN's CARNBEC field, the tuple key, expands from one to two parts. Original table control assumed that all tuples with values less than 1,000 (excluding 0000) were carrier codes, and all tuples at 1,000 and higher were NBEC (Non-Bell Exchange Carrier) codes. With the expansion of valid CICs to all be four digits long, a new key had to be added to differentiate CIC and NBEC numbers. To do this, CARNBEC now has two parts: the original four-digit field, plus a second field to identify each entry as either "CARR" or "NBEC".

An example datafill follows.

TABLE: BRANDANN					
CARNBEC		TAANN	TACLLI	DAANN	DACLLI
0000	NBEC	Y	TOPSBRND1	N	
0789	CARR	Y	TOPSBRND2	Y	TOPSBRND2
1234	NBEC	Y	TOPSBRND3	Y	TOPSBRND3

The DMS system will automatically assign "CARR" and "NBEC" (at a dump and restore) to an office's current carrier datafill. All existing entries receive a "NBEC" label-except for tuple keys within the range of 0001 to 0999, which receive the "CARR" label. With this dump and restore feature, the CARNBEC field does not need to be changed manually, except when adding new entries into the table. The table accepts up to 200 unique tuple key entries in the first part of the CARNBEC field.

Tables EAACTSAN and EAMCCSAN: to assign carrier announcements

The EAACTSAN and EAMCCSAN both contain an EACARNUM field, the tuple key, that expands from three digits to four digits. The following are example datafills.

TABLE: EAACTSAN		
EACARNUM	CORRECTDP	OVERDEP
0234	ACTSTOPS 1	ACTSTOPS 1
0789	ACTSTOPS 2	ACTSTOPS 2
TABLE: EAMCCSAN		
EACARNUM	INITINDX	
0234	MCCSTOPS 1	
0789	MCCSTOPS 2	

The DMS system converts (at a dump and restore) an office's current carrier datafill to four digits automatically by adding a leading zero to any three-digit entries. This means the EACARNUM field (in tables EAACTSAN and EAMCCSAN) does not need to be changed manually, except when adding new carriers into the tables (four-digit CICs required).

4.4 OFFICE PARAMETERS IMPACTED BY THE FGD CIC EXPANSION

The FGD CIC Expansion plan changes TOPS_OTC_CARRIER_NUMBER (an existing office parameter) and adds FOUR_DIGIT_CIC_STATUS (a new office parameter).

TOPS_OTC_CARRIER_NUMBER: to define office OTC carrier

In table OFCVAR, office parameter TOPS_OTC_CARRIER_NUMBER (used to define the Operating Telephone Company carrier for an entire office) expands from three to four digits. The DMS system converts (at a dump and restore) a three-digit entry here to four digits automatically by adding a leading zero.

The following is an example datafill of this office parameter.

<u>PARMNAME</u>	<u>PARMVAL</u>
TOPS_OTC_CARRIER_NUMBER	0789

FOUR_DIGIT_CIC_STATUS: to control digit interpretation

A new office parameter, FOUR_DIGIT_CIC_STATUS, specifies at which phase in the FGD CIC Expansion the office is currently operating. Translations use this office parameter to determine which digit sequences are currently valid. Added to table TOPSPARM, this office parameter permits one of three states, following the phased conversion transitions:

1. **THREEDIG**
This default state instructs translations to accept only three-digit CICs. This is intended for use *before* the permissive dialing period.
2. **PERMISSIVE**
This is the valid setting during the permissive dialing period. Both three-digit and four-digit CICs will be accepted.
3. **FOURDIG**
This is the valid setting when the permissive period ends. With this setting only four-digit CICs will be accepted.

The following is an example datafill of this new office parameter.

<u>PARMNAME</u>	<u>PARMVAL</u>
FOUR_DIGIT_CIC_STATUS	THREEDIG

4.5 TOPS IMPLEMENTATION

Activation to the Permissive Dialing Phase

During the permissive dialing period, a DMS-200 TOPS will process both three-digit and four-digit CICs. The actual procedures involved in preparing the office to progress from current CIC formats to the permissive dialing formats follow. The first three steps can be completed in any order.

1. The standard pretranslator, table STDPRTCT, subtable STDPRT, needs to have seven-digit entries keyed in for all six-digit domestic entries, and ten-digit entries keyed in for all nine-digit international entries in the form:

	Domestic format	International format
Current entry	0ZZ-XXX	1NX-XXX-CCC
Additional entry	0ZZ-0XXX	1NX-0XXX-CCC

Note that international tuples are often entered without the country code (CCC in the above table), yet still show “10” in the minimum and maximum digit size fields.

2. Four-digit CIC entries need to be manually added to table CLSVSCRC, subtable CLSVSCR so that its contents duplicate the entries found in table STDPRTCT, subtable STDPRT.
3. As detailed in Section 3, *DMS-200 Plan*, pertinent Trunk CLLI values need to be added to table CICSIZE4 for those trunk groups that will carry four-digit CIC traffic. Continue to revise table CICSIZE4 as additional trunk groups transfer to the four-digit CIC code in conjunction with the EAEO.
4. Office parameter FOUR_DIGIT_CIC_STATUS needs to be set to PERMISSIVE.

Please note that in the process of completing a dump and restore procedure, tables TOPEACAR, TOPEATRK, EAACTSAN, and EAMCCSAN update to four-digit CICs automatically, as well as the OTC carrier in office parameter TOPS_OTC_CARRIER_NUMBER. Also, the restore updates table BRANDANN by adding carrier and NBEC labels in the second part of the CARNBEC field.

Activation to the Final Conversion Phase

When the permissive dialing period ends, all subtending EAEOs will send four-digit CICs only. The actual procedures involved in preparing a DMS-200 TOPS to progress from permissive dialing CIC formats to the final dialing format follow. The first three steps can be completed in any order.

1. Manually delete six-digit entries (of the form 0ZZXXX) and nine-digit entries (of the form 1NX-XXX-CCC, where CCC is optional) from subtable STDPRTCT.STDPRT. Only seven-digit domestic entries and ten-digit international entries are valid.
2. Now that only four-digit CICs are valid, manually delete all three-digit CIC entries from table CLSVSCRC, subtable CLSVSCR. This table’s contents must duplicate the entries found in table STDPRTCT, subtable STDPRT.
3. As detailed in Section 3, *DMS-200 Plan*, now that all trunk groups carry four-digit CICs, the office parameter EA_TAB_CICSIZE4_OBSOLETE should be set to “Y”.
4. Office parameter FOUR_DIGIT_CIC_STATUS needs to be set to FOURDIG.

5.0 *Additional Changes to E800/PVN*

Impact of NTX186AB and NTX386AB on E800 and PVN Services at EAEO and AT Offices

This section discusses the additional impacts that software packages NTX186AB and NTX386AB have on translations for Enhanced 800 (E800) and Private Virtual Network (PVN) applications. These packages will support changes to E800 and PVN through feature AN0173, currently scheduled to be generally available in the BCS36 stream by April 1994.

5.1 INTRODUCTION

Due to the changes made for CIC Expansion, some datafill is required to allow E800 and PVN applications to continue to function correctly. These two services depend on CCS7 signaling for database transactions. The following is the recommended sequence of changes for these CCS7 network elements to accommodate the FGD CIC Expansion plan:

1. Convert Service Control Point (SCP) database and Service Management System (SMS) to store both three-digit and four-digit CICs. During the permissive dialing period the SCP will respond with either three-digit or four-digit CICs when queried by Service Switching Points (SSPs) and Operator Services Systems.
2. Convert access tandems, serving as SSPs, to accept four-digit CICs from the SCP.
3. Convert EAEOs, serving as SSPs, to accept four-digit CICs from the SCP.
4. When the permissive dialing period ends, network elements will accept and send four-digit CICs only.

Feature AN0173 enables the end office SSP or access tandem SSP to accept four-digit CICs from the SCP. The following changes to tables and office parameters are required *in addition* to the changes required of the EAEO or AT office discussed earlier in this document.

5.2 IN THE SSP

Presently, the E800 or PVN SSP expects to receive a three-digit CIC from the network provider's database (SCP). To have the SSP request and accept four-digit CICs from the SCP, one change is needed to the existing Transaction Capabilities Application Part (TCAP) requirements.

The SSP uses TCAP to communicate with the SCP to obtain routing and billing information. An SSP office sends a *TCAP Query* package containing the called number, calling number, and application-specific information. The SCP returns a *TCAP Response* package containing call routing and billing information. Presently, the call routing information contains three-digit CICs.

TR-NWT-001050 changes the TCAP requirements for the E800 and PVN SSP by adding an additional parameter, called the "CIC Expansion Indicator Parameter" to the TCAP Query package. The presence of this parameter in the TCAP Query package informs the SCP that a four-digit CIC needs to be returned in the TCAP Response package.

The capability to include the "CIC Expansion Indicator Parameter" in the TCAP Query package is determined by the datafill in table NSCDEFS, discussed in Section 5.4.

5.3 IN THE SCP

The network provider must update the SCP so it is capable of accepting and responding to requests for four-digit CICs, while continuing to accept and respond to requests for three-digit CICs from non-converted SSPs during the permissive dialing period.

The SCP database must be upgraded before an SSP E800 or PVN application can be upgraded to four-digit CICs, as discussed on the following pages.

5.4 SSP TABLES IMPACTED BY THE FGD CIC EXPANSION

The FGD CIC Expansion affects the following tables in end office and access tandem SSPs.

Table NSCDEFS: to request three-digit or four digit CICs from the SCP

The DMS software looks at the datafill for table NSCDEFS to decide whether to request a four-digit or three-digit CIC from the SCP. The DMS software expects to receive three-digit CICs from the SCP until the “4DGTCIC” option is datafilled. The addition of this option causes the DMS software to append the “CIC Expansion Indicator Parameter” to the TCAP Query package, and to expect four-digit CICs in the TCAP Response package.

The upgrade of an SSP E800 or PVN application to four-digit CICs completes on a per-application basis, as opposed to a per-link basis. As discussed in Section 5.3, the network provider must ensure that the SCP is capable of accepting and responding to the request for four-digit CICs before upgrading an application to four-digit CICs, otherwise all traffic for that application will fail.

After adding 4DGTCIC into this table, the subsystem may need to be set to BSY, then RTS—depending on the SSP service:

- The **E800 subsystem** at the SCCPLOC level of the MAP must be set to BSY, then RTS, before the TCAP Query package coding changes will take effect.
- The **PVN subsystem’s** TCAP Query package coding changes immediately. No BSY/RTS procedure is required.

The following is an example datafill in NSCDEFS for an Enhanced 800 application.

NSCODE	TIMEOUT	OPTIONS
E800	3	
(NSC0ZZ 078)	(NSC1NX 178)	(NSCNUM 800)
(4DGTCIC)	\$	

Table OCCINFO: to datafill CIC codes

Equal Access End Offices will be able to outpulse a four-digit CIC for E800 and PVN calls that route to the AT SSP to perform database queries. With BCS36, a special CIC can be datafilled in table OCCINFO (usually “0110”) at the access tandem for these calls.

Table STDPRTCT.STDPRT: for carrier information

Feature AN0173 impacts table STDPRTCT, subtable STDPRT, in the following ways.

► **Addition of four-digit CICs**

Four-digit CICs, corresponding to those entries for three-digit CICs for FGD carriers, must be entered into table STDPRT for four-digit CICs. The following table specifies the valid formats for these additional entries.

Location	Call type	3-digit CIC format	Modified for 4-digit format
EAEO SSP	national	10XXX + 1 + called number	101XXXX + 1 + called number
	international	10XXX + 011 + CC + NN	101XXXX + 011 + CC + NN
AT SSP	national	0ZZXXX + called number	0ZZXXXX + called number
	international	0ZZXXX + CC + NN	0ZZXXXX + CC + NN

where: *Xs* *CIC Digit* *CC* *Country Code*
 0ZZ *Toll Center Code* *NN* *National Number*

► **Expansion of T-pretranslator route selector**

The T-pretranslator route selector, used to route E800/PVN calls to the IC, expands to allow a maximum count of 25 digits to be datafilled in the MAXDIGSR field for the T selector.

Below is an example datafill in subtable STDPRT using the T selector and a four-digit CIC.

TABLE: STDPRTCT TEST: STDPRT			
FROMDIGS	TODIGS	PRETRTE	
1780999	1780999		
	T NP 7	OFRT 885 14 19	NONE

► **Expansion of NSC selector**

The access tandem translates on the 0ZZXXX digits received from EAEOs using the Number Services Calls (NSC) selector in subtable STDPRTCT.STDPRT. The selector identifies the call as either E800 or PVN. Previously only six digits could be datafilled using the NSC selector; with feature NC0428 (generally available with BCS35, in NTX386AB) both 0ZZXXX and 0ZZXXXX formats are valid. The following is an example datafill.

Table STDPRTCT, subtable STDPRT:								
	FROMDIGS	TODIGS	PRETRTE					
<i>current entry</i>	092110	092110	NSC	DD	6	6	PVN	NA
<i>additional entry</i>	0920110	0920110	NSC	DD	7	7	PVN	NA

5.5 SSP OFFICE PARAMETER IMPACTED BY THE FGD CIC EXPANSION

The FGD CIC Expansion affects the following office parameter, for E800/PVN services.

SSP_NSC_CARRIER_ID: for E800/PVN call routing

Also affected by feature AN0173 is office parameter `SSP_NSC_CARRIER_ID` (in table OFCENG). DMS software uses this parameter to determine where to route an E800 or PVN call, based on the digits returned in the TCAP Response package. Presently, a three-digit service code can be datafilled for `SSP_NSC_CARRIER_ID`. Feature AN0173 allows the office parameter to hold a four-digit service code. Thus, a four-digit CIC code returned in the TCAP Response package can be compared directly to the four-digit service code datafilled in office parameter `SSP_NSC_CARRIER_ID`. If an unconverted E800 SCP returns a three-digit CIC to a converted SSP, then the DMS software inserts a leading zero before the returned CIC is compared with the datafill for `SSP_NSC_CARRIER_ID`.

The new default value for office parameter `SSP_NSC_CARRIER_ID` is “0110”. This is the service code value recommended in TR-NWT-001050. Previously, the three-digit default service code value was “110”.

5.6 IMPACT ON OPERATIONS

If the SSP requests a three-digit CIC from the SCP and the SCP returns a four-digit CIC-or the SSP requests a four-digit CIC from the SCP and the SCP returns a three-digit CIC-the call will be routed to TCAP treatment, and a TCAP Unidirectional package, with a Return Error component, will be sent to the SCP.

Also, the format of the output for the TESTSS command (made at the SCCPLOC level of the MAP to verify a database without making a test call) has been changed to print either a three-digit or four-digit CIC based on the size of the CIC received in the TCAP Response package.

6.0 *OA&M Impacts*

Anticipated Changes on Operations, Administration, and Maintenance

6.1 INTRODUCTION

This section discusses key OA&M impacts on DMS offices by the FGD CIC Expansion under the following topics:

- Engineering Section 6.2
- Real Time Impact Section 6.3
- Impact on Billing Section 6.4
- Impact on OMs Section 6.5
- Impact on Service Analysis Section 6.6
- Impact on Service Evaluation System Section 6.7
- Impact on Log Reports Section 6.8
- Impact on In-Service Time Section 6.9
- Other Considerations Section 6.10

6.2 ENGINEERING

The memory impact of the new CIC Expansion software is negligible, as shown below.

- Office parameter EAEO_FOUR_DIGIT_CIC_STATUS requires one word of data store
- Office parameter EA_TAB_CICSIZE4_OBSOLETE requires one word of data store
- Table CICSIZE4 has a new data store requirement of 512 words. The memory impact is static (that is, the memory requirement remains at this level no matter how many tuples are configured)
- Table LEAS_FOUR_DIGIT_CIC_STATUS requires one word of data store
- Table OCCINFO and subtable STDPRTCT.STDPRT do not require additional data store

6.3 REAL TIME IMPACT

Across the full range of different call types, the real time impact of the new FGD CIC Expansion software processing consumes from a minimum of 0.5% to a maximum of 5% of call processing time.

6.4 IMPACT ON BILLING

To accommodate both three-digit and four-digit CICs, Automatic Message Accounting (AMA) records have expanded.

With BCS35, feature NC0428 (in software packages NTX186AB and NTX386AB) modifies the standard interexchange AMA record to accommodate four-digit CICs. Specifically, characters one to four in the IC/INC prefix identify a carrier. Previously, the first character was padding (0) only. Character 5 (the low-order character) retains a value that indicates whether the call was direct dialed or was a request to an IC/INC operator.

The following is the format for Interexchange Carrier/International Carrier Prefix (Table 57):

Format for IC/INC Prefix

BCD character	Meaning
1 through 4	IC/INC Identification
5	0 = Operator Involved 1 = Direct Dialed 2 = Undetermined
6	SIGN (Hexadecimal C)

As of BCS35, the billing records that include the IC/INC prefix include:

Call Codes in BCS35 Affected By FGD CIC Expansion

Call code	Description
110	InterLATA Station Paid
111	InterLATA WATS Station Detail
113	InterLATA WATS Automatic Flexible Routing to Direct Distance Dialing
114	InterLATA WATS Billing Number
115	InterLATA WATS Automatic Flexible Routing to Direct Distance Dialing
117	InterLATA Circuit Switched Digital Capability (CSDC), such as Datapath
119	Terminating Access Record
120	Originating LATA Overflow Counts, kept for each IC/INC
121	CSDC (Datapath) Terminating Access Record

Feature AN0173 (scheduled for general availability with BCS36 in both NTX186AB and NTX386AB) the following billing records will also include the IC/INC prefix:

Additional Codes in BCS36 Affected By FGD CIC Expansion

Call code	Description
021	Generated for Private Virtual Network calls that complete to the IC/INC
141	Generated for Enhanced 800 calls that complete to the IC/INC

The following is an example AMA record for an originating FGD call from a POTS line. The IEC/INC PREFIX field contains the four-digit code.

```
HEX ID: AA   STRUCTURE CODE: 0065C   CALL CODE: 110C
SENSOR TYPE: 036C   SENSOR ID: 0000000C   REC OFFICE TYPE: 036C
REC OFFICE IF:0000000C   DATE:00604C   TIMING IND: 00000C
STUDY IND: 0000000C   ANSWER:0C   SERVICE OBSERVED:0C
OPER ACTION: 0C   SERVICE FEATURE: 000C   ORIG NPA: 613C
ORIG NUMBER: 6211233C   OVERSEAS IND: 1C   TERM NPA: 00613C
TERM NUMBER: 8881234C   ANSWER TIME: 1423651C
ELAPSED TIME: 000000015C   IEC/INC PREFIX: 12341C   CC
DATE: 00504C
CC TIME: 1345623C   ELAPSED CC: 000000023C   IEC/INC
EVENT STATUS:010C   TRUNK GROUP NUMBER: 00230C
ROUTING INDICATOR: 0C   DIALING INDICATOR: 7C   ANI INDICATOR: 1C
```

6.5 IMPACT ON OMS

FGD CIC Expansion does not change the function or operation of operational measurements (OMs). The DMS system uses specific OM groups to capture and generate information about carriers, trunk groups, and calls. The DMS gathers this information through scans of equipment components and activities and stores the data in registers. From these registers reports can be made so network provider personnel monitor and evaluate overall system performance.

6.6 IMPACT ON SERVICE ANALYSIS

The change in CAC format from five to seven digits impacts table SAUSERS, used by the Service Analysis (SA) system. The impact is transparent in BCS35, and does not require its own separate datafill until the permissive dialing period ends.

SA serves as a telephone observation system to help the network provider appraise the quality of service. SA permits monitoring, on a random basis, to evaluate the service provided at the host office and the surrounding switching network. Monitor links can be co-located with the host DMS switch or be accessed remotely. A service analyst at a remote location receives a monitor link by sending a data request to the DMS, and then answering a telephone call back to the analyst's location initiated by the DMS system.

SA dialback over ATC trunks for FGD calls involves table SAUSERS, which contains the PIC (Primary InterLATA Carrier) carrier names referenced by the DMS software to initiate callbacks. PICs will be prefixed with "10" or "101" depending on the setting of the office parameter EAEO_FOUR_DIGIT_CIC_STATUS.

TABLE: SAUSERS

KEY	USER						SAMODATA
0	OPERATOR	REM	NOCAR	6211234	8673456	518	NPRT
1	B	REM	CAR1	6211212	9664567	613	NPRT
2	D	REM	CAR2	6211234	9213456	519	NPRT
3	F	LOCL					HSET 0
4	I	LOCL					HSET 0
5	H	LOCL					HSET 0
6	L	LOCL					HSET 0
7	K	LOCL					HSET 0
8	M	REM	CAR3	8312345	7654321	518	NPRT
9	N	REM	CAR4	8311342	6543210	613	NPRT

PIC field →

When the permissive dialing period ends, and EAO_FOUR_DIGIT_CIC_STATUS is datafilled to FOURDIG, previous remote entries in table SAUSERS need to be deleted and re-entered.

6.7 IMPACT ON SERVICE EVALUATION SYSTEM

The change in CIC format from three to four digits impacts the Service Evaluation System (SES). Minimal datafill permits correct CIC digits to be passed from the DMS to the SES.

The DMS collects and updates call details that are sent, in the form of messages, to the SES. A portion of SES's CALL DETAILS and CALL DETAILS UPDATE messages contains the InterLATA Carrier Prefix. The example below is a SES CALL DETAILS message with a four-digit IC shaded.

Example SES CALL DETAILS Message

Message ID (25)		Voice Link		Call Type		Orig Class	
Time Tag for Call Selection							
Time Tag for Call Disposition							
Incoming Trunk Group				Incoming Trunk Member			
Bridge State		Call Disp					
		DN0		DN2	DN1	DN4	DN3
DN6	DN5	DN8	DN7	DN10	DN9	DN12	DN11
IC2	IC1	IC4	IC3	Treatment		Billable	

No direct modifications to these message structures are required as there is room for an extra carrier digit, as shown above. The only change required is to insert the extra digit in the correct offset in the message structure so SES will receive either three-digit or four-digit CICs from the DMS system.

6.8 IMPACT ON LOG REPORTS

Log reports notify maintenance personnel to significant events that occur during the operation of the DMS system. The following are some log reports associated with FGD CIC Expansion. The first two logs, DFIL110 and DFIL111, are specific to E800 and PVN services only.

- | | |
|---------|--|
| DFIL110 | Updated to show four-digit CICs, this log appears if no entry exists in table OCCINFO for the CIC returned from the SCP. |
| DFIL111 | Updated to show four-digit CICs, this log appears if an entry is found in table OCCINFO but the Access field is datafilled as "None". |
| DFIL145 | Generated by the AT switch if a four-digit CIC is received from the EAEO over a trunk group that supports three-digit CICs. A trunk group is considered to support three-digit CICs if it is not datafilled in table CICSIZE4 and office parameter EA_TAB_CICSIZE4_OBSOLETE is set to N. This log has been added by feature NC0428 in BCS35. |
| DFIL146 | Generated by the AT switch if a three-digit CIC is received from the EAEO over a trunk group that supports four-digit CICs. A trunk group is considered to support four-digit CICs if it is datafilled in table CICSIZE4 or the office parameter EA_TAB_CICSIZE4_OBSOLETE is set to Y. This log has been added by feature NC0428 in BCS35. |
| DFIL147 | Generated by the EAEO or AT switch if the call attempts to outpulse a four-digit CIC with a non-zero leading digit over a trunk group that supports three-digit CICs. A trunk group is considered to support three-digit CICs if it is not datafilled in table CICSIZE4 and office parameter EA_TAB_CICSIZE4_OBSOLETE is set to N. This log has been added by feature NC0428 in BCS35. |
| DFIL122 | Generated by the AT switch when the IAM received from the EAEO over a CCS7 intertoll trunk group contains a TNS parameter that has no corresponding entry in table CKTDIGIT. The DMS software checks table CKTDIGIT to derive the 0ZZ/1NX digits based on the circuit code received in the TNS parameter. |

6.9 IMPACT ON IN-SERVICE TIME

Translation changes for FGD CIC Expansion cause limited out-of-service time in the following situations:

- Extended Peripheral Modules (XPMs) for end offices need to be reset when there is a change to the EAEO_FOUR_DIGIT_CIC_STATUS office parameter (see Sections 2.9 and 2.10)
- The subsystem for E800 or PVN needs to be reset when the 4DGTIC option is added to table NSCDEFS (see Section 5.4).

6.10 OTHER CONSIDERATIONS

Expanding CIC codes to four-digits impacts many operations systems created and maintained by the network provider, including in-house provisioning systems, maintenance operations systems, billing systems, traffic data collection systems, and network management operations systems. Allowances for four-digit CICs need to be made for Field Identifiers (FIDs), Access Number (AN), Automatic Number Identification (ANI), International Carrier Option (INCO), and Numeric Interexchange Carrier Identification codes passed from service orders to various in-house databases and systems used for processing, provisioning, maintenance, and billing.

7.0 End User Impacts

This section describes how the FGD CIC Expansion plan is expected to impact subscribers across the network.

7.1 WHICH END USERS AFFECTED

Subscribers who rely on their presubscribed PICs (Primary InterLATA Carriers) to complete InterLATA calls will experience no change throughout the FGD CIC Expansion. The plan affects only those subscribers who designate a common carrier by dialing a CAC at the start of a call.

The change from five-digit CACs to seven-digit CACs will be completed gradually (on a per-trunk or per-link basis) across the network-to allow some time for subscribers to become aware of the CAC format change and to develop new calling habits. The permissive dialing period permits both five-digit and seven-digit CACs, so not all subscribers for an end office have to convert at the same time during the transition period. Indeed, because both CAC dialing formats are valid, the end user does not necessarily need to know an end office has entered a limited “permissive dialing” period. Only until the permissive dialing period ends will all subscribers be required to change to the new CAC formats to avoid call treatment.

7.2 INFORMING END USERS

Many subscribers will rely on their common carrier for instructions on how (and when) to dial the new CACs. However, the network provider may want to keep subscribers informed on local developments, such as end office readiness-especially if a particular end office’s conversion into the permissive dialing phase is relatively late. Also, reminding subscribers ahead of time how seven-digit CACs affect various services in their control (such as interLATA call forwarding) will reduce frustrated subscriber inquiries when the network enters the final conversion phase (see Section 7.3, below).

Any materials the network provider produces for the subscriber or calling public should be examined for potential impacts. The products involved range from advertising to the instructions printed on pay phones.

7.3 IMPACT ON END USERS

As before, if a CAC is not specifically dialed by a caller, the customer’s line is checked for presubscription to a PIC and handled accordingly. If a CAC *is* specifically dialed by a caller, then-as long as permissive dialing is in effect-the end office accepts, interprets, and routes both five-digit and seven-digit CAC formats, reconciling prefix differences to match outgoing trunk group signaling.

The end of the permissive dialing period marks the time subscribers are obligated to use the seven-digit CACs only. While most subscribers will understand that this change affects CACs manually dialed at the beginning of a call, many may not be immediately aware that the change also affects automated services in their control.

For example, a personal computer might have a fax application that contains in its user-configurable software a CAC as part of speed-calling through a modem for transmission to an often-called location in another LATA. Because the calls are initiated by keyboard commands or mouse clicks, the user can easily forget that CAC digits are involved.

On premises-based and end office-based services that are impacted by the CAC format change include:

- On-premises terminal- or computer-based speed dialing features
- End office-based speed dialing features
- On-premises terminal- or computer-based electronic directory features
- InterLATA Call Forwarding
- InterLATA Call Transfer
- Three-Way Calling

7.4 IMPACT ON MERIDIAN DIGITAL CENTREX

Impact on dialing plan

Expanding the number of CAC digits from five to seven limits the maximum number of Meridian Digital Centrex (MDC) prefix digits used for international calls from three to two. This is required because dialing a four-digit CAC and making an international call using more than two digits will overflow the 24-digit register and can cause the call to fail.

Impact on MDC features

The MDC features that are internal to the MDC environment (such as Direct Inward Dialing) and MDC features that are on the terminating side of POTS calls (such as Call Waiting) are not impacted by FGD CIC Expansion.

The outgoing user-configurable features that *are* impacted by the FGD CIC Expansion plan include:

- Three-Way Calling
- Speed Calling 1 and 2
- Network Speed Calling
- Six-Party Conference
- Call Forwarding
- Call Transfer
- Custom Calling
- Direct Inward System Access
- Automatic Route Selection

8.0 Acronyms

The following acronyms and abbreviations appear more than once in this document.

AMA	Automatic Message Accounting
AT	Access Tandem
ATC	Access-to-Carrier trunk
BCS	Batch Change Supplement
Bellcore	Bell Communications Research
CAC	Carrier Access Code
CCS7	Common Channel Signaling System No. 7
CIC	Carrier Identification Code
CLLI	Common Language Location Identifier
CSDC	Circuit Switched Digital Capability
DMS	Digital Multiplex System
E800	Enhanced 800 service
EAE0	Equal Access End Office
EAIT	Equal Access Intermediate Tandem
EASP	Equal Access Alternate Switching Point
FGB	Feature Group B
FGD	Feature Group D
IAM	Initial Address Message
IC	InterLATA Carrier
INC	International Carrier
ISDN	Integrated Services Digital Network
LATA	Local Access and Transport Area
LEAS	Local Access and Transport Area Equal Access System
MAP	DMS-100 Maintenance and Administration Position
MDC	Meridian Digital Centrex
MF	Multifrequency
NBEC	Non-Bell Exchange Carrier
NSC	Number Services Calls
NTP	Northern Telecom Publication
OA&M	Operations, Administration, and Maintenance
OCS	Overlap Carrier Selection
OM	Operational Measurement
PBX	Private Branch Exchange
PIC	Primary InterLATA Carrier
POTS	Plain Old Telephone Service
SA	Service Analysis
SCP	Service Control Point
SES	Service Evaluation System
SMS	Service Management System
SSP	Service Switching Point
TNS	Transit Network Selection
TOPS	Traffic Operator Position System
WATS	Wide Area Telephone Service
XPM	Extended Peripheral Module

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