297-5151-022

DMS-100 Family

800Plus and End-Office Display

Service Guide

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NORTEL
NORTHERN TELECOM

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Updates to document format and presentation, with TRAVER output examples move to an appendix for better accessibility.

August 1997

Standard 01.01 First standard release of this document for NA006.

Contents

About this document

This document describes the 800Plus and end-office display (EOD) implementation on the SSP. It includes the following information:

- a description of the service
- engineering data
- datafill requirements for both toll-free numbers and EOD
- monitoring of the service
- maintenance for the service
- examples of TRAVER outputs that are relevant to the service

How to check the version and issue of this document

The version and issue of the document are indicated by numbers, for example, 01.01.

The first two digits indicate the version. The version number increases each time writers update the document to support a new software release. For example, the first release of a document is 01.01. In the next software release cycle, the first release of the same document is 02.01.

The second two digits indicate the issue. The issue number increases each time writers revise and rerelease the document in the same software release cycle. For example, the second release of a document in the same software release cycle is 01.02.

To determine which version of this document applies to the software in your office and how documentation for your product is organized, check the release information in the *Product Documentation Directory*, 297-8991-001.

References in this document

This document references the following Northern Telecom publications:

- *DMS-100 Advanced Intelligent Network Service Enablers Service Implementation Guide*, 297-5161-022
- *DMS-100 Advanced Intelligent Network Essentials Service Implementation Guide*, 297-5161-021
- *DMS-100 Family Glossary of Terms and Abbreviations Reference Manual*, 297-1001-825
- *DMS-100 Family Local Routing Number-Local Number Portability Service Implementation Guide*, 297-8981-021
- *Log Report Reference Manual*
- *Meridian Digital Centrex Simplified Message Desk Interface Set-up and Operation*, 297-2051-104
- *Office Parameters Reference Manual*
- *Operational Measurements Reference Manual*
- *SERVORD Reference Manual*
- *Translations Guide*

What precautionary messages mean

The types of precautionary messages used in Nortel (Northern Telecom) documents include attention boxes and caution, warning, and danger messages.

An attention box identifies information that is necessary for the proper performance of a procedure or task, or the correct interpretation of information or data. Caution, warning, and danger messages indicate possible risks.

Examples of the precautionary messages follow.

ATTENTION Information needed to perform a task

> If the unused DS-3 ports are not deprovisioned before a DS-1/VT Mapper is installed, the DS-1 traffic will not be carried through the DS-1/VT Mapper, even though the DS-1/VT Mapper is properly provisioned.

CAUTION Possibility of service interruption or degradation

Possible loss of service
Before continuing, confirm that you are removing the card from the inactive unit of the peripheral module. Subscriber service will be lost if you remove a card from the active unit.

WARNING Possibility of equipment damage

WARNING
Damage to the backplane connector pins
Align the card before seating it, to avoid bending the backplane connector pins. Use light thumb pressure to align the card with the connectors. Next, use the levers on the card to seat the card into the connectors.

DANGER Possibility of personal injury

Risk of electrocution
Do not open the front panel of the inverter unless fuses F1, F2, and F3 have been removed. The inverter contains high voltage lines. Until the fuses are removed, the high voltage lines are active, and you risk being electrocuted.

How commands, parameters, and responses are represented

Commands, parameters, and responses in this document conform to the following conventions.

Input prompt (>)

An input prompt (>) indicates that the information that follows is a command:

```
>BSY
```

Commands and fixed parameters

Commands and fixed parameters that are entered at a MAP terminal are shown in uppercase letters:

```
>BSY  CTRL  ctrl_no
```

Variables

Variables are shown in lowercase letters:

```
>BSY  CTRL  ctrl_no
```

The letters or numbers that the variable represents must be entered. Each variable is explained in a list that follows the command string.

Responses

Responses correspond to the MAP display and are shown in a different type:

```
FP 3 Busy CTRL 0: Command request has been submitted.
FP 3 Busy CTRL 0: Command passed.
```

The following excerpt from a procedure shows the command syntax used in this document:

Step	Action

1	Manually busy the CTRL on the inactive plane by typing
	>BSY CTRL ctrl_no
	and pressing the Enter key.
	where
	ctrl_nois the number of the CTRL (0 or 1)
	Example of a MAP response:
	`FP 3 Busy CTRL 0: Command request has been submitted.`
	`FP 3 Busy CTRL 0: Command passed.`

Chapter 1: Understanding toll-free number service

Use the information provided in this chapter to understand how basic toll-free number service works and how 800Plus software interacts with other features.

This chapter includes the following sections:

1.1 What is toll-free number service?

Toll-free calls are a number service code (NSC) feature that enables service signaling point (SSP) offices to interface with operating company databases. Toll-free number service calls are identified by the first three digits that indicate the call requires special translations treatment. All of the digits are matched against a database entry indicating the routing digits to be used for call setup.

Toll-free calls can route based on the time of day, day of week, and location at which the call originates. Southbound calls can route to a carrier. The 800Plus subscriber gets billed for the toll-free call.

The functions of the SSP are as follows:

- provides the service control point (SCP) with calling and called directory numbers (DN)
- routes the calls to the destination DNs or treatment based on the response from the SCP
- provides network management at the request of the SCP through automatic call gapping (AGC)
- generates a billing record for the call

Available features for 800Plus toll-free number service include ten-digit routing, comfort tones, and, for southbound calls, four-digit carrier identification codes. The Nortel Networks 800Plus toll-free number service was tested, and based on Bellcore specification TR-TSY-000533, Issue 2.

Because of the success of toll-free number service, the national database using the special code 800 ran out of available numbers. To add numbers to support this service, the Industry Numbering Committee made 8XX available for 800Plus toll-free service codes. The XX numbers must be identical. Under this agreement, 888 is the first code to be used, leaving 822, 833, 844, 855, 866 and 877 on reserve for future expansion. The numbers 811 and 899 are not available.

1.2 Basic toll-free number service architecture

The toll-free number service uses operating company databases in a common channel signaling system 7 (CCS7) network architecture to determine the call destination (See Figure 1 and Figure 2). Offices in the network that communicate with these databases are configured as SSPs. An SSP communicates with an operating company database at an SCP using SS7. Thus, in an SS7 network the SSP is a node that launches queries to a database by way of a signaling transfer point (STP).

Usually, a toll office SSP serves as the switch for the SSP function. In most operating networks, the first SSP that a call reaches in the network launches a toll-free database query to the SCP, although this is not a requirement. An end office can also be equipped with SSP functionality.

Figure 1 SS7 network architecture with toll office SSP

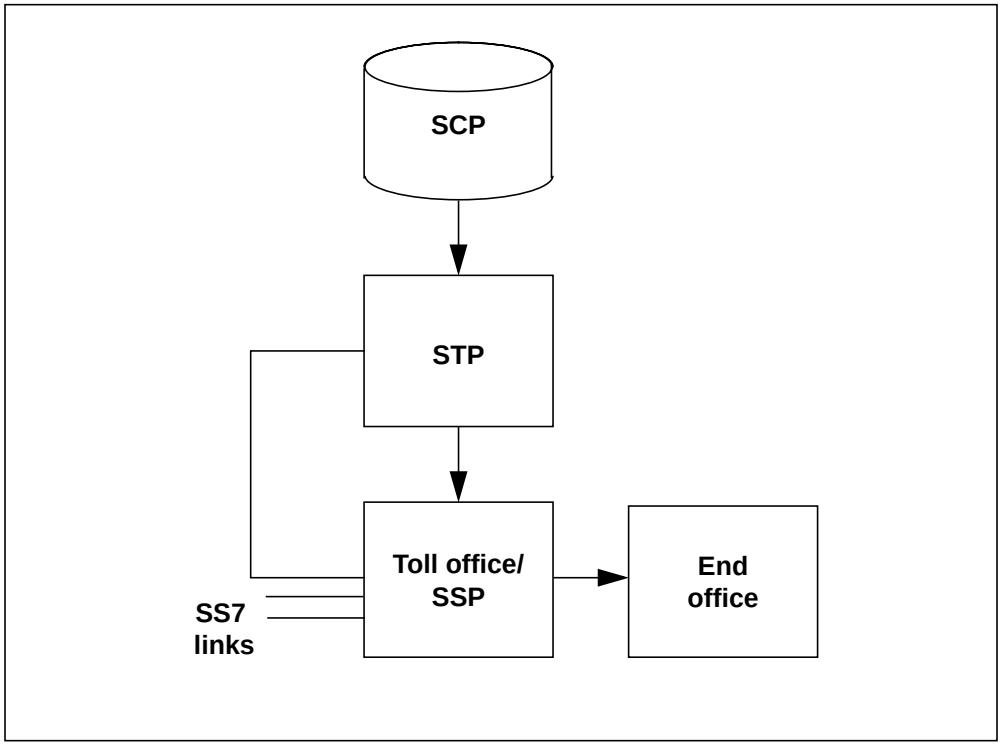
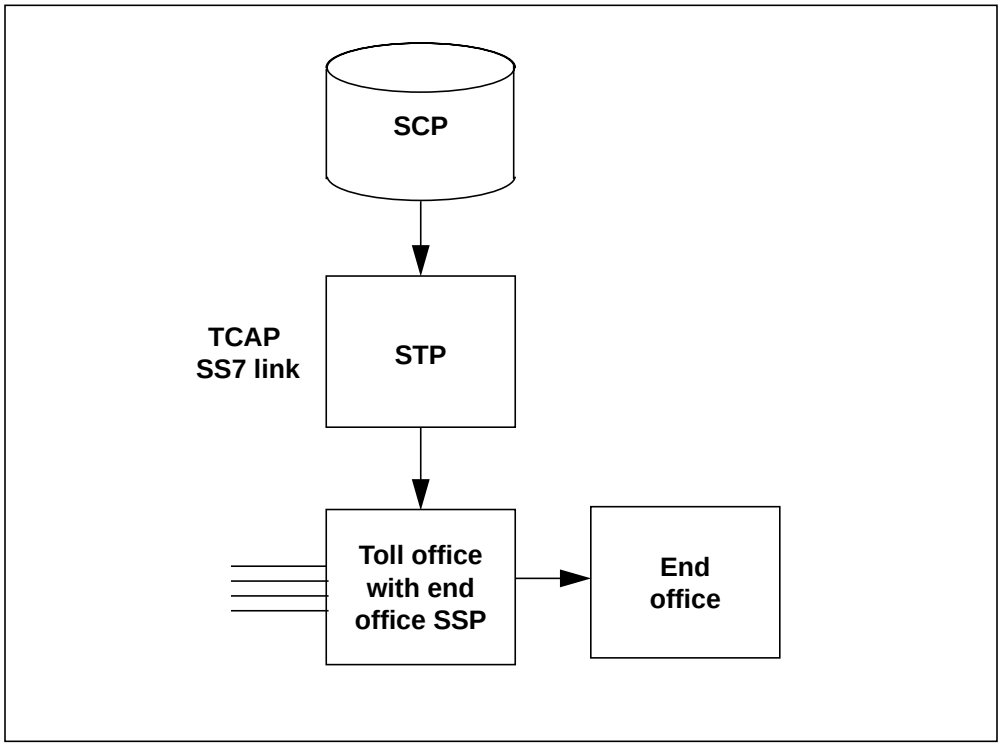


Figure 2 CCS7 network architecture with end office SSP



1.2.1 Principle call routes for toll-free traffic

In a fully operational network, there are three common ways for a toll-free call to access an SCP database for routing information:

- The call originates on a combined end office and toll office SSP.
- The call is routed from an end office to a toll office SSP (with or without an operator position).
- The call routes to a traffic operator position system (TOPS) SSP.

1.3 Caller access to toll-free services

A caller places a toll-free call by dialing a ten-digit number. The first three digits are a number services code and may be preceded with a 1 prefix, depending on local dialing arrangements. For example, toll-free services can be accessed by dialing leading digits 1-800 or 0-888. The digits that are dialed depend on the translation and numbering plan that is configured by the operating company administration. The call is recognized as a toll-free call during its translations stage.

1.4 Toll-free service capabilities

800Plus has many capabilities specific to the Canadian market beyond those detailed in Bellcore Specification TR533.

1.4.1 Basic 800

A Basic 800 service subscriber has a single terminating line that can receive toll-reversed calls from an area defined by a zone.

1.4.2 International 800

The International 800 functionality allows toll-free calls that are dialed in North America to terminate on Freephone access lines in countries outside North America.

1.4.3 Northbound

The Northbound functionality (also known as 800 Service - U.S.) lets 800 calls that originate from the continental U.S (including Alaska and Hawaii) terminate on a subscriber’s line in Canada. It also allows domestic callers outside the customer network to make toll-free calls to destinations inside the customer network.

1.4.4 Enhanced southbound

An Enhanced Southbound subscriber can specify an 800 number as a terminating number with the following advantages:

- Subscribers can use the SCP II to route toll calls to a domestic plain ordinary telephone service (POTS) during certain hours, and to a destination outside the customer network during other hours.
- Subscribers can also use the SCP II to route toll-free calls to number destinations outside the customer network.

1.4.5 Call prompter

The Call Prompter functionality lets toll-free callers select specific answering locations, using interactive prompts. Callers respond to prompts using the touch-tone buttons on their telephones. This functionality only works with ISUP connectivity. TOPS SSPs do not support Call Prompter.

1.4.5.1 Restriction

Originate all calls to Call Prompter functionality from a trunk; otherwise, use a local loop-around trunk. The trunks cannot belong to a customer group.

1.4.6 Courtesy response

The Courtesy Response functionality plays a voice announcement to toll-free number callers. The Enhanced Courtesy Response functionality can play a voice announcement to toll-free number callers and receive voice messages from callers. TOPS SSPs do not support Courtesy Response.

1.4.7 Call forward

The Call Forward functionality allows call forwarding to a toll-free number. The call originator pays for the call from the originating DN to the call-forwarding point.The 800Plus subscriber only pays for the leg of the call from the call forwarding point to the terminating toll-free DN.

1.4.8 Overflow call routing

The Overflow Call Routing (OCR) functionality specifies alternate terminating DNs for a toll-free number. Subscribers can select to divert calls when the primary toll-free number is busy, or does not answer. This functionality increases the completion rate for toll-free calls, providing the subscriber with more effective service. Each terminating line for an OCR subscriber can use 800Plus Basic Service.

1.4.8.1 OCR operation

When a toll-free number is dialed, the originating SSP sends a query to the SCP to obtain a terminating DN for the called number. With OCR, more than

one terminating DN may be returned from the SCP. There are two ways to invoke OCR.

Call overflow on busy (COB) uses ISUP and CCS7 connectivity to determine if the terminating DN is busy, and if so, invokes OCR to route to the next DN returned from the database. ISUP and CCS7 connectivity between the originating SSP and the terminating end office (EO) is required to take advantage of this functionality.

The SSP tries each terminating DN on the list, until it finds one that is idle.

Call overflow on no answer (CONA) uses a timer to determine that a given terminating DN is not answering, and if so, invokes OCR to route to the next terminating DN. The timer can be returned by the database, set in table NSCDEFS or defaults to 20 seconds. CONA works for both ISUP and MF trunks.

If the call is not answered before the last DN returned from the database is attempted, the call routes to the last DN and OCR is no longer applicable.

Note: 0- calls and hotel calls that go to a TOPS operator position for entry of the room number support OCR for COB only.

OCR does not affect the translation and routing of these DNs, except for the following:

- Call failure. If the SCP returns a standard or special announcement component (such as call failure), then the SSP routes the call to a treatment based on the returned treatment code. If the response from the SCP has invalid data, or if the SSP cannot decipher the message, then the call receives CCS7 application failure treatment.
- Inward Wide Area Telephone Service (INWATS). INWATS replaces OCR, if the routing number returns from the SCP as a ten-digit, toll-free number, or if the DN has a Special Routing Indicator transition number. This functionality only applies to 800, not 8XX toll-free calls.

  Note: Only include an INWATS number as the last number in an OCR series, in order to avoid cancelling OCR. Switching to INWATS also cancels the generation of toll-free accounting records after the switch.

1.4.8.2 OCR Limitations and restrictions

OCR has the following limitations and restrictions on other functionalities.

- If a translation error occurs during OCR routing, with OCR Busy active, call processing continues with the next route on the OCR list.
- OCR call processing terminates when
  - — the call is routed to an attendant console.
  - — with OCR Busy active, a call invokes the preset conference functionality.
  - — routing includes a PBX trunk.
  - — the call is routed to a hunt group or an ACD group that is local to the SSP that OCR is using.
  - — the call is routed to an ACD group with uniform call distribution (UCD).
  - — the route includes an international terminating line
  - — special routing indicator of US Assigned or transition is recieved
  - — an announcement is returned from the database
- The TAT trigger can be encountered on the last route only. Encountering the TAT trigger on a non-final route overflows the call to the next route.
- CONA OCR increases the post dial delay time. If all terminating DNs returned from the database are attempted, several minutes may elapse after initial dialing before the call routes to the last DN.
- OCR overflows the call to the next route when the current route has Call Forward Do not Answer (CFDA) features.

1.4.9 End-Office Display

For 800Plus toll-free calls, the End-Office Display (EOD) functionality provides a subscriber with a display of the toll-free dialed number ID (DNID), either alone, or with a display of the caller ID (CID). EOD requires CCS7 connectivity. The recipient DN also requires a subscription to the same EOD product, both on the terminating end office and the routing SCP.

DNID allows an 800Plus subscriber to identify that a toll-free DN is being dialed. If the subscriber has several 800Plus services, or multiple toll-free numbers, it also allows the subscriber to identify which service or toll-free number the caller selects.

CID provides the same functionality as calling number delivery (CND), except that CID identifies toll-free calls, and CND identifies the originating DN of a non-toll-free call.

EOD comes in two separate packages—Automatic Call Distribution (ACD)/Centrex, or Call Management Services (CMS). Though these are functionally separate, an operating company can install both services concurrently. In order to datafill EOD services, refer to Chapter 5, “Monitoring toll-free number service” in this document.

1.4.10 Limitations

The following known limitations affect 800Plus toll-free service capabilities:

- Network Ring Again (NRAG) does not work with 800Plus toll-free services.
- Virtual Facility Groups are only supported for plain ordinary telephone service (POTS) when making an 800Plus call.
- TOPS SSP does not support calls to or from a VFG.

1.4.11 Automatic call gapping

Automatic call gapping (ACG) provides a form of network management. An SSP reduces the number of queries that are sent to the SCP when the SCP appends an ACG signaling component to a response message.

An SCP number services application appends an ACG component when the application

- is overloaded
- detects mass calling to a number services destination
- receives a manual control initiation from a Service Management System (SMS)

The ACG message is a standard TCAP Invoke signaling component that identifies ACG as the operation code. The ACG Invoke component contains

the toll-free DN, the duration of ACG control, and the control gap time interval between each call. The ACG Invoke component also contains the reason for the call gapping. The tone or announcement that is provided to the subscriber when a call is blocked by ACG controls depends upon the cause for the ACG control.

Cause codes and their treatments if unanswered include the following:

- vacant code (VACT) generates a vacant code announcement
- unauthorized INWATS (UNIN) generates an out of band announcement
- SCP overload (NCRT) generates a no circuit announcement
- mass calling (BUSY) generates a 60 iterations per minute (ipm) tone
- operator support services (OSS)-initiated termination causes a reorder (RORD) treatment with a 120 ipm tone

The ACG feature can be totally enabled or disabled in the SSP through the use of the ACGTRL command.

1.4.11.1 ACG control for NSC type codes

To find out the ACG settings for each cause, issue the ACG800 CI command. The format is

```
ACG800 DIGNUM
```

where

DIGNUM is SIX_DIGIT, TEN_DIGIT or ALL

The system responds with

```
800-code CAUSE DURATION GAP
```

where

800-code	is SIX_DIGIT, TEN_DIGIT or ALL
CAUSE	is one of the causes listed in Section 1.4.11
DURATION	is the duration for which the ACG control is on (in units of seconds)
GAP	is the time interval between each call that is allowed to make an SCP query (in units of 10 ms)

1.5 Billing

An SSP automatic message accounting (AMA) billing record is generated on every answered SSP toll-free call at termination. When a toll-free number services call is dialed at a non SSP office, the call is routed to an appropriate toll office SSP. An AMA record for access charge billing and possibly customer billing is made at the toll office SSP.

The call code that was used for the Number Services AMA record is indicated by the response message received from the SCP. The AMA call type in the response message contains the AMA call code.

Each billing record contains the dialed number, the number returned from the SCP database, and the calling number.

It is possible to generate billing records for unanswered calls through tables BCCODES and AMAOPTS. Refer to the data schema section of the *North American DMS-100 Translations Guide* for a description of these tables.

1.5.1 Call Prompter

If CCTO_COMB_Bill is ON, the billing record does not contain terminating LNP information associated with the DN that is returned from the 800Plus SCP. The terminating LNP information associated with the CCTO DN, that is returned in the ISUP REL GAP, is contained in the billing record.

1.5.2 OCR

The final 800Plus AMA record contains LNP billing information for the last OCR DN attempt only.

Note: 0- calls and hotel calls that go to a TOPS operator position for entry of the room number do not receive LNP processing.

1.6 Number services code call translation

A toll-free call is recognized as a number service code call during the translations stage.

To recognize a number service code call, table home numbering plan area control (HNPACONT), sub-table HNPACODE contains a tuple with an NSC selector. This is sufficient to indicate that the call is a number service code call and that a query is to be launched.

Note: A 0- call at a TOPS operator position references table HNPACONT to determine if the call is an NSC call before referencing table STDPRTCT.

Also, for a 0- call at a TOPS operator position, NSC processing also requires that the table TOPSPARM parameter NSC_800PLUS_QUERY_AT_POSITION be set to Y.

Once the number service code call has queried the database and received a response, translations are invoked a second time to determine a route for the terminating DN returned from the database.

The call is then routed to the terminating DN and an AMA record is generated.

1.7 Sample toll-free number service calls

The following sections describe the sequence of steps necessary for the typical toll-free number service calls that follow:

1 call from a toll office SSP

2 call with Automatic Call Gapping from an end office

3 call with COB Overflow Call Routing from a toll office with SSP

4 international call from a toll office with SSP

5 end office display call using ISUP

6 Southbound call to a number outside the customer network

7 Northbound call from an end office outside customer network

8 call going to TOPS SSP for entry of the calling number

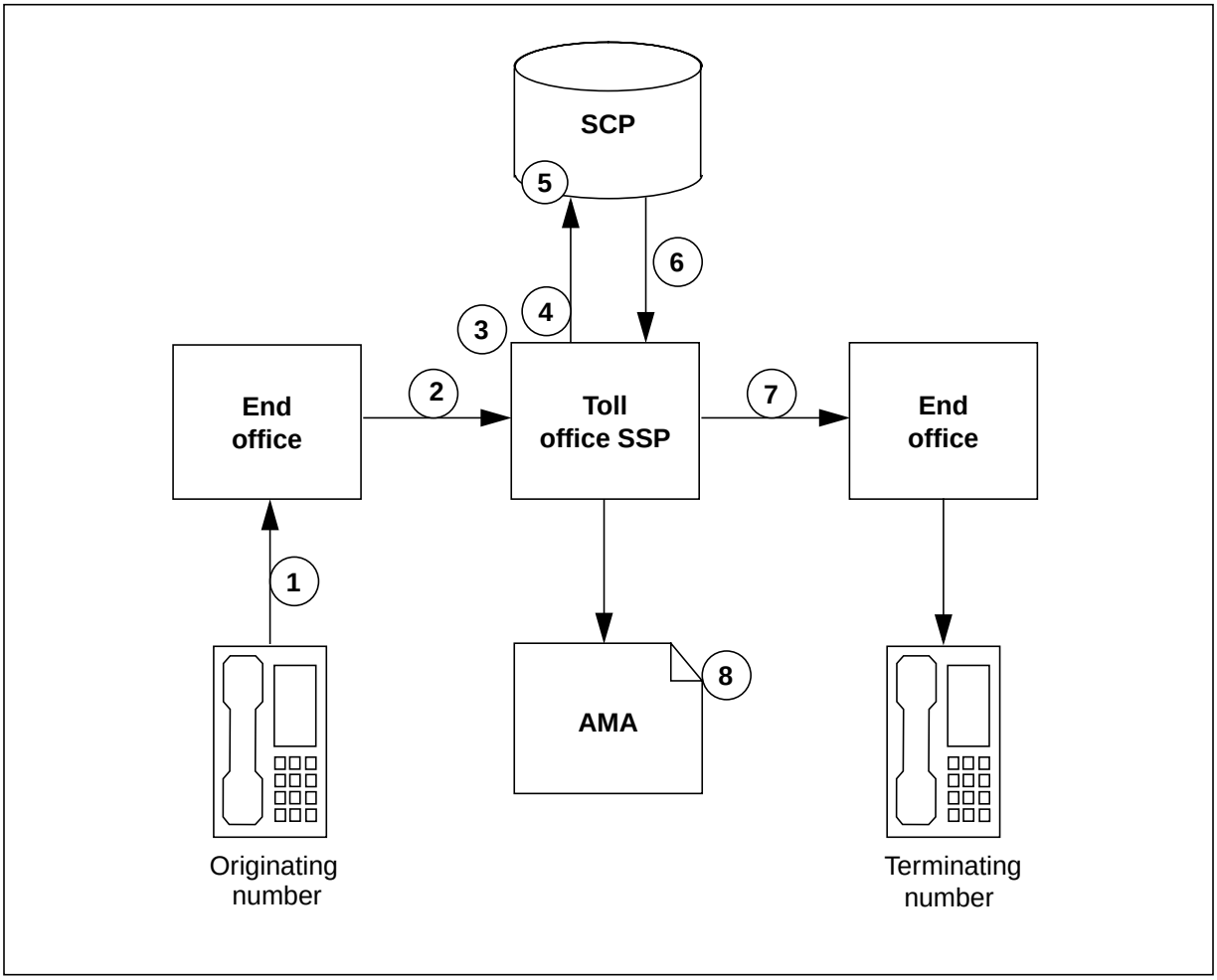
9 0- call to TOPS/SSP with NSC query

10 hotel call going to TOPS SSP for entry of room number without NSC query

1.7.1 Call from a toll office SSP

In this example, a caller dials a toll-free number from a line that is connected to an end office. The call routes to a toll office with SSP capabilities. See Figure 3.

Figure 3 Call from a toll office SSP



The numbers in the figure relate to the call steps that are indicated in the following description.

The common sequence that occurs when this type of toll-free call is made is as follows.

1 The caller dials 1-8XX-NXX-XXXX.

2 From the end office, the call routes to a toll office SSP.

3 Within the SSP, the NSC selector is detected in translations.

4 The automatic call gapping (ACG) control list is checked for an entry that matches the first six, or ten digits of the dialled number. If there is no matching entry on the list, then the query is sent toward the database. If an entry is on the list, and if the GAP interval has expired, then the query is sent toward the database and the GAP interval timer is restarted. If an entry is on the list, and if the GAP interval has not expired, then the query

is blocked and the call is sent to the appropriate treatment. When the GAP duration timer expires for an entry on the list, that entry is automatically removed by the SSP regardless of the state of the GAP interval timer, and subsequent queries are sent to the database.

5 The SSP launches a query with permission TCAP message that contains:

a. a dialed toll-free number (mandatory)

b. a calling number (mandatory)

c. an originating station type (mandatory)

6 The SCP executes routing logic and sends to the SSP a TCAP response message that contains:

a. routing number

b. billing indicators

c. a call code

d. a feature type indicator (FTI) flags

7 Based on the SCP response, the SSP routes the call over a CCS7 or MF trunk, using the:

a. routing number

b. calling number (optional)

c. ANI information digits (or OLI for ISUP) (optional)

8 After the call is answered, billing generates the AMA record with the parameters that follow:

a. call code 142

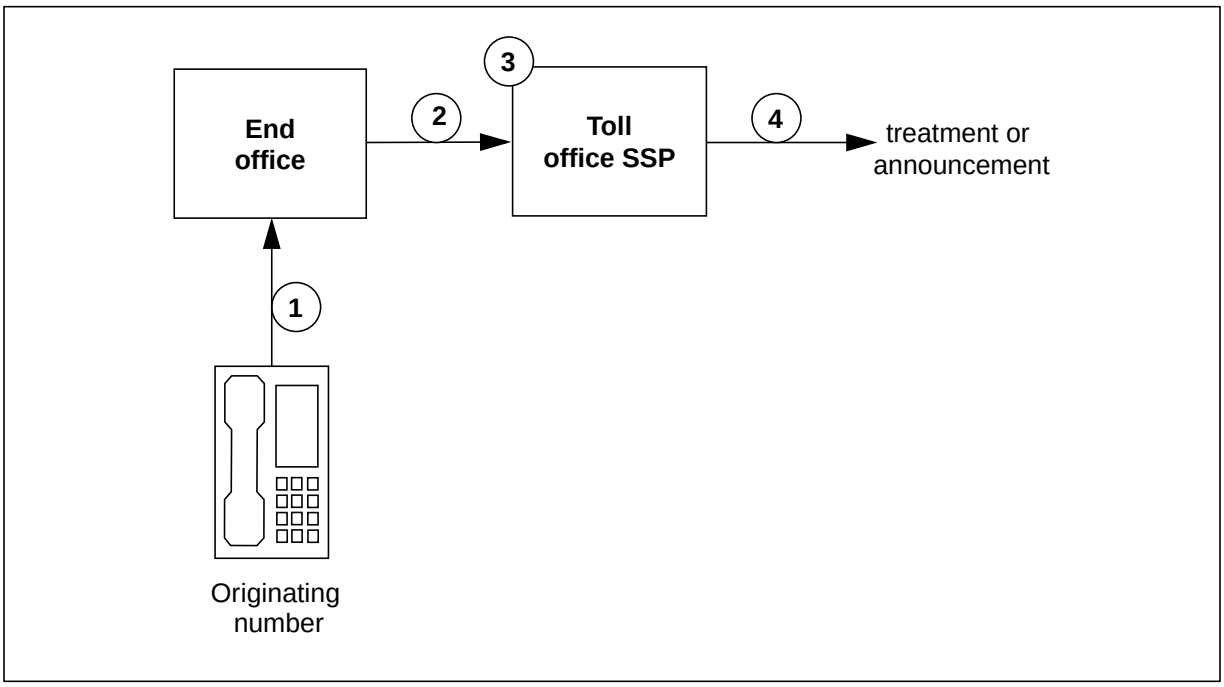
b. structure code 364

c. module code 031 for the feature type indicators

1.7.2 Call with Automatic Call Gapping from an end office

In this example, a caller dials a toll-free number from a line that is connected to an end office. The call routes to a toll office SSP where SCP query and routing are performed. See Figure 4.

Figure 4 Call with automatic call gapping from an end office



This call also contains ACG control information that was included in the response from the SCP. ACG alleviates network congestion with a network traffic management scheme that spreads out calls, in order to allow a busy SCP to keep pace with incoming calls.

Note: The numbers in Figure 4 relate to the call steps that are indicated in the following description.

The following common sequence occurs when a caller makes this type of toll-free call.

1 The caller dials 1-8XX-NXX-XXXX.

2 The call routes to a toll office with SSP capabilities.

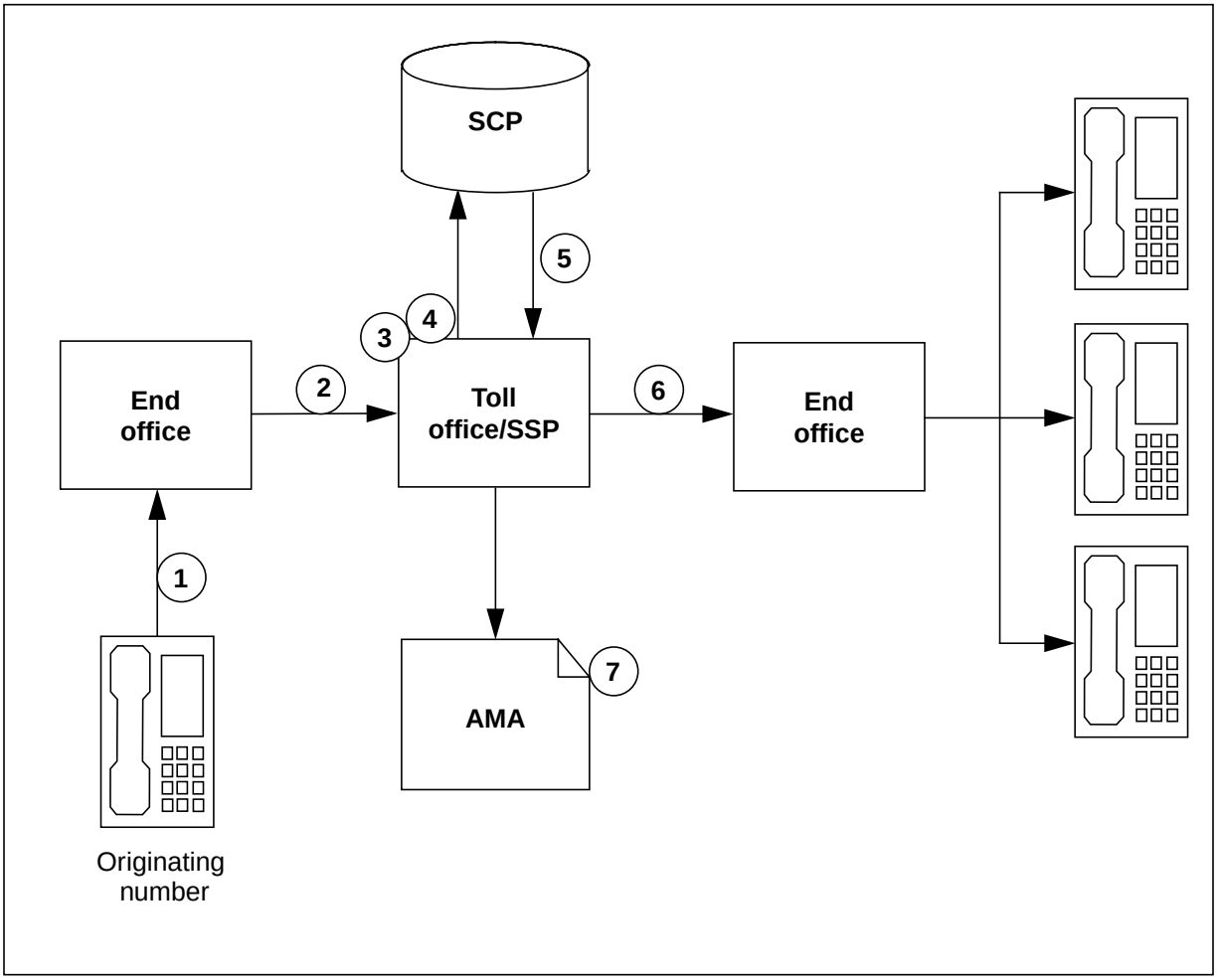
3 Within the SSP, the translations utility detects the NSC selector.

4 The SSP checks the automatic call gapping control list for an entry that matches the first six or ten digits of the dialed number. In this case, the entry is on the ACG control list, and the ACG operational control duration has not expired, neither has the GAP. The call routes to treatment.

1.7.3 Call with COB Overflow Call Routing from a toll office with SSP

In this example, a caller dials a toll-free number from a line that is connected to an toll office with SSP capabilities. See Figure 5.

Figure 5 Call with COB overflow call routing from a toll office/SSP



With COB OCR active for this toll-free number in the SSP, the call is routed to a series of terminating DNs until an idle one is found.

Note: The numbers in the figure relate to the call steps that are indicated in the following description.

The following common sequence occurs when a caller makes this type of toll-free call:

1 The caller dials 1-8XX-NXX-XXXX, and the following information is forwarded to the toll office SSP:

a. dialed digits (toll-free number)

b. calling number

c. ANI information (or OLI if ISUP)

2 The call is routed to the toll office SSP

3 Within the SSP, translations detects the NSC selector.

4 The SSP launches a query with permission TCAP query to the SCP.

5 The SCP sends a TCAP response with a list of up to four terminating numbers for the called 1-8XX-NXX-XXXX number.

6 Successive attempts are made by the SSP to terminate on each DN returned by the SCP, beginning with the first DN on the list. This process continues until

a. the call is answered

b. A busy indication was determined for each DN in the list. The call receives BUSY treatment.

Note: In order for COB OCR to determine a busy indication, CCS7 and ISUP functionality is required from end to end between the SSP and the terminating end office.

7 After the call is answered, toll-free billing generates the AMA record with the following parameters:

a. call code 142

b. structure code 364

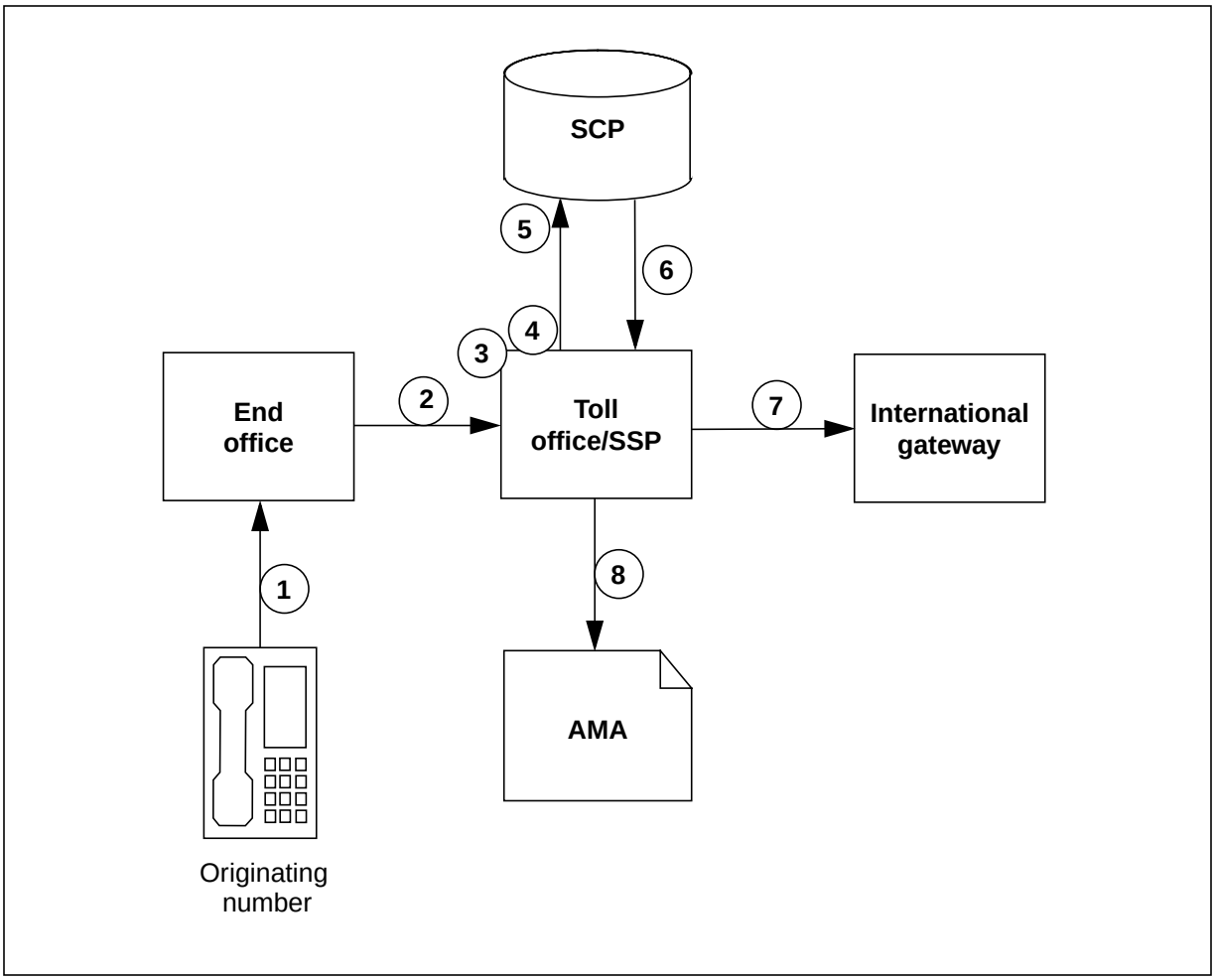
c. module code 031 for the FTI flags

d. module code 121 for OCR

1.7.4 International call from a toll office with SSP

In this example, a caller dials a toll-free number from a line to an end office, from which it routes to a toll office with SSP capabilities. The toll-free number routes to an international gateway switch. See Figure 6.

Figure 6 Call to an international destination



A number of signaling and call processing differences exist between routing to an SSP and an international carrier. The numbers in the figure relate to the call steps that are indicated in the following description.

The following common sequence occurs when a caller makes this type of toll-free call:

1 The caller dials 1-8XX-NXX-XXXX.

2 The end office routes the call to a toll office with SSP capabilities.

3 Within the SSP, translations detects the NSC selector.

4 The automatic call gapping (ACG) control list is checked for an entry that matches the first six, or ten digits of the dialled number. If there is no matching entry on the list, then the query is sent toward the database. If an entry is on the list, and if the GAP interval has expired, then the query is sent toward the database and the GAP interval timer is restarted. If an entry is on the list, and if the GAP interval has not expired, then the query is blocked and the call is sent to the appropriate treatment. When the GAP duration timer expires for an entry on the list, that entry is automatically removed by the SSP regardless of the state of the GAP interval timer, and subsequent queries are sent to the database.

5 The SSP launches a query with permission TCAP message that contains

a. a dialed toll-free number (mandatory)

b. a calling number (mandatory)

c. an originating station type (mandatory)

6 The SCP executes routing logic and sends to the SSP a TCAP response message that contains the

a. routing number (country code and international number)

b. billing indicators

c. carrier (0110)

d. FTI flags for supported features

7 Based on the SCP response, the call routes to the international gateway SSP over a CCS7 trunk with the following information:

a. routing number (which contains the country code)

b. calling number (optional)

c. ANI information digits (or OLI for ISUP)

8 After the call is answered, billing generates the AMA record with the parameters that follow:

a. call code 142

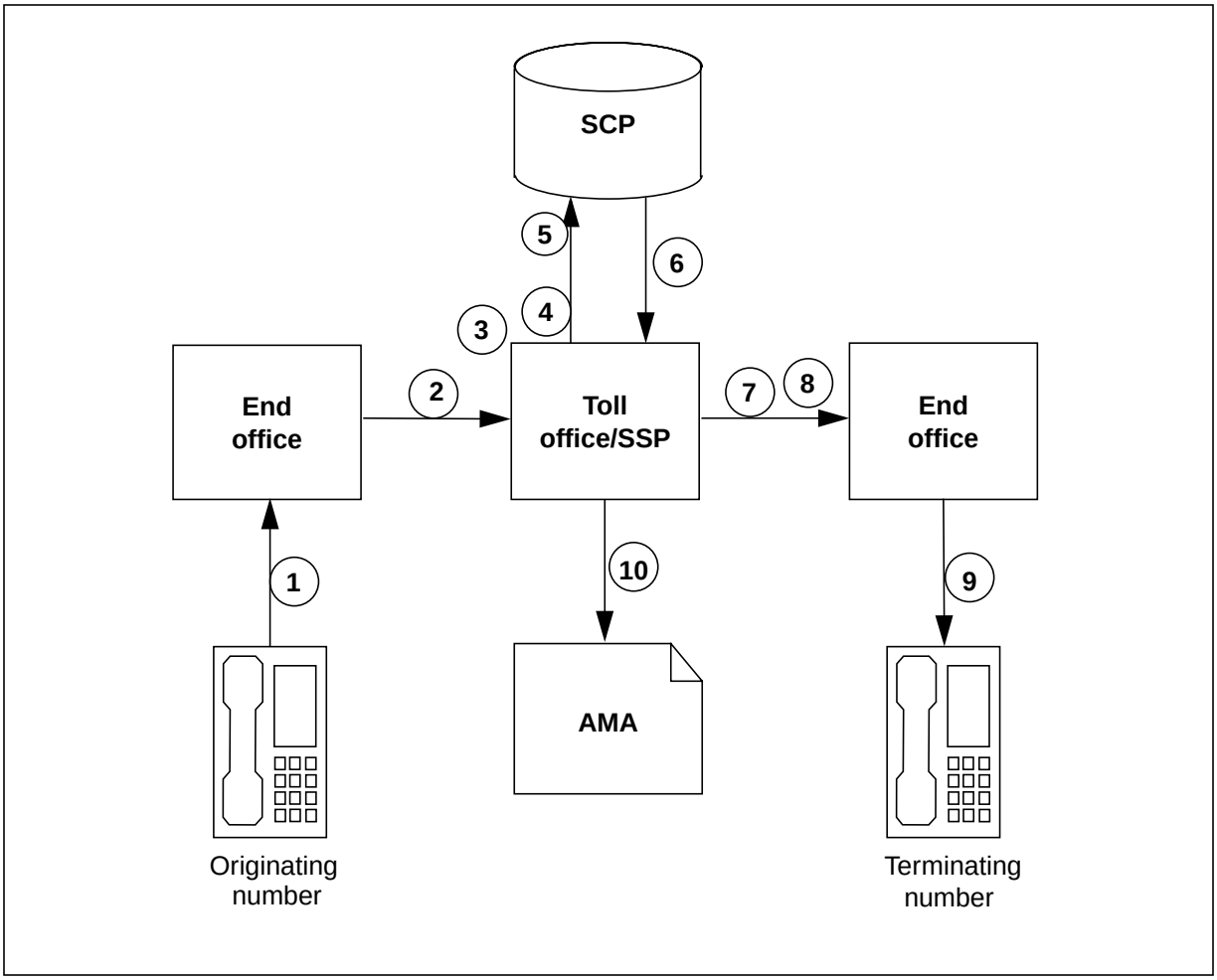
b. structure code 364

c. module code 031 for the feature type indicators

1.7.5 End office display call using ISUP

In this example, a caller dials a toll-free number from a line connected to an end office. From there the call routes to a toll office with SSP capabilities. End office display (EOD) calls require end-to-end ISUP connectivity in order to work. See Figure 7.

Figure 7 Call to EOD subscriber



This 800Plus call proceeds normally, but the FTI flags in the SCP response indicate that the called DN has subscribed to EOD calling number (CID) or dialed number (DNID). This causes an initial address message (IAM) with a generic address parameter (GAP) to send the dialed 800 number (DNID) over an ISUP connection to the subscriber's phone set.

The subscriber at the end office must have line options that allow both the dialed toll-free DN and the calling number to display (minimum 2 lines by 16 characters). For more information on requirements, refer to Chapter 4, "Datafilling end-office display".

Note: The numbers in the figure relate to the call steps in the following description:

The following common sequence occurs when a caller makes this type of toll-free call:

1 The caller dials 1-8XX-NXX-XXXX.

2 The call routes to a toll office with SSP capabilities.

3 Within the SSP, translations detects the NSC selector.

4 The automatic call gapping (ACG) control list is checked for an entry that matches the first six, or ten digits of the dialled number. If there is no matching entry on the list, then the query is sent toward the database. If an entry is on the list, and if the GAP interval has expired, then the query is sent toward the database and the GAP interval timer is restarted. If an entry is on the list, and if the GAP interval has not expired, then the query is blocked and the call is sent to the appropriate treatment. When the GAP duration timer expires for an entry on the list, that entry is automatically removed by the SSP regardless of the state of the GAP interval timer, and subsequent queries are sent to the database.

5 The SSP launches a query with permission TCAP message, that contains

a. dialed toll-free number (mandatory)

b. a calling number (mandatory)

c. an originating station type (mandatory)

6 The SCP executes routing logic and sends the SSP a TCAP response message that contains the

a. routing number

b. billing indicators

c. feature type indicator flags that identify the 800Plus EOD subscribed options for each DN, including calling number (CID) and dialed number (DNID) options

7 Based on the SCP response, the call routes to the terminating end office with EOD capability over ISUP with

a. a routing number

b. a calling number (optional)

c. ANI information digits (or OLI for ISUP) (optional)

8 For EOD, the SSP also sends an initial address message (IAM) with a generic address parameter (GAP) that contains the display and related information

a. calling party address and privacy

b. calling party address (CID, if subscribed at the SCP)

c. 800Plus service indicator

d. called party DN (DNID, if subscribed at the SCP)

Note: EOD calls must be over ISUP trunks from the originating end office through the SSP to the terminating end office.

9 The ACD, Centrex, or CMS terminals that are subscribed display the information that is sent, informing the call recipient that

a. this is an 800Plus call

b. which number was called

c. the caller's number along with a name

These displays require NTS_DNID and NTS_CID subscriptions at the end office and the SCP that service the call.

10 After the call is answered, billing generates the AMA record with the parameters that follow:

a. call code 142

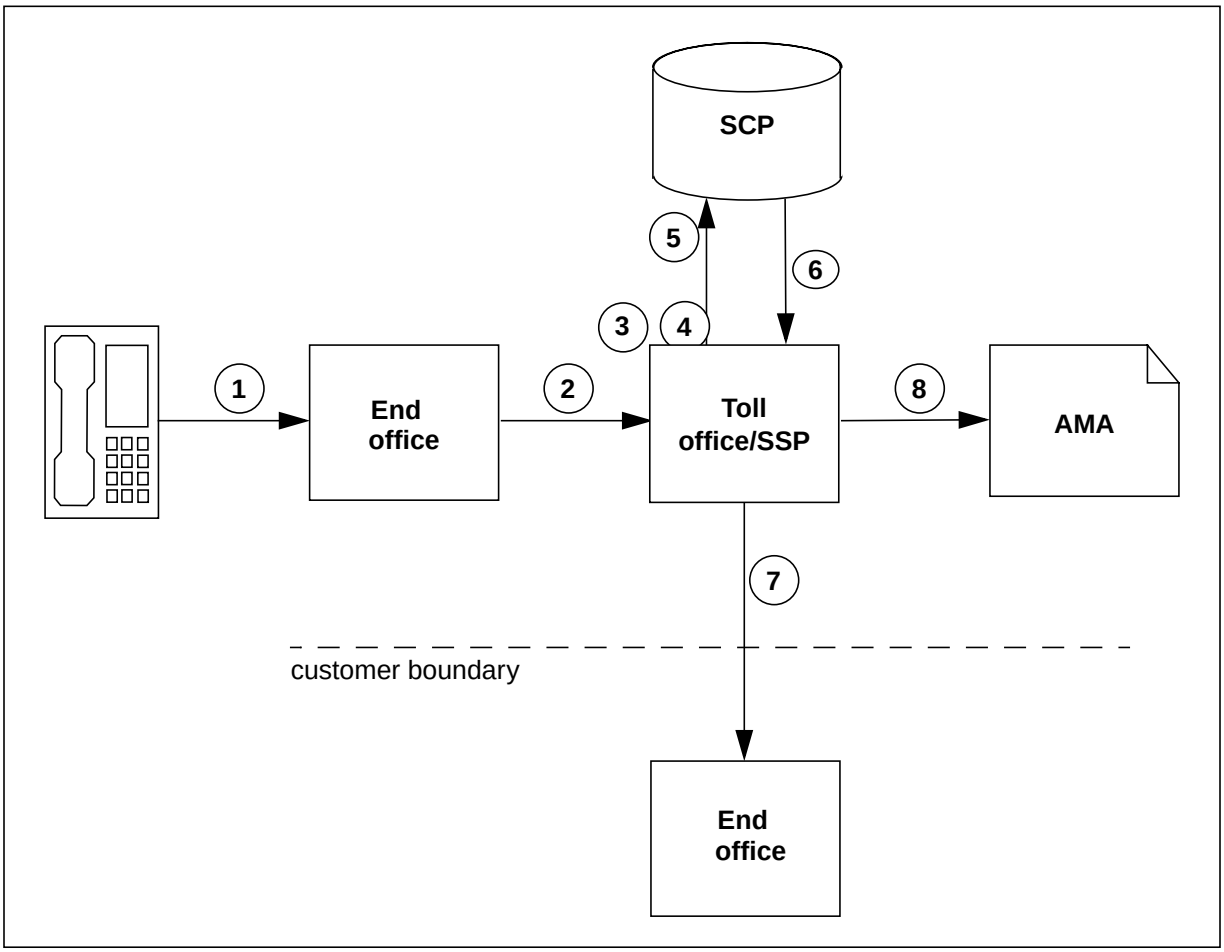
b. structure code 364

c. module code 031 for feature type indicators

1.7.6 Southbound call to a number outside the customer network

In this example, a caller dials a toll-free number from a line connected to an end office without SSP capabilities. The toll-free number routes to a toll office SSP, where the SSP performs the query and routing. See Figure 8.

Figure 8 Southbound call to a number outside the customer network



If the call supplies a toll-free number based in the United States, the Southbound functionality of 800Plus activates in order to route the call. For U.S calls, the Southbound feature converts the calling party number (CPN) information to the charge number (CHG) parameter, and converts it back upon returning to Canada.

Originally, this functionality was developed for calls to the U.S., but it is also used within Canada. Essentially, Southbound means North American calls beyond the customer network boundaries, not just the U.S. border. The numbers in the figure relate to the call steps that are indicated in the following description:

The following common sequence occurs when a caller makes this type of toll-free call:

1 The caller dials 1-8XX-NXX-XXXX.

2 The end office signals a toll office SSP.

3 Within the SSP, translations detects the NSC selector.

4 The SSP checks the automatic call gapping (ACG) control list for an entry that matches the first six or ten digits of the dialed number.

5 The SSP launches a query with permission TCAP message, that contains

a. dialed toll-free number (mandatory)

b. a calling number (mandatory)

c. an originating station type (mandatory)

6 The SCP executes routing logic and sends to the SSP a TCAP response message that contains the following:

a. routing number, including the calling line identification (CLID) for both unique and non-unique signaling number originations

b. billing indicators

c. carrier (0288 for ATT)

d. Feature type indicator flags with special routing codes, including a U.S. carrier code

Note: The carrier is matched to CARRIER code in table NSCCARR. If no match is made, the call is sent to treatment.

7 Using ISUP trunks, the SSP forwards an initial address message (IAM) to the terminating end office. The IAM contains the

a. called number = routing number from SCP

b. CHG parameter = originating DN (NPA NXX, ANI or NPA)

c. originating line ID (OLI = 01)

d. carrier ID from SCP (288 for ATT)

8 After the call is answered, billing generates the AMA record with the parameters that follow:

a. call code 142

b. structure code 364

c. module code 031 for feature type indicators

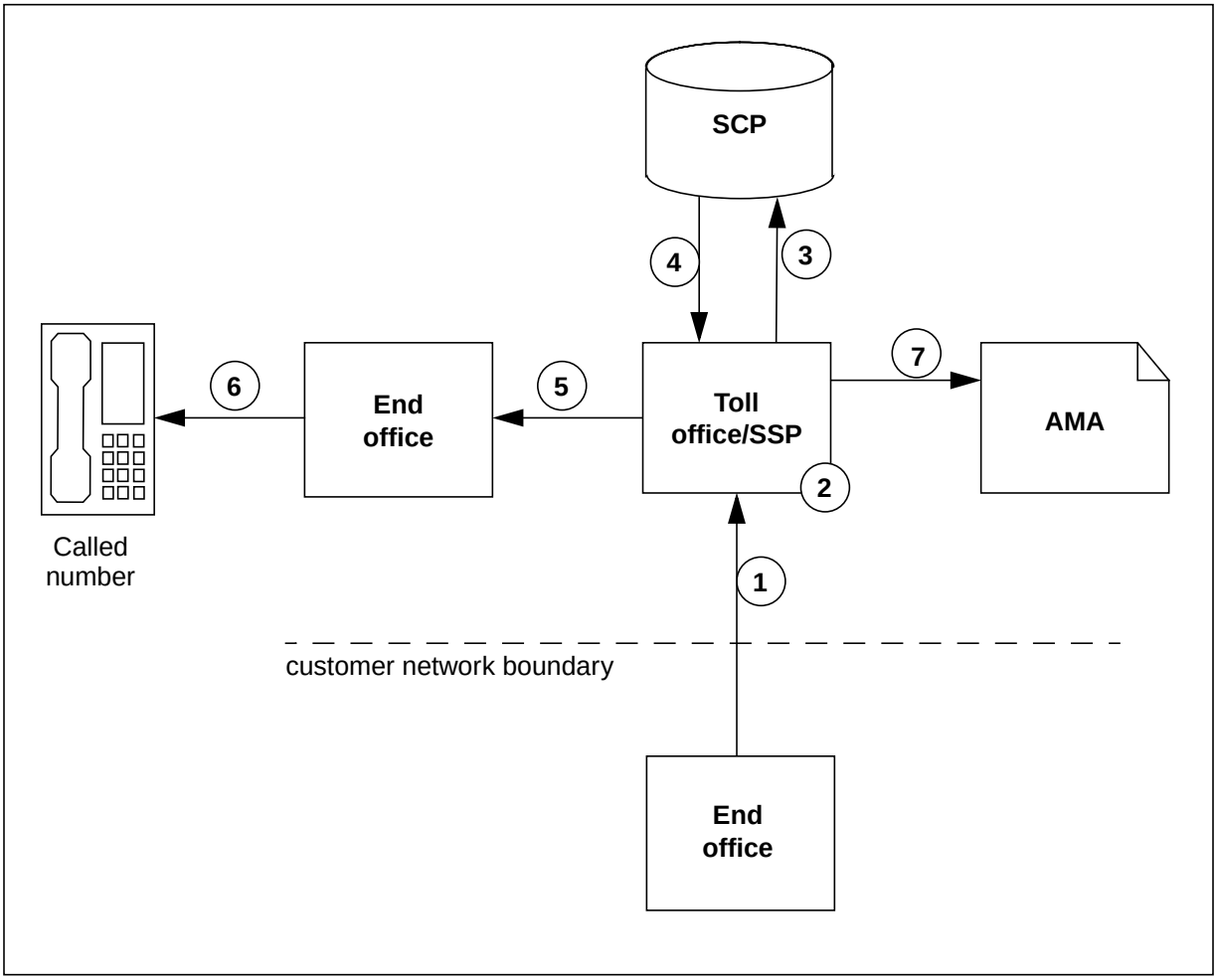
d. module code 021 for the carrier code

Note: .Southbound calls do not impact the billing functionality.

1.7.7 Northbound call from an end office outside the customer network

In this example, a caller dials a toll-free number from a line connected to an end office that is outside the customer network. The call can be either from the U.S., or from another common carrier in Canada. The primary functions of the Northbound functionality are to identify the incoming carrier, and to convert the CHG parameter to the CPN parameter if the call is from the U.S. See Figure 9.

Figure 9 Northbound call from outside the customer



Note: The numbers in the figure relate to the call steps in the following description.

The following common sequence occurs when a caller makes this type of toll-free call:

1 A caller outside the customer network dials 1-8XX-NXX-XXXX.

2 The customer SSP converts the IAM to fit with 800Plus routing, including

a. called number = terminating 10-digit toll-free DN

b. CHG number = CPN parameter

c. OLI = ANI carrier information digits

Note: Table TRKGRP, value CHGNUM activates the Northbound functionality. Table SSPTKINF, field CARRIER must be locally datafilled

with the carrier code in order to appear in AMA module code 021 for billing.

3 The SSP launches a query with permission TCAP message that containsa

a. dialed toll-free number (mandatory)

b. a calling number (mandatory)

c. an originating station type (mandatory)

4 The SCP executes routing logic and sends the SSP a TCAP message that contains the

a. routing number

b. billing indicators

c. call code

d. carrier (0110)

5 Based on the SCP response, the SSP routes the call over CCS7, MF trunk, or a line to the terminating DN, using the

a. routing number

b. calling number (optional)

c. ANI information digits (or OLI for ISUP) (optional)

6 The end office terminates the call to the dialed toll-free DN.

7 After the call is answered, billing generates the AMA record with the parameters that follow:

a. call code 141

b. structure code 364

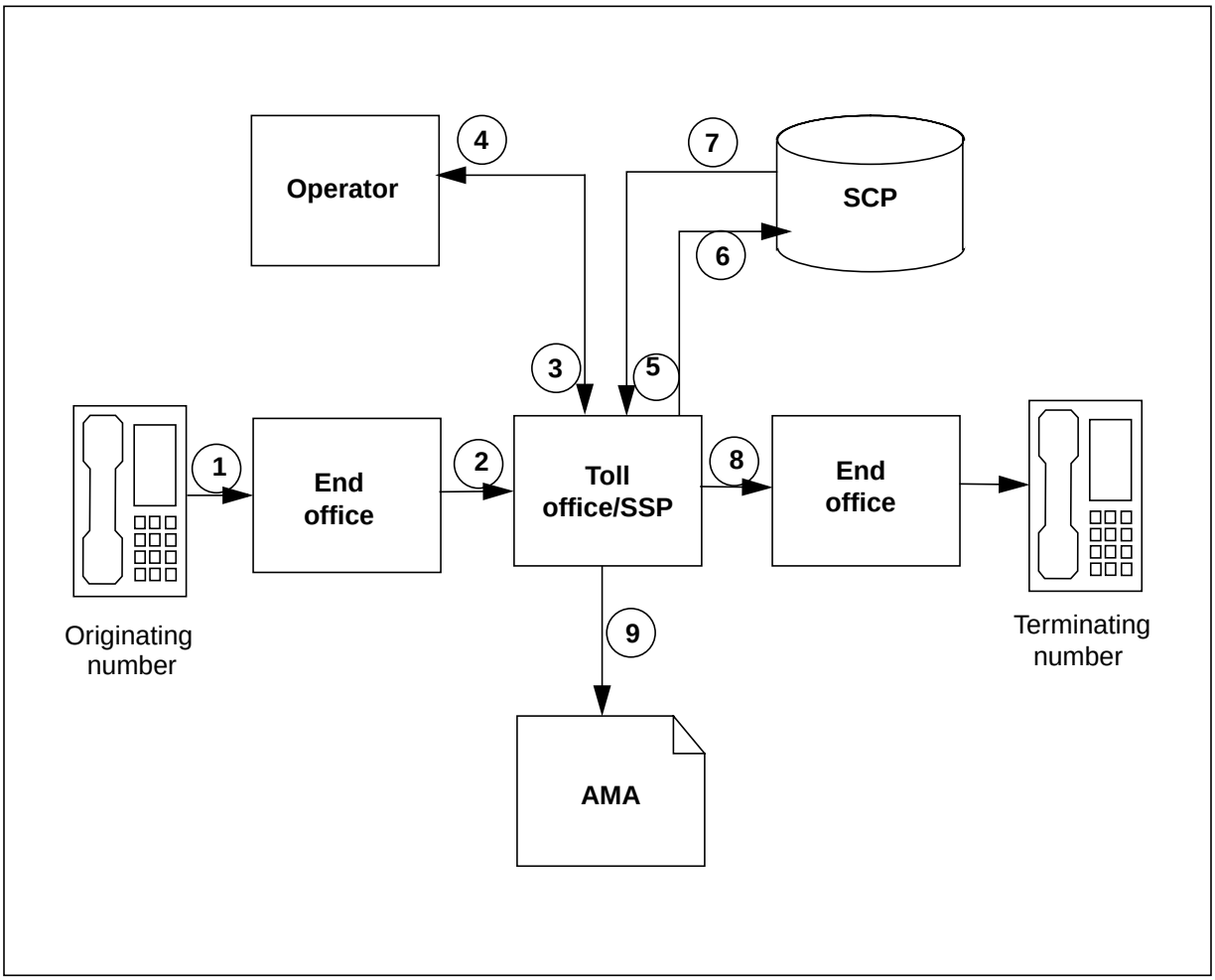
c. module code 031 for the feature type indicators

d. module 021 for the carrier code.

1.7.8 Call going to TOPS SSP for entry of calling number

In this example, a caller dials a toll-free number from a line that does not supply ANI. The call routes to a TOPS SSP, where the calling number can be captured and and SCP query can be launched.

Figure 10 Call that uses TOPS position



Note: This call goes to the operator only for entry of the calling number and does not receive full operator processing. It is treated like a non-operator call once the calling number is entered. It does not produce TOPS AMA indicating operator handling of the call.

1 The caller dials 1-8XX-NXX-XXXX from a line that does not supply ANI.

2 The call is routed to a TOPS SSP.

3 Within the TOPS SSP, translations detect the NSC selector in HNPACONT and the missing calling number.

4 The call is routed to an operator position for entry of the calling number. Once the operator enters the calling number, the operator is released form the call.

5 The automatic call gapping (ACG) control list is checked for an entry that matches the first six, or ten digits of the dialled number. If there is no matching entry on the list, then the query is sent toward the database. If an entry is on the list, and if the GAP interval has expired, then the query is sent toward the database and the GAP interval timer is restarted. If an entry is on the list, and if the GAP interval has not expired, then the query is blocked and the call is sent to the appropriate treatment. When the GAP duration timer expires for an entry on the list, that entry is automatically removed by the SSP regardless of the state of the GAP interval timer, and subsequent queries are sent to the database.

6 The TOPS SSP launches a query with permission TCAP message that contains the

a. dialed toll-free number (mandatory)

b. calling number (mandatory)

c. originating station type (mandatory)

7 The SCP executes routing logic and sends the TOPS SSP a TCAP response message that contains the

a. routing number

b. billing indicators

c. FTI flags for supported features

8 Based on the SCP response, the call routes over CCS7 or MF trunks to the terminating end office, based on the following information:

a. routing number

b. calling number (optional)

c. ANI information digits or OLI for ISUP (optional)

Note: The pretranlsator OPER is used in table STDPRTCT to route on the DN returned from the database.

9 After the call is answered, billing generates the AMA record with the following parameters:

a. call code 142

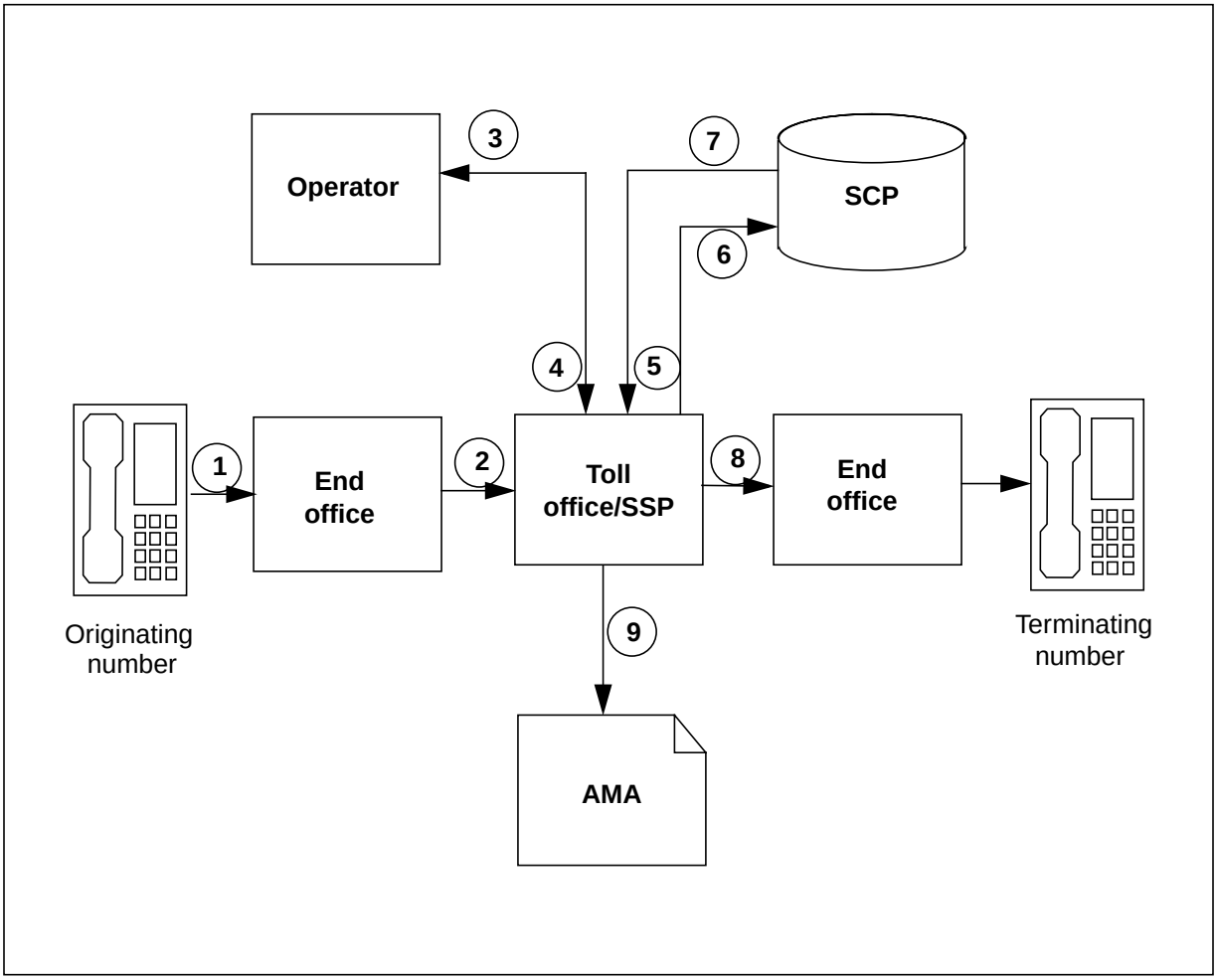
b. structure code 364

c. module code 031 for the feature type indicators

1.7.9 0- call to TOPS SSP with NSC query

In this example, a caller dials 0. The call routes to a TOPS SSP, where the operator enters a toll-free number and an SCP query is launched.

Figure 11 Call that uses TOPS position



Note: The numbers in the figure relate to the call steps that are indicated in the description that follows.

1 The caller dials 0.

2 The call is routed to a TOPS SSP and arrives at an operator position.

3 The operator enters 8XX-NXX-XXX.

4 Within the TOPS SSP, translations detects the NSC selector in HNPACONT, and TOPSPARM parameter NSC_800PLUS_QUERY_AT_POSITION is Y.

Note: When the NSC selector is not found in HNPACONT (regardless of TOPSPARM parameter NSC_800PLUS_QUERY_AT_POSITION), the toll-free number is not identified as requiring NSC processing, and standard DMS translations are performed.

5 The TOPS SSP checks the ACG list for an entry the matches the first six or ten digits of the dialed number.

6 The TOPS SSP launches a query with permission TCAP message that contains the

a. dialed toll-free number (mandatory)

b. calling number (mandatory)

c. originating station type (mandatory)

7 The SCP executes routing logic and sends the TOPS SSP a TCAP response message that contains the

a. routing number

b. billing indicators

c. FTI flags for supported features

8 Based on the SCP response, the call routes over CCS7 or MF trunks to the terminating end office, based on the following information:

a. routing number

b. calling number (optional)

c. ANI information digits or OLI for ISUP (optional)

9 After the call is answered, billing generates the AMA record with the following parameters:

a. call code 192

b. structure code 752

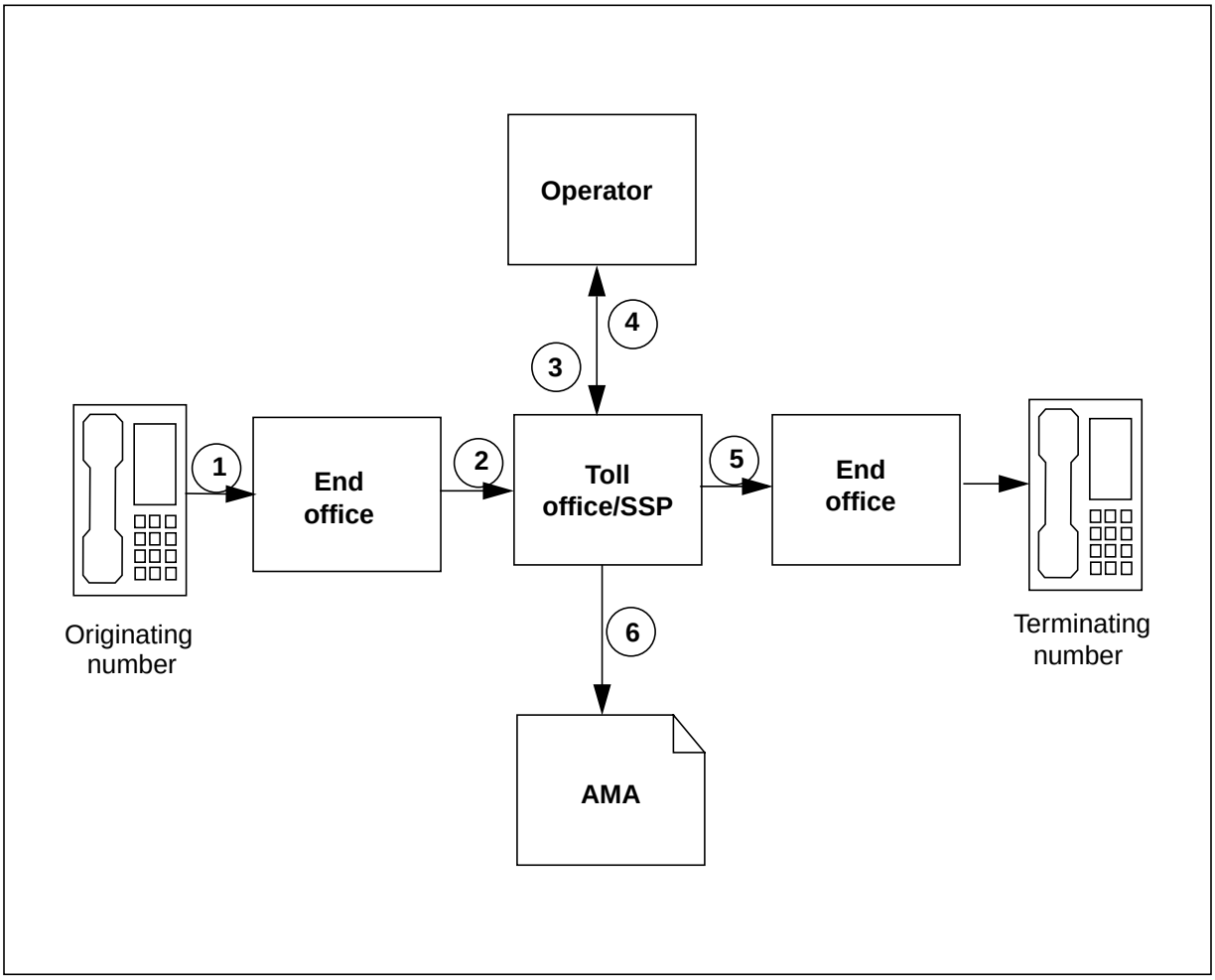
c. module code 031 for the feature type indicators

1.7.10 Hotel call going to TOPS SSP for entry of room number without NSC query

In this example, a caller dials a toll-free number from a hotel phone that requires that a room number be recorded. The call routes to a TOPS SSP, where the room number can be captured. In this example, TOPSPARM parameter NSC_800PLUS_QUERY_AT_POSITION is N, so no NSC processing is done.

Note: When this call arrives at the operator position, it is treated like an operator handled call and produces standard TOPS AMA indicating operator handling of the call.

Figure 12 Call that uses TOPS position



Note: The numbers in the figure relate to the call steps that are indicated in the description that follows

1. The caller dials 8XX-NXX-XXXX from a hotel that requires entry of the room number.
2. The call is routed to a TOPS SSP.
3. Within the TOPS SSP, translations detects the need for a room number.
4. The call is routed to an operator position for entry of the room number.
5. TOPS SSP detects that the TOPSPARM parameter NSC_800PLUS_QUERY_AT_POSITION is N. The call routes using the toll-free number. The call signals the toll-free number and the calling number so that the NSC processing can procede in the next office.

   Note: The call must route out of STDPRTCT if the NSC selector is datafilled in table HNPACONT for the toll-free number.
6. After the call is answered, billing generates the AMA record with the following parameters:

   a. call code 192

   b. structure code 752

1.8 800Plus agent interworking

Table 1 shows the interworking between originating and terminating agents. An X indicates interworking is supported. Numbers indicate the number of associated notes.

Table 1 800Plus agent interworking matrix

Originating agents	Terminating agents								
	ISUP IT trunks	ISUP IBN trunks	MF IT trunks	PRI trunks	DMS 100/200 lines	ISDN lines	ACD/ UCD	Hunt group	Attendant console
ISUP IT trunks	X	X	1	X	X	X	X	X	X
MF IT trunks See Note 1	X	X	1	X	X	X	X	X	X
Super CAMA trunks	X	X	1	X	X	X	X	X	X
TOPS trunks	4		1, 4						
PX trunks (CFW) See Note 2	2	2	1, 2	2	2	2	2	2	2
PRI trunks	X	X	1	X	X	X	X	X	X
Coin lines	X	X	1	X	X	X	X	X	X

Table 1 800Plus agent interworking matrix (continued)

Originating agents	Terminating agents								
	ISUP IT trunks	**ISUP IBN trunks**	**MF IT trunks**	**PRI trunks**	**DMS 100/200 lines**	**ISDN lines**	**ACD/ UCD**	**Hunt group**	**Attendant console**
DMS 100/200 lines	X	X	1	X	X	X	X	X	X
ISDN lines	X	X	1	X	X	X	X	X	X
RCF 800/CFW 800	X	X	1	X	X	X	X	X	X
Attendant consoles	X	X	1	X	X	X	X	X	X
TOPS position	3, 4		1, 3, 4						

Note 1: MF IT Trunks may be used for 800Plus call completion; however, some 800 services and features are not offered, such as, COB OCR, CID, and DNID.

Note 2: PX trunks cannot call 800Plus numbers directly. Calls to specific 800 numbers may be made by calling a line that is forwarded to the 800 number.

Note 3: CONA OCR is not supported for calls at a TOPS operator position.

Note 4: TOPS does not support CID and DNID.

1.9 800Plus Feature interactions

The following features have special interworking considerations with toll-free number service when they are both on the same SSP:

- call forwarding
- DISA
- remote call forwarding
- three-way calling
- virtual facility group (POTS)
- attendant console
- automatic call distribution and hunt club overflows
- AIN interactions
- LNP interactions
- PRI interworking
- agent support

1.9.1 Call forwarding

Toll-free number service interworks with all types of call forwarding offered with the DMS-100 switch. Toll-free number service supports both toll-free to call forwarding and call forwarding to toll-free interworking.

The most common interworkings are in the following situations:

- Terminal A dials a POTS number that is call forwarded to a toll-free number
- Terminal A dials a toll-free number that is call forwarded to a POTS line
- Terminal A dials a toll-free number that is call forwarded to another toll-free number

1.9.1.1 POTS number is call forwarded to a toll-free number

Called digits are translated at the originating switch for the call and a billing record can be generated. When the call reaches terminal B (the POTS number), the call is forwarded to a toll-free number. After the toll-free number call is translated and a routing number is obtained from the SCP, the call is routed to the called terminal (terminal C). Terminal A is charged for the call between itself and terminal B. Terminal C is charged for the toll-free leg of the call with terminal B as the originator.

1.9.1.2 Toll-free number is call forwarded to another toll-free number

Toll-free digits are translated at the SSP that is associated with the originating terminal A and a billing record is generated for the call. When the call arrives at terminal B, the call is forwarded to a second toll-free number, a second database query is carried out and the call is forwarded to the new terminal C. A second billing record is generated. Terminal B is charged for the first leg of the call (with terminal A as the originator) and terminal C is charged for the second leg of the call (with terminal B as the originator).

1.9.1.3 Toll-free number is call forwarded to a POTS line

Toll-free digits are translated at the SSP that is associated with originating terminal A and a billing record is generated for the call. When the call arrives at terminal B, it is forwarded to a regular POTS line. The forwarded call is retranslated and is routed to terminal C. A second billing record can be generated depending on billing datafill. The toll-free subscriber (terminal B) is charged for the toll-free leg of the call and also for the call forwarded part of the call, from B to C.

1.9.1.4 Remote call forwarding

In remote call forwarding, the subscriber dials a directory number that is not connected to a terminal, and the call is forwarded to a second directory number. Remote call forwarding enables the subscriber to have callers place calls, but the caller is only charged for the first leg of the call.

Generally, remote call forwarding is set up so that the client phones a number in the local area code, and therefore does not pay for the call.

With remote call forwarding, a local call is forwarded to a toll-free number for a database query. Therefore, the terminating DN is varied based on the SCP services available, for instance, time-of-day routing.

Similarly, the client could dial a toll-free number that is remote call forwarded to a regular POTS number or to another toll-free number.

1.9.2 DISA

800P does not work with DISA.

A user can dial in DISA and perform an 800 call. At the initial stage of the call, translations for the 800 number uses the network class of service (NCOS) of the customer group of the DISA DN. Translations then uses the characteristics of the trunk that originated the call to translate the 800 number.

Since DISA resets the NCOS to the pretranslator of the originator (trunk pretranslator), DISA is not a redirectional feature. Therefore, any feature invoked after DISA should support the originator.

1.9.3 Three-way calling

When a toll-free call is initiated, the originator of the call is blocked from starting a three-way call until the database response is received.

1.9.4 Virtual facility group (POTS)

Virtual facility groups (VFG) are used to change the appearance of an agent by putting the call through a facility that effectively changes the characteristics of a call. When the calling party makes a toll-free call on a terminal through a VFG, the line attributes used by translations are those of the VFG, not those of the actual terminal.

For toll-free service to work in a VFG, the originating terminal must be one of the allowable line class codes used by VFG. Only POTS VFG can originate an 800P call.

Note: TOPS SSP does not support calls to or from a VFG.

1.9.5 Attendant console

For normal calls, the attendant console dials the call for a caller and as soon as dialing is complete, the call is handed off. For a toll-free call, the attendant console cannot be released until the database query is complete and the call has been routed to the called party.

For an attendant console that is both the destination for toll-free number service and has been placed into night service, the toll-free subscriber

(attendant console) is charged for both the first and second legs of the toll-free call, if applicable. Two billing records are generated for the first and second legs of the call.

AC in the Night Service to 800Plus functionality requires Virtual Facility Group (VFG) to add the DN to the billing record.

For OCR from Attendant Console in Night Service to 800Plus functionality overflow is handled according to the night service destination, instead of the Attendant Console interaction.

1.9.6 Automatic call distribution and hunt group overflows

For automatic call distribution (ACD) and hunt groups that are the destination for toll-free number service and experience overflows, the toll-free subscriber (that is, the ACD or hunt group) is charged for the first leg of the toll-free call. A second billing record is generated for the second leg of the call. The terminal at the overflow destination is charged for the second leg of the call.

1.9.7 AIN interactions

800Plus can only route to AIN trigger TAT if

- the call is on the last route on the OCR route set
- the call is a normal 800Plus call without OCR.

AIN responses cannot route to 800Plus number if it is on the same SSP.

Note 1: 800Plus interworks with LNP functionality. 800Plus does not support other AIN interactions.

Note 2: TOPS SSP does not support AIN.

For more information on behavior and limitations, refer to the *Advanced Intelligent Network Essentials Service Implementation Guide*, 297-5161-021.

1.9.8 LNP interactions

An 800Plus response can route a call to a ported number. For more information, refer to the *Local Routing Number - Local Number Portability Service Implementation Guide*, 297-8981-021.

Note: Call Prompter can introduce excessive holding times with AIN HDBs. For engineering guidelines on AIN HDBs, refer to the *Local Routing Number - Local Number Portability Service Implementation Guide*, 297-8981-021.

Note: A 0- call, or a hotel call that goes to a TOPS operator position for entry of the room number does not receive LNP processing while at the operator position.

1.9.9 PRI Interworking

Calls originating on PRI trunks that use any of the NTNAPRI protocol variants, as specified in table LTDEF, can interwork directly with 800 services. U449PRI (used when connecting ATT 4ESS) and U459PRI (used when connecting ATT 5ESS) are not supported.

800Plus does not support PRI-originated 800Plus calls-to-Call prompter functionality.

1.9.10 Agent support

Functionality support does not extend agent support.

Chapter 2: Engineering toll-free number service

This chapter provides information on how to engineer a service switching point (SSP) for toll-free number services. The subsequent sections of this chapter present the following:

- "Software requirements," on page 55 provides information on the software that is required to operate toll-free number service.
- "Engineering requirements," on page 56 provides information on the office parameters and data schema required to operate toll-free number services.

2.1 Software requirements

The toll-free number service functional groups are installed on every SSP that serves as a source or destination for toll-free calls.

2.1.1 Toll office service switching points

Table 2 lists the 800Plus software that is required for a toll office SSP.

Table 2 SSP software

Product number	Title
NTS00006	800PLUS — Canada Only
NTS00011	Release Link Trunk (RLT) with no third-party interaction
NTS00016	800 Expansion—888 Code (for SSP)
NTS00017	800 Expansion—877 Code (for SSP)
NTS00018	800 Expansion—866 Code (for SSP)
NTS00019	800 Expansion—855 Code (for SSP)
NTS00020	800 Expansion—844 Code (for SSP)
NTS00021	800 Expansion—833 Code (for SSP)
NTS00002	800PLUS End Office Display (EOD)

Table 2 SSP software (continued)

Product number	Title
NTS0007	EOD per DN subscription controls
NTS0008	EOD Call Management Services (CMS) restructure

2.1.2 End office switches

Table 3 lists the 800Plus software that is required for an end office switch.

Table 3 End office switch software

Product number	Title
NTS00006	800PLUS — Canada Only
NTS00023	800 Expansion—888 Code (for end office)
NTS00002	800PLUS End Office Display (EOD)
NTS00007	EOD per DN subscription controls
NTS00008	EOD Call Management Services (CMS) restructure

2.2 Engineering requirements

This section provides information on the office parameters and data schema tables that are required to operate toll-free number services.

2.2.1 BC recording units

The BC recording units are the primary recording units for billing all call processing and frame relay calls. If recording units are not provisioned, then calls cannot be billed.

To provision BC recording units, use the following formula:

```
CRS_PRU_POOL2_SIZE =
existing provisioned number + NUM_OF_NSC_EXT_BLK
```

CRS_PRU_POOL2_SIZE is an office parameter in table OFCENG. Refer to the *Office Parameters Reference Manual* for more information.

2.2.2 Northam_Tollfree_Variant office parameter

This office parameter combines E800 for the U.S. market and 800P for the Canadian market in the same Product Computing Module Load (PCL) in NA006 and subsequent releases.

This parameter is set in one of two situations:

1 On a newly commissioned office, Nortel personnel set this parameter to either CANADIAN_SERVICE or US_SERVICE, before release to the customer.

Set the value of this parameter to CANADIAN_SERVICE for all loads destined to Canadian offices. Set the value of this parameter to US_SERVICE for all loads destined to U.S. offices.

2 In loads used to upgrade existing offices, set the value to NIL_SERVICE. A one-night process (ONP) from an NA004 or NA005 load results in NORTHAM_TOLLFREE_VARIANT being automatically set to the correct value. ONPs from offices above NA005 will transfer the value of NORTHAM_TOLLFREE_VARIANT from the active side.

The value of this parameter can be changed only once. Further changes using table editor commands are disabled. This change can occur between NIL_SERVICE and CANADIAN_SERVICE or between NIL_SERVICE and US_SERVICE, but not between the two variants. The default value for this parameter is NIL_SERVICE.

Possible loss of service

Any attempt by the operating company to change this parameter may result in loss of service. Only Nortel can change this parameter during manufacturing.

NORTHAM_TOLLFREE_VARIANT is an office parameter in table OFCOPT. Refer to the *Office Parameters Reference Manual*.

2.2.3 Number of NSC extension blocks

To determine the number of NSC extension blocks that are required, use the following formula:

```
NUM_OF_NSC_EXT_BLK =
(number of toll-free/SSP calls per second)  x
(mean toll-free/SSP call holding time)
```

NUM_OF_NSC_EXT_BLK is an office parameter in table OFCENG. Refer to the *Office Parameters Reference Manual*.

If insufficient blocks are provided, all calls that do not get through are routed to “No software resources” treatment.

2.2.4 Number of transaction identifiers

The Toll-free service software uses the IDPL (identifier pools) interface for TRID (transaction identifier) management.

In IDPL, the Toll-free service application specifies a group size parameter. The TRID class manager initially allocates one group of TRIDs. If 70% of the initial group of TRIDs is used up, the TRID class manager allocates another group until the maximum number of TRIDs allowable is reached. For the Toll-free service application, the group size parameter is set to 32 TRIDs.

Chapter 3: Datafilling toll-free number service

This chapter describes the datafill needed to support toll-free number service. Read this entire section carefully before proceeding with datafill. For other information on translations, refer to the *North American DMS-100 Translations Guide*.

- "Understanding translations," on page 59 provides a brief description of the translations process.
- "Translations tables for NTS00006," on page 62 explains the order in which toll-free number service data tables should be datafilled.
- "Datafilling office parameters," on page 66 provides a procedure for datafilling 800Plus toll-free number service on an SSP. It also provides a procedure for datafilling the appropriate tables to access 800Plus toll-free number service on an SSP through the 8XX toll-free number service codes, including dealing with ambiguous codes.
- "Billing Suppression for 8XX Calls," on page 91 provides a procedure for suppressing double-billing that can occur in certain site configurations.

Example TRAVER outputs are available in Appendix A, "Example TRAVER outputs". These examples correspond to the call scenarios described in Chapter 1, "Understanding toll-free number service".

3.1 Understanding translations

Translations is the process in which information that is stored in data tables is accessed by the DMS switch, and processed to support toll-free number service. You must datafill certain tables in a specific sequence to ensure full and efficient operation of the service.

3.1.1 Components of the translations system

The translations system consists of data, and the facilities for accessing and manipulating that data. The translations system includes the following elements:

- the translations database
- the hardware on which the database resides
- the table editor (that is, the software that controls data entry, storage, and retrieval)

Entries, deletions, and modifications to the translations database are made to these tables through the table editor or a dump-and-restore process.

3.1.2 Translations database

To perform translations, the switch must access the translations database that is stored in the central control memory.

The translations database contains data tables. Each table has a specific purpose and contains a certain type of data. Every table has a name (table names are in upper-case). A table consists of horizontal rows and vertical columns of data. Each row contains one record of data, and is called a tuple. Each column is called a field.

Refer to the *North American DMS-100 Translations Guide*.

3.1.3 How the translations system reads tables

Each table that is used by the translations system has a specific function. Translations typically access a combination of tables to obtain all the information needed to translate and route a call.

Certain key fields in each table index the next table or set of tables. Any fields in the table can be used to key other tables.

Toll-free number service translations involves reading specific tuples in designated data tables to determine the path that a call takes to its destination. The number and sequence of tables accessed by a given call varies according to several factors, for example, the origin and destination of the call, the number of digits dialed, and the signaling system used on the incoming trunk group.

Translations starts after call processing, which uses the trunk group tables, by analyzing the information provided by the incoming trunk. Information in the trunk group tables indexes one of the translations tables. Each translations table in turn indexes another until the call is fully translated, and can be routed.

3.1.4 How translations tables are datafilled

The process for datafilling translations tables differs depending on whether the switch is being datafilled for the first time, a PCL update is being applied, or routine modifications are being made to certain tables. For further information on general translation procedures, refer to the *North American DMS-100 Translations Guide*.

3.1.5 Preparing to datafill toll-free number service

Datafill tables for the following functional groups in the following order:

- NTS00006
- one of NTS00016 for TOLL SSP, or NTS00023 for End Office

Refer to the *North American DMS-100 Translations Guide*, for a description of any fields not shown here. (This guide discusses only those tables and fields that have direct impact on toll-free number service.)

3.1.5.1 Package name

NT00006 800Plus toll-free number service — Canada

3.1.5.2 Package number

NTS00006 (800Plus service, also known as 800P or 800+)

3.1.5.3 Feature numbers

The NTS00006 feature package consists of the functions summarized in Table 4.

Table 4 NTS00006 functions

Function number	Function name
NTS00002	End Office Display
NTS00016	888 Expansion

Note: For information on NTS00002 (End Office Display), refer to Chapter 4, “Datafilling end-office display”.

3.1.5.4 PCL applicability

NA006 and up

3.1.5.5 Description

The 800Plus—Canada software package provides support for toll-free number service on the SSP. The SSP communicates with operating company databases by launching an SS7 query to the SCP, where the database is kept. The SSP routes the toll-free number service call using information received in response to its query from the SCP.

Due to the success and popularity of the 800 service, the toll-free database ran out of available numbers. To add new numbers to support the service, the Industry Numbering Committee agreed to open 8XX (where the set is two matching digits) for toll-free number service codes. Under this agreement, 888 is the first code, and the following codes are reserved for future expansion: 877, 866, 855, 844, 833, and 822. Tables that have previously scanned the NPA for 800 have been modified to screen the new 8XX service access codes (SAC).

The NTS00016 (for TOLL SSPs) and NTS00023 (for end offices) software provide 888 toll-free number service functionality. Software to support each of the remaining 8XX codes will be offered under separate order codes.

3.2 Translations tables for NTS00006

The NTS00006 translation tables are described as follows and listed in the order they would be encountered during translations. To datafill these tables, reverse the sequence.

- Table STDPRTCT, subtable STDPRT provides standard pre-translator definitions that are used to determine whether a call is national, and the type of connection.
- Table CCTR contains country codes and pseudo country codes for international calls.
- Table HNPACONT determines whether the SSP toll-free number service method (database query) should be used for toll-free translations.
- Table NSCSCRN provides six-digit screening for SSP number service code (NSC) calls.
- Table NSCSNPA maps special routing codes to the originating numbering plan area (NPA).
- Table SSPTKINF defines all incoming and two-way toll trunks that support SSP NSC calls.
- Table C7LOCSSN provides the subsystem number for toll-free number service.
- Table C7GTTYPE defines the profile of a global title and associates the 800Plus application that is resident on the switch with its particular profile.
- Table C7GTT maps global titles for particular translation types to SS7 network addresses. This table determines whether a point code, or point code and SSN is sent in the message.
- Table C7NETSSN provides the set of remote point codes (PC) and subsystems, at remote PCs, where messages are routed by the signaling connection control part (SCCP).

- Table C7RTESET obtains the numeric values for the destination point code (DPC) and determines which route sets can be used.
- Table C7LKSET determines the characteristics of a linkset.
- Table C7LINK associates the physical aspects of a link with the logical view of the link as a member of a set of links, known as a linkset.
- Table NSCDEFS defines the number service code (NSC) calls that require access to operating company databases.
- Table NSCCARR associates the carrier with the multiple carrier routing that is supported by Southbound services.
- Table OFRT provides a route reference index for calls that originate in the switch.
- Table TRKGRP indicates whether Northbound conversion is to take place on incoming trunk groups.

  Note: For offices that require billings for unanswered 800Plus calls, ensure that call code 142 is datafilled against field UNANS_TOLL in table AMAOPTS.

The following MTP and SCCP tables are detailed in the *North American DMS-100 Translations Guide*:

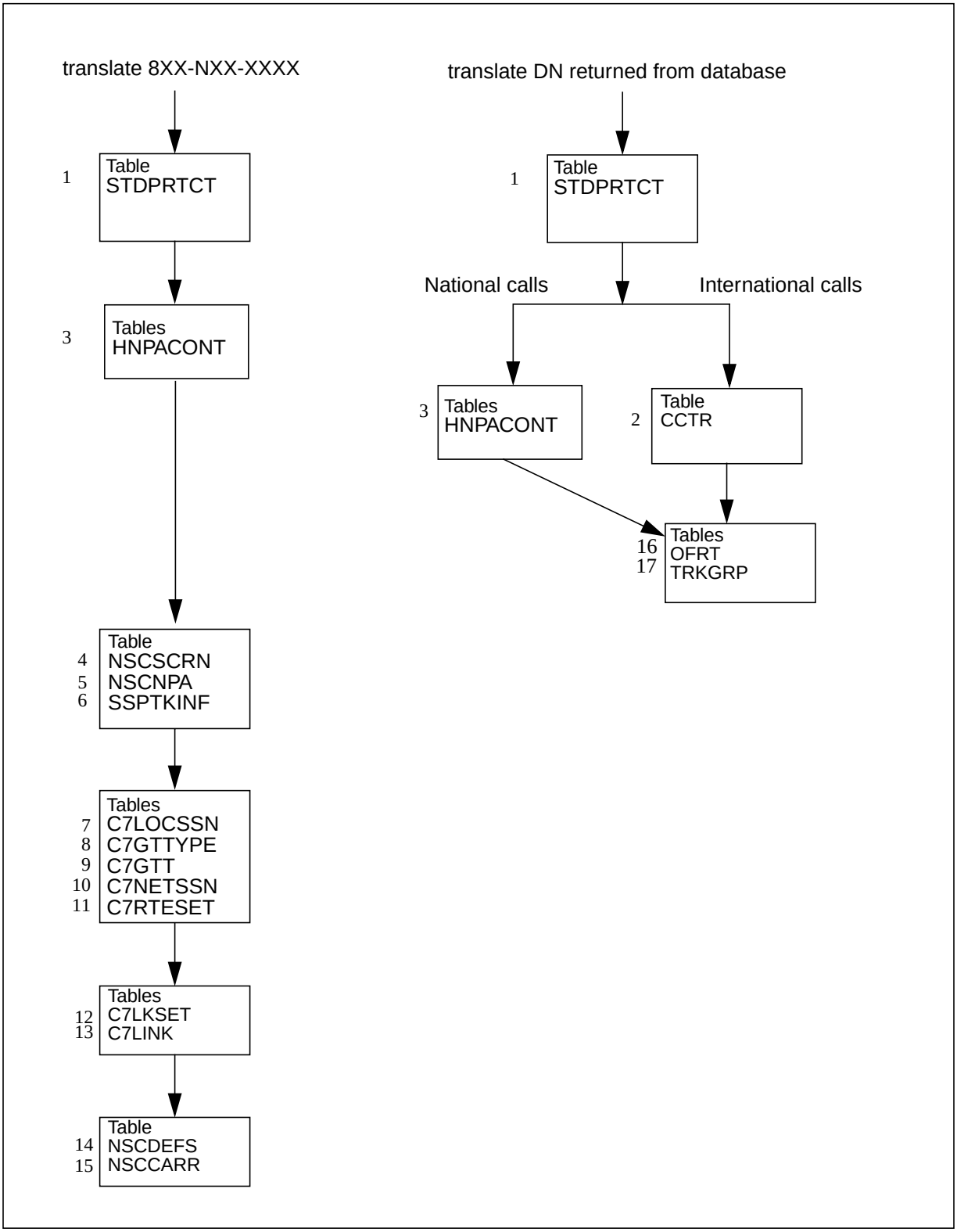
- Table C7LOCSSN
- Table C7GTTYPE
- Table C7GTT
- Table C7NETSSN
- Table C7RTESET
- Table C7LKSET
- Table C7LINK

The SSP toll-free number service translation process is shown in the flowchart in Figure 13.

Note that a 0- call and hotel calls requiring entry of the room number at a TOPS operator position references table HNPACONT to determine if the call is an NSC call before referencing table STDPRTCT.

Note that calls receiving NSC procesing at a TOPS SSP receive a variation of standard DMS translations on the number returned from the NSC database.

Figure 13 Table flow for NTS00006



3.2.1 Package limitations and restrictions

The following limitations and restrictions apply to the 800 Expansion—8XX Code software package:

- Only toll-free numbers of the form 8XX-NXX-XXXX are supported.
- 800Plus calls that return an 800, toll-free Service Access Code (SAC) are routed using INWATS translations.
- 800-to-00Y and 00Y-to-800 conversion is only supported for the Service Access Code (SAC) 800.
- The feature does not interact with the line information database (LIDB).

3.2.2 Package limitations and restrictions

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- 800-to-00Y and 00Y-to-800 conversion is only supported for the Service Access Code (SAC) 800.
- The feature does not interact with the line information database (LIDB).

3.2.3 Feature interactions

Not applicable

3.2.4 Activation/deactivation by end user

Not applicable

3.2.5 Billing

For 800Plus AMA billing, the toll-free call code is 142 and the structure code is 364. The 800Plus extended features use a feature type indicator (FTI) flag in module code 031 to denote which features are used in a call. Each feature has a specific position in an 8-bit field. If a call uses Overflow Call Routing (OCR), billing generates a module code of 121. The AMA billing record for Northbound/Southbound also uses a module code 021 to supply the carrier ID of the trunk.

The automated message accounting (AMA) record format for 800Plus only supports the Bellcore AMA standard.

Note: An 0- call, or a hotel call which goes to a TOPS operator position for entry of the room number generates a call code of 192 and a structure code of 752.

3.2.6 Station message detailed recording

Not applicable

3.3 Datafilling office parameters

The SSP uses several office parameters for the 800Plus software package. Refer to *Office Parameters Reference Manual* for more information on office parameters.

Table 5 supplies general information about the datafill for the tables required by 800Plus functionality.

Table 5 Datafilling office parameters for 800Plus

Parameter	Explanation and action
OFCVAR CREATE_PARTIAL_800_AMA	This parameter specifies whether the originating NPA is included in AMA billing records for calls on which the complete calling number is not available. The system does not generate a billing record for the 800 call if the complete calling number is not available and the variable is not active.
OFCENG NUM_OF_NSC_EXT_BLK	This parameter only appears in local or toll offices that have SSP capabilities. It specifies the quantity of number service call extension blocks that are required for toll-free calls. An NSC_EXT_BLK, which is used to store the number services call information, is attached to each toll-free call. For details of the engineering required, refer to the chapter “Chapter 2: Engineering toll-free number services” in this book.
OFCENG SOUTHBOUND	This parameter specifies the state of the Southbound feature on the SSP. It has three states: OFF, TRANSITION, and ON.
TOPSPARM NSC_800PLUS_QUERY_AT_POSITION	This parameter applies only to a TOPS SSP and specifies whether NSC processing is to be done for calls at a TOPS operator position. If set to Y, NSC processing is done at position. If set to N, the toll-free number is signalled to an adjacent switch where NSC processing can be applied.

3.3.1 Datafilling subtable STDPRTCT.STDPRT

This table sets the pre-translator route selector. It is accessed twice in an NSC call.

It is first accessed in the process of determining if the call is an NSC call.

Note that a 0- call at a TOPS operator position references table HNPACONT to determine if the call is an NSC call before referencing table STDPRTCT.

Table 6 shows the datafill procedure for table STDPRTCT subtable STDPRT necessary for the toll office SSP to begin the process of determining if the call is an NSC call.

This table is accessed again during the translations of the terminating DN returned from the database. The N selector should be used for both national and international numbers in this case.

Refer to the data schema section of the *North American DMS-100 Translations Guide* for a description of the other fields.

Table 6 Datafilling subtable STDPRTCT.STDPRT

Field	Subfield or refinement	Entry	Explanation and action
FROMDIGS		numeric	From digits Enter the digits to be translated. If the entry represents a block of consecutive numbers, enter the first number in the block.
TODIGS		numeric	To digits Enter the same value entered in the FROMDIGS field.
PRETRTE		see subfields	Pre-translation route This field consists of subfield PRERTSEL and its refinements, TYPCALL, NOPREDIG, and TRANSYS. See the appropriate subfield for its definition.
	PRERTSEL	N	pre-translator route selector Enter N.
	TYPCALL	DD	Type of call Enter DD for an Toll office or an end office/Toll office combination.
	TRANSYS	NA	Translation system Enter NA (National).

3.3.1.1 Datafill example for table STDPRTCT.STDPRT

Figure 14 shows sample datafill in subtable STDPRT.

Figure 14 Datafill example for subtable STDPRTCT.STDPRT

```
FROMDIGS     TODIG           PRETRTE
-------------------------------------------------------
800          800     N   DD  0  NA
```

3.3.2 Datafilling table CCTR

The country code table (CCTR) is required in local, toll or combined local/toll switching units that are arranged for direct dial overseas routing. All country codes that are not specified are routed to vacant code treatment.

Table CCTR is encountered by translation when the standard pre-translator specifies international (translation system equal to IN) for the prefix digits (for example, 011) that are dialed.

Table 7 shows the datafill procedure for table CCTR. This procedure contains only those fields that apply to toll-free number service. Refer to the data schema section of the *North American DMS-100 Translations Guide* for a description of the other fields.

Table 7 Datafilling table CCTR

Field	Subfield or refinement	Entry	Explanation and action
CCNAME		alphanumeric (up to 18 digits)	Other country code Enter a numeric country code.
GIVENC		see subfields	Given country code This field consists of subfield CCSEL and refinements subfield PCC.
	CCSEL	P or T	Country code selector Enter T when the code is a true country code. Otherwise, enter P when the code is a pseudo country code.
	PCC	alphanumeric (up to 18 digits)	Pseudo country code If subfield CCSEL is set to T and the switching unit is toll of combined local/toll, enter a pseudo country code.

Table 7 Datafilling table CCTR (continued)

Field	Subfield or refinement	Entry	Explanation and action
MINDIGSR		0-25	Minimum digits required include country code. Enter a value between 0 and 25.
MAXDIGSR		0-25	Maximum digits requires including country code. Enter a value between 0 and 25.
TMTORRTE		see subfields	Treatment or route reference Consists of subfield TRSEL and refinement subfields TREAT, TUPIC, TABID, KEY, and CUSTDIAL.
	TRSEL	T or D	Treatment or route selector Enter T where translation is to route to office route table, and datafill refinement TUPID. Enter D to route to treatment and datafill refinement TREAT.
	TREAT	alphabetic (up to 4 characters)	Treatment Enter the treatment to which translation is to route.
	TUPID	see subfields	Treatment or route reference Consists of subfields TABID and KEY.
	TABID	OFRT	TAble name When TRSEL = T, enter OFRT for office route table.
	KEY	1-1023	Index into the office route table Enter a value between 1 and 1023 for the index into the office route table to which treatment is to route.

Table 7 Datafilling table CCTR (continued)

Field	Subfield or refinement	Entry	Explanation and action
	CUSTDIAL	Y or N	Customer dialed Enter Y if the customer dials the code. Otherwise, enter N to prevent the customer for dialing the code. If the call originates from a local source (line, incoming CAMA trunk or local trunk with local source of origination) and refinement CUSTDIAL is set to N, the originator is routed to reorder treatment RODR.

3.3.2.1 Datafill example for table CCTR

Figure 15 shows standard input. It is not toll-free specific.

Figure 15 Datafill example for table CCTR

```
CCNAME GIVENCC MINDIGSR MAXDIGSR TMTORRTE
-----------------------------------------------------
416 T 416 2 20 T OFRT 212 Y
```

3.3.3 Datafilling subtable HNPACONT.HNPACODE

The NSCCODE field in table HNPACONT subtable HNPACODE indicates that database queries should be used for toll-free translations. If a routing component that is returned from an SCP includes a special routing indicator (transition number), or if the routing component is itself an 800 SAC, then the SCP is not queried again. Instead, regular INWATS routing is used and other 8XX SACs that 800 will not work.

The home numbering plan area code (HNPACONT) table and subtables contain information on records of the Home NPA.The home NPA code (HNPACODE) subtable lists the route, treatment, 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.

For toll-free call translations, specify the number service code. The NSC code type is used to access the toll-free number service database to obtain special routing and call handling information.

Note that for a 0- call and hotel calls requiring a room number at a TOPS operator position, NSC processing also requires that the table TOPSPARM parameter NSC_800PLUS_QUERY_AT_POSITION be set to Y.

For non-ambiguous 800Plus functionality table HNPACONT subtable HNPACODE is datafilled as follows:

```
800 800 nsc 800P
```

By introducing 8XX as a number service code (NSC), 8XX can be interpreted as an ambiguous code, if it is used as both an NPA and an NXX within a given office. To overcome this issue, the standard method of datafilling ambiguous translations must be used.

In this method, an NSC selector is added to the long route (ten-digits) of the AMBI HNPA selector in subtable HNPACONT.HNPACODE. This allows the

NXX to be routed using the short route (seven-digits), and it allows the NSC code 8XX to be routed using the long route (ten-digits).

A single line of datafill in subtable HNPACONT.HNPACODE is required in order to properly route NXX and NSC calls. The following is a sample line of datafill showing 888 as an ambiguous code where the timed method (TIM) is used to route the call to either a short route (seven-digits) of NPA 613 and NXX 888, or a long route (ten-digits) as an NSC toll-free 800Plus call.

```
888 888 AMBI TIM DN 613 888 NSC 800P
```

Note: In addition to the TIM selector, the PFX and OPF selectors can be used in subtable HNPACONT.HNPACODE. Refer to the data schema section of the *North American DMS-100 Translations Guide* for a description of available selectors.

Table 8 shows the datafill procedure for table HNPACONT subtable HNPACODE. This procedure contains only those fields that apply to toll-free number service. Refer to the data schema section of the *North American DMS-100 Translations Guide* for a description of the other fields.

Table 8 Datafilling subtable HNPACONT.HNPACODE

Field	Subfield or refinement	Entry	Explanation and action
FROMDIGS		numeric (3 digits)	From digits Enter a string if the leading three digits represent an office code within the home numbering plan area (HNPA). This number represents either a single code or the first in a block of consecutive codes that have the same input data. Enter 800 or, any other 8XX number (for example, 888). 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 in a block of consecutive numbers, enter the last number in the block.

Table 8 Datafilling subtable HNPACONT.HNPACODE (continued)

Field	Subfield or refinement	Entry	Explanation and action
CDRRTMT		see subfield	Code type, route reference and treatment This field consists of subfield CD and its refinements. See the appropriate subfield for its definition.
	CD	AMBI	Code type Enter AMBI for ambiguous codes and then datafill the refinements METHOD, SHORTRTE, LONGRTE, and CONTMARK. Enter NSC for unambiguous codes and datafill the refinements with 800Plus for toll-free number service. The entry in this subfield must correspond to the entry in the NSCCODE field of table NSCDEFS.
	METHOD	PFX TIM OPF	Method Enter one of the three selectors available: PFX, TIM, or OPF. As these are complicated selectors, refer to the data schema section of the *North American DMS-100 Translations Guide* for a complete description of the selectors.
	SHORTRTE	see subfields	Short route This subfield consists of refinements CD, SNPA and NXX. See the appropriate refinement for its definition.
		CD	Code Type Enter any valid code type. Code types include VCT, DN, STRG, and NPOSND.

Table 8 Datafilling subtable HNPACONT.HNPACODE (continued)

Field	Subfield or refinement	Entry	Explanation and action
CDRRTMT (continued)		SNPA	Terminating serving number plan area Enter the serving number plan area (SNPA) of the called terminating line directory number. If the operating company uses screening to intra-switch SNPAs, translation of the dialed digits proceeds to table OFCNAME using SNPA and NXX as the key.
		NXX	Terminating NXX Enter 888.
	LONGRTE	see subfields	Long route This subfield consists of refinements CD and NSCCODE. See the appropriate refinement for its definition.
		CD	Code Type Enter NSC.
		NSCCODE	Number service code Enter 800P for toll-free number service. This subfield must correspond to the entry in the NSCCODE field in table NCSDEFS. This parameter is used to index into table NCSSCRN to perform six-digit translation of toll-free calls.

Note: If an ambiguous code has been either added or deleted from subtable HNPACONT.HNPACODE, then the NOAMBIGC field in table HNPACONT must be incremented or decremented to reflect the changes that have been made. Refer to the data schema section of the *North American DMS-100 Translations Guide*, for a description of the fields in table HNPACONT.

3.3.3.1 Ambiguous datafill example for table HNPACONT, subtable HNPACODE

Figure 16 shows sample datafill for the 800Plus toll-free number service in subtable HNPACODE. In the example, the code type is NSC.

Figure 16 Datafill example for subtable HNPACONT.HNPACODE

```
FROMDIGS TODIGS CDRRTMT METHOD SHORTRTE LONGRTE
-------------------------------------------------------
888      888      AMBI  TIM    DN 613 888  NSC 800P
```

3.3.4 Ambiguous 8XX international calls and seven-digit toll calls

The introduction of the 8XX codes 888, 877, 866, 855, 844, 833, and 822 creates ambiguity not only with existing office codes, but also with existing country codes used in international dialing.

Specifically, the ambiguity between international calls and toll-free calls occurs when the DMS line feature Toll Deny (TDN) is on an originating line. This ambiguity results when calls to countries have both a country code and city code of 8XX (for example, Seoul, Korea—822). A call dialed with 822 is not blocked when TDN is subscribed to the line. The call is translated as a toll call, and not a toll-free call.

To accommodate these scenarios and to ensure that the international calls are blocked by TDN, all international call types require that field TRANSYS in subtable STDPRTCT.STDPRT be datafilled as "IN" (international). To resolve this problem, use the "V" selector in subtable STDPRT, as follows for the 1-833-7124 example DN:

```
18337124 18337124 V 8 DD 1 N NA 613 11 DD 1 N NA N
```

In this example, the "V" selector is used to differentiate between 8 and 11 digit calls:

- If 8 digits are dialed (for example, 1 + 7 digits) mark the call as DD (toll), strip the first digit, and put a 613 in its place, resulting in a ten-digit number. LCASCRN will not find the 833-7124 number that is associated with 613, which renders the call non-local, and thus a toll call.
- If 11 digits are dialed (for example, 1 + 8XX + 7-digit number), mark the call as DD (toll), and strip off the first digit, resulting in a ten-digit number beginning with 8XX. The AMBI selector then identifies the call as toll-free.

Table 9 provides a summary of system behavior for ambiguous 8XX numbers, the TDN feature and international dialing. For international calls, these examples use the IN selector in subtable STDPRTCT.STDPRT.

Table 9 Ambiguity for 8XX and TDN

If field TRANSYS is	Then
IN	International (IN) TDN calls with an 800 SAC are not blocked. All other 8XX SACs are blocked. 011 international calls must be datafilled with field TRANSYS in table STDPRTCT datafilled as IN, and only datafilled against selectors that use a TRANSYS other than IN.
NA or NO	National (NA) or no TRANSYS (NO) toll denied calls are not blocked. In this case, the toll-free check is applicable. Calls are not blocked if the dialed number begins with a toll-free SAC (that is, 8XX). Note: International calls are not blocked by TDN if they are routed through translations with TRANSYS set to NA or NO. Toll denied calls that only use code types S, T and V are also treated the same way as no TRANSYS (NO).

Table 10 shows the datafill procedure for subtable STDPRTCT.STDPRT. This procedure contains only those fields that apply to an 800 Expansion—8XX Code software package. Refer to the data schema section of the *North American DMS-100 Translations Guide* for a description of the other fields.

Table 10 Datafilling subtable STDPRTCT.STDPRT

Field	Subfield or refinement	Entry	Explanation and action
FROMDIGS		numeric	From digits Enter the digit or digits translated. If the entry represents a block of consecutive numbers, enter the first number in the block.
TODIGS		numeric	To digits Enter the same value entered in the FROMDIGS field.

Table 10 Datafilling subtable STDPRTCT.STDPRT (continued)

Field	Subfield or refinement	Entry	Explanation and action
PRETRTE		see subfields	Pre-translation route This field consists of subfield PRERTSEL and its refinements. See the appropriate refinement for its definition.
	PRERTSEL	V	Pre-translator route selector Enter V.
CASE1			Minimum digits received This field consists of the following subfields: DIGSIN, TYPCALL, NOPREDIG, RTESEL, TRANSYS and DISREGEN.
	DIGSIN		Minimum number of incoming digits Enter the minimum number of incoming digits.
	TYPCALL	DD	Type of call Enter DD for direct dial.
	NOPREDIG		Number of prefix digits Enter the number of digits that are interpreted as prefix digits.
	RTESEL	N	Route selector Enter N and datafill refinements TRANSYS and DISREGEN.
		NA or IN	TRANSYS — Translation system Enter NA if translation is to route to national translations. Enter IN if translation is to route to international translations (local/toll switching unit only).
	DIGREGEN		Digit regeneration Enter the digits that are prefixed to the digits received to generate the number required for digit analysis in the national or international translation.

Table 10 Datafilling subtable STDPRTCT.STDPRT (continued)

Field	Subfield or refinement	Entry	Explanation and action
CASE2			Maximum digits received This field consists of the following subfields: DIGSIN, TYPCALL, NOPREDIG, RTESEL, TRANSYS and DISREGEN.
	DIGSIN		Maximum number of incoming digits Enter the maximum number of incoming digits.
	TYPCALL	DD	Type of call Enter DD for direct dial.
	NOPREDIG		Number of prefix digits Enter the number of digits that are interpreted as prefix digits.
	RTESEL	N	Route selector Enter N and datafill refinements TRANSYS and DISREGEN.
	TRANSYS	NA or IN	Translation system Enter NA if translation is to route to national translations. Enter IN if translation is to route to international translations (local/toll switching unit only).
	DIGREGEN	N	Digit regeneration Enter N.

3.3.5 Datafilling table NSCDEFS

Table NSCDEFS is used to define the types of number services accessible on the node and the options available to those individual services.

Parameter TIMEOUT in this table is used to set the database response time. It has a default value of 3 sec. If a response is not received within this time, the call is given Reorder (RODR) treatment.

Possible loss of service

Do not set the parameter TIMEOUT to a value that is greater than 29. A value greater than 29 may cause a SWERR and cause a loss of service to all toll-free calls.

Table 11 shows the datafill procedure for table NSCDEFS. This table contains only those fields that apply to toll-free number service. Refer to the data schema section of the *North American DMS-100 Translations Guide* for a description of the other fields

Table 11 Datafilling table NSCDEFS

Field	Subfield or refinement	Entry	Explanation and action
NSCODE		800P	Number service code Enter 800P as the number service code. It is referenced from subtables HNPACONT.HNPACODE and STDPRTCT.STDPRT. It is also used in some of the International translation tables. Ensure that when adding or deleting this data element that the same is done for the other tables.
TIMEOUT		0 to 600	SSP database response time-out Enter the time, in seconds, to wait for a response from the SCP database. The recommended value for field TIMEOUT is 3 seconds. The range is 0 to 32 767 seconds. If a response is not received within this time, the call is given Reorder (RODR) treatment. ***Note***: Do not set this field to a value greater than 29.

Table 11 Datafilling table NSCDEFS (continued)

Field	Subfield or refinement	Entry	Explanation and action
OPTIONS		see subfield	Options This field is a vector of up to 12 multiples of subfield OPTION and its refinements. See the appropriate subfields for definitions.
	OPTION		Separate each OPTION with a single space. If less than 12 options are required, end the list with a $ (dollar sign).
		NSCNUM	Three-digit service code number Enter NSCNUM for the three-digit service code number option. If the entry in subfield OPTION is NSCNUM, datafill this refinement. Enter a three-digit service code number (for all toll-free service, enter 800).
		NSC0ZZ	Three-digit 0ZZ code If the entry in subfield OPTION is NSC0ZZ, datafill this refinement. This refinement allows an operating company to customize the NSC code. Enter a three-digit code starting with 0 (zero). The second and third digits can be any number between 0 and 9. NSC0ZZ contains a prefix value that is outpulsed for Southbound calls. 0ZZXXX is used to find the Southbound route in table STDPRTCT after the database query. Tuple 0ZZ (NSC0ZZ) + XXX in table STDPRTCT must be datafilled with proper route selections that match this table.

Table 11 Datafilling table NSCDEFS (continued)

Field	Subfield or refinement	Entry	Explanation and action
OPTIONS (continued)	OPTION	NSCALARM ALARMTIM	SCP database response time-out If the entry in subfield OPTION is NSCALARM, datafill this refinement. It is used to trigger a Freephone Services major alarm if two queries to the SCP database time out before the time interval in ALARMTIM has elapsed. Datafill to ON to enable. The default is ON. Enter the number of minutes that must elapse during two SCP queries, in order to trigger the alarm. This time is also used to automatically clear the alarm, if two SCP queries occur without time-outs. The range is 1-1440 minutes. The default is 10.
		COMFORT	Comfort tones capability Enter COMFORT if the office has the Comfort Tone feature for the NSC service (field NSCODE is set to 800P) to have comfort tone applied to the originating agent during database queries. This is only valid on lines or MF trunks.
		10DGTRTG	Ten-digit translations capability Enter 10DGTRTG to indicate that ten-digit routing is desired for all 800Plus calls. If the option 10DGTRTG is not present, and the NPA of the routing number returned by the database matches the NPA of the calling number, then seven digit routing is used.
		CONATIM	Call Overflow no answer timer Enter the CONATIM in seconds to indicate how long OCR will spend on each idle DN before trying the next one.

3.3.6 Datafill example for table NSCDEFS

Figure 17 shows sample datafill in table NSCDEFS. In the example, the waiting time for a response from the SSP is 3 sec.

Figure 17 Datafill example for table NSCDEFS

```
NSCODE    TIMEOUT
OPTIONS
-----------------------------------------------------
800P     3
 (NSCNUM 800) (NSC0ZZ 099) (COMFORT)
 (10DGTRTG) (NSCLARM ON) (ALARMTIM 10)(CONATIM 2)$
```

3.3.7 Datafilling table NSCSCRN

Table NSCSCRN provides six-digit (NSC-NXX) screening that is used for the previous method of translating toll-free calls.

Toll-free number service calls with 800 datafilled in table NSCSCRN are translated using the datafilled translator selector. Number service calls without 800 NXX datafilled in table NSCSCRN are translated using the SSP 800Plus method.

Table 12 shows the datafill procedure for table NSCSCRN. This contains only those fields that apply to toll-free number service. Refer to the data schema section of the *North American DMS-100 Translations Guide*, for a description of the other fields

Table 12 Datafilling table NSCSCRN

Field	Subfield or refinement	Entry	Explanation and action
NSCODE		800P	Number service code (NSC) The number services code is entered in this field. For toll-free number services, enter 800P.
FROMNXX		vector of up to 18 digits from 000 to 999	From three-digit code Enter a three-digit code that represents either a single code, or the first in a block of consecutive codes.

Table 12 Datafilling table NSCSCRN (continued)

Field	Subfield or refinement	Entry	Explanation and action
TONXX		000 to 999	To three-digit code Where field FROMNXX represents a single code, enter the same three-digit code in this field. Where field FROMNXX represents the first three-digit code in a block of consecutive three-digit codes, enter the last three-digit code in the block.
XLADATA		see subfield	Code type route reference This field contains subfield NSCCD and its refinements. See the appropriate subfields for definitions.
	NSCCD		Code type Enter VCT when call is to be routed to treatment and complete the following field TMT. Otherwise, determine the type of call and complete subfield RR following. Refer to subtable HNPACONT.HNPACODE for a description of code types.
	TMT	alphanumeric (4 characters)	Treatment When NSCCD equals VCT, enter the treatment used to index into the appropriate TMTCNTL subtable.
	RR	0 to 1023	Route reference index Enter the route reference index of the route list in table HNPACONT subtable RTEREF to which translation is to proceed.

3.3.7.1 Datafill example for table NSCSCRN

Figure 18 shows sample datafill in table NSCSCRN. In the example, the number service code is 800Plus.

Figure 18 Datafill example for table NSCSCRN

```
NSCODE FROMNXX TONXX X LADATA
-----------------------------------------------------

800P   011     022 VCT MSCA
800P   122     123 INWO 0
800P   200     300 INWO 0
800P   400     500 INWC 0
```

Once a call is recognized as an NSC call, tables NSCSNPA and SSPTKINF are used to obtain the information required for an SCP query.

3.3.8 Datafilling table NSCSNPA

Table NSCSNPA maps 00Y and special routing codes (SRC), that is 0XY codes, to originating numbering plan area (NPA) codes. OXY codes can use 010 to 099, and the two numbers (XY) do not have to be the same.

Possible loss of service

800 is the only SAC for which 00Y or 0XY codes work.

An office may take calls from several numbering plan areas (NPAs) and forward them to a single SSP. In some cases, no originating DN information is passed to the toll office from the originating office. Thus, the SSP gets the information that the calls came from a toll office, but the information did not include the originating NPA of the call.

The SCP needs to process the NPA where the call originated because this must be sent to the terminating office for billing purposes. Hence, the toll office inserts an 00Y or an 0XY code in place of an 800 code, since it can determine the originating NPA by noting the trunk on which the call arrived.

The SSP uses table NSCSNPA to determine the NPA for the query that it forwards to the SCP. In the SSP, the 800 number received from other offices may be in either the form 00Y+NXX+XXXX or the form 0XY+NXX+XXXX. The corresponding SNPA for the calling office is

retrieved from table NSCSNPA. If the 00Y or 0XY is not found in table NSCSNPA, the 800 number service call receives vacant code treatment.

Under specific circumstances, the 00Y or 0XY code can be received by the network. Those circumstances require all of the following conditions to be met:

- The routing number that is contained in the SCP response message must be SAC 800
- An 00Y or 0XY code that corresponds to the originating NPA must be datafilled in table NSCSNPA.

Table 13 on page 86 shows the datafill procedure for table NSCSNPA. This contains only those fields that apply to toll-free number service. Refer to the data schema section of the *North American DMS-100 Translations Guide* for a description of the other fields.

Table 13 Datafilling table NSCSNPA

Field	Subfield or refinement	Entry	Explanation and action
SRC		000 to 999	Special routing code Enter the special routing code that is used by the end office or tandem office to indicate the originating NPA or NSC call is from a coin line. For 800Plus, enter the special routing code in the range of 000 to 009.
SNPA		000 to 999	Originating NPA Enter the originating SNPA. This field has a range of 000 to 099.
COINCALL		Y or N	Coin station call Enter Y if the special 0YY entered in field SAC indicates that the call is from a coin line. Otherwise, enter N.

3.3.8.1 Datafill example for table NSCSNPA

Figure 19 shows sample datafill for table NSCSNPA.

Figure 19 Datafill example for table NSCSNPA

```
SRC  SNPA     COINCALL
-------------------------------------------------------
002   613         N
033   416         Y
```

3.3.9 Datafilling table SSPTKINF

Table SSPTKINF provides the operating company with the capability to assign

- the originating LATA number (not used)
- an NXX (if it is a direct trunk group from an end office)
- a coin-traffic type to each incoming or two-way trunk group that carries number service calls
- carrier information for the Northbound feature

The NXX is used as part of the SSP database query information, and for the SSP AMA records, if calling DN is not available from the incoming trunk.

Any trunk groups that handle NSC traffic must have an entry in table SSPTKINF.

These calls are received over a direct trunk group from an end office with no calling number, for example, ONI/ANI_FAIL calls from SC/TOPS trunks, or calls from IT trunks. Datafill all incoming or two-way trunks that support SSP NSC calls. If the trunk is not datafilled in table SSPTKINF, then calls receive vacant code treatment.

Table 14 shows the datafill procedure for table SSPTKINF. This table contains only those fields that apply to toll-free number service. Refer to the data

schema section of the *North American DMS-100 Translations Guide* for a description of the other fields.

Table 14 Datafilling table SSPTKINF

Field	Subfield or refinement	Entry	Explanation and action
SSPTK		alphanumeric (1 to 16 characters)	SSP trunk CLLI Enter the common language location identifier (CLLI) of the trunk group handling NSC calls, incoming or two-way.
ORIGLATA		alphanumeric 3 characters (0 to 9, B, C, D, E, or F)	Originating LATA number The originating LATA at the other end of the trunk has a LATA number that is entered here. Mandatory, but not used by 800Plus.
DIRECTTK		see subfields	Direct trunk This field contains subfield DIRECT and refinement NXX.
	DIRECT	Y or N	Direct Enter Y if this is a direct trunk group and complete refinement NXX. Otherwise, enter N.
	NXX	numeric (3 digits)	Originating office code When DIRECTTK is Y and the ANI is not available, enter the originating office code (NXX). The existence of this field is dependent on the value of the data in field DIRECTTK. If the value in DIRECTTK is N, this field is unavailable for datafill.
COINTRAF		COMB COIN NONCOIN	Trunk traffic type Enter COMB if the trunk group carries both coin and non-coin traffic. Enter COIN if the trunk group only carries coin traffic. Enter NON-COIN if the trunk group carries non-coin traffic only.

Table 14 Datafilling table SSPTKINF (continued)

Field	Subfield or refinement	Entry	Explanation and action
CARRIER		numeric	800Plus carrier type Enter the 3-digit or 4-digit carrier code for the trunk group. Canadian toll-free traffic uses this value to supply a carrier code for the AMA record for Northbound calls. Otherwise, enter 0.

3.3.9.1 Datafill example for table SSPTKINF

Figure 20 shows sample datafill in table SSPTKINF. In the example, the originating office code is 621.

Figure 20 Datafill example for table SSPTKINF

```
SSPTK   ORIGLATA   DIRECTTK    COINTRAF    OPTIONS
-------------------------------------------------------
EAIN    000        Y 621       COMB        (carrier 288) $
```

3.3.10 Datafilling table NSCCARR

Table number service code 800Plus Southbound carrier ID validation table (NSCCARR) provides the following information:

- carrier name
- carrier ID

The carrier name and ID are required for the SSP AMA records for both Southbound and Northbound 800Plus calls. This is especially necessary in a multiple carrier environment.

This table is used in a Toll SSP office only.

Table NSCCARR is used to validate the carrier identification returned in the database response message. Only the carrier names and IDs in this table are considered valid.

Table NSCCARR is datafilled with carriers that either the SSP or the gateway SSP (SSPGW) directly access. If the SSP does not have direct access, but

another SSP or SSPGW office does, then datafill that carrier information in table NSCCARR.

Table 15 shows the datafill procedure for table NSCCARR. The table contains only those fields that apply to toll-free number service. Refer to the data schema section of the *North American DMS-100 Translations Guide* for a description of the other fields.

Table 15 Datafilling table NSCCARR

Field	Subfield or refinement	Entry	Explanation and action
CARRNAME		alphanumeric (up to 16 characters)	Carrier Name Enter the name of a connected carrier.
CARRID		numeric	Carrier Identification Enter the three-digit code that identifies this carrier.

3.3.10.1 Datafill example for table NSCCARR

Figure 21 shows sample datafill in table NSCCARR.

Figure 21 Datafill example for table NSCCARR

```
CARRNAME                  CARRID
-------------------------------------------------------

ATT                       288

ITT                       488

MCI                       120
```

3.3.11 Datafilling table TRKGRP

Table trunk group (TRKGRP) is used to specify the Northbound option, which converts the U.S. CHG number parameter to the Canadian CPN parameter.

Table 15 shows the datafill procedure for table TRKGRP. This contains only those fields that apply to 800Plus toll-free number service. Refer to the data

schema section of the *North American DMS-100 Translations Guide* for a description of the other fields.

Table 16 Datafilling table TRKGRP

Field	Subfield or refinement	Entry	Explanation and action
GRPINFO	OPTION	CHGNUM	To enable the 800 Plus Northbound option, enter CHGNUM.

3.3.11.1 Datafill example for table TRKGRP

The following example shows sample datafill for table TRKGRP.

Figure 22 Datafill example for table TRKGRP

```
GRPKEY
                                                    GRPINFO
-----------------------------------------------------------
S5BBB807OPTCA
  OC 0 NDPGP NCRT CA     MIDL WK N N OG.CHGNUM $
```

3.4 Billing Suppression for 8XX Calls

3.4.1 Feature number

Not applicable

3.4.2 Feature package

Not applicable

3.4.3 Feature package prerequisites

Not applicable

3.4.4 Description

In certain site configurations, 8XX calls can generate double billing. For the North American dialing plan, the dialed digits of 800, 822, 833, 844, 855, 866, 877, 888 and 900 are considered number service codes (NSC).

When a ten-digit number is dialed that begins with these digits, a database query is sent to the service control point (SCP) from the service switching point (SSP) equipped end office that originated the call. The response from this query tells the SSP end office how the call is to be routed and what kind of billing record to generate.

If the end office where the NSC call originates does not have SSP functionality, then the switching system providing the SSP function can be a combined end office and toll office SSP.

In a non-SSP end office when a call originates, the call is routed to the toll office SSP that will do the database query, the ultimate routing of the call, and the generation of the automatic message accounting billing record. An AMA billing record is also generated by the end-office. As a result, two AMA records are generated for one call (one at the toll office SSP and one at the non-SSP end office).

3.4.5 Translations table flow

Not applicable

3.4.6 Feature limitations and restrictions

None

3.4.7 Feature interactions

Not applicable

3.4.8 Activation/deactivation by the end user

Not applicable

3.4.9 Billing

Billing suppression for 8XX calls functionality eliminates the additional AMA record that is created at the originating non-SSP end office.

3.4.10 Station message detailed recording

Billing Suppression for 8XX Calls does not affect Station Message Detailed Recording.

3.4.11 Datafilling office parameters

Billing Suppression for 8XX Calls does not affect office parameters.

3.4.12 Datafill sequence

Table 17 requires datafill to implement billing suppression for 8XX calls.

Table 17 Datafill for billing suppression

Table	Description
STDPRTCT.AMAPRT	Generates and suppresses Bellcore-formatted AMA records.

3.4.13 Datafilling subtable STDPRTCT.AMAPRT

Sub-table STDPRTCT.AMAPRT is indexed by the same leading digits as received by subtable STDPRTCT.STDPRT. Subtable STDPRTCT.AMAPRT

is datafilled when the operating company needs to generate Bellcore-formatted AMA records independent of the fixed translation schemes.

In the office that requires the AMA record for a 1-8XX-NXX-XXXX call to be suppressed, subtable STDPRTCT.AMAPRT must be datafilled with the NONE and OVRDALL options for the translated digit string.

For example, to suppress the record for a 1-888-NXX-XXXX call, the subtable is datafilled as follows:

```
> 1888 1888 NONE OVRDALL N
```

This suppresses any regular toll billing for this call. However, it is not possible to suppress the generation of call code 110 AMA records with this method. That is, the 8XX call must be routed to the Toll office SSP as a direct dialed (DD) call.

Table 18 shows the datafill for table STDPRTCT, subtable AMAPRT. This procedure contains only those fields that apply to billing suppression for E8XX calls. Refer to the data schema section of the *North American DMS-100 Translations Guide,* for a description of the other fields.

Table 18 Datafilling subtable STDPRTCT.AMAPRT

Field	Subfield or refinement	Entry	Explanation and Action
FROMDIGS		numeric (vector of a maximum of 18 digits)	From digits Enter the digits to be translated. If the entry represents a block of consecutive numbers, enter the first number in the block.
TODIGS		numeric (vector of a maximum of 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.
AMARSLT		see subfields	AMA result This field consists of subfields CALLCODE and SFPRSNT.

Table 18 Datafilling subtable STDPRTCT.AMAPRT (continued)

Field	Subfield or refinement	Entry	Explanation and Action
AMARSLT (continued)	CALLCODE	NONE	Call code Enter NONE. This is entered because there is no change being made to the call code generated.
		OVRIDLT	Override non-IC AMA records (local/toll) Enter OVRDALL.
	SFPRSNT	N	Service feature present Enter N.

3.4.13.1 Datafill example for subtable STDPRTCT.AMAPRT

Figure 23 shows sample datafill for subtable STDPRTCT.AMAPRT. In the example, all 1-888-NXX-XXXX calls are suppressed from generating AMA records at the local office.

Figure 23 Datafill example for subtable STDPRTCT.AMAPRT

```
FROMDIGS     TODIG           PRETRTE
-------------------------------------------------------
1888 1888   NONE     OVRDALL N
```

Chapter 4: Datafilling end-office display

This chapter describes the datafill needed to support End-Office Display (EOD) service. Read this entire section carefully before proceeding with datafill. For further information on translations, refer to the *North American DMS-100 Translations Guide*.

- "Preparing to datafill end-office display service," on page 96 explains the order in which toll-free number service data tables should be datafilled.
- "Datafill sequence," on page 98 provides a procedure for datafilling 800Plus EOD service on an SSP.
- "Using SERVORD for EOD," on page 101 provides information on provisioning using Service Orders.

To perform translations, the switch must access data stored in the central control memory called the translations database.

The translations database contains data tables. Each table has a specific purpose and contains a certain type of data. Every table has a name (table names are in upper-case). A table consists of horizontal rows and vertical columns of data. Each row contains one record of data and is called a tuple. Each column is called a field.

For further information, refer to the *North American DMS-100 Translations Guide*.

4.1 Preparing to datafill end-office display service

For EOD service, the customer must subscribe to the correct product for the type of service they require, at both the connected service control point (SCP) and the local, terminating end-office. The same operating company can subscribe to one or more types of EOD service. The options are

- NTS00002 800Plus End-Office Display for support of Centrex or automatic call distribution (ACD) and basic EOD functionality
- NTS00007 to enable subscriptions for each directory number (DN)
- NTS00008 for support of call management services (CMS)

Refer to the *North American DMS-100 Translations Guide*, for a description of any fields not shown here. (This guide discusses only those tables and fields that have direct impact on toll-free number service).

4.1.1 Package name

NTS0002 End-Office Display

4.1.2 Package numbers

NTS00006 800Plus — CANADA is required for EOD. Refer to the feature packaging below for the Function numbers for each type of service.

4.1.2.1 Feature numbers

NTS00002 consists of the functions listed in Table 19.

Table 19 EOD functions

Function number	Function name
NTS0007	Per DN subscription controls (ACD and Centrex)
NTS0008	Call Management Services (CMS) restructure

4.1.3 PCL applicability

NA006 and up

4.1.4 Description

The 800Plus package resides on the SSP. The 800Plus—Canada software package provides support for toll-free number service on the SSP. The SSP communicates with operating company databases by launching an SS7 query to the SCP where the database is kept. The SSP routes the toll-free number service call using information received in response to its query from the SCP.

End-Office Display is an optional feature supported by the 800Plus—Canada software package. For 800 number calls, this feature provides 800Plus customers with the 800 number dialed by the calling party (DNID), and the DN of the calling party (CID), if a customer subscribes to both. This feature

requires CCS7 connectivity on every leg of the call, as well as, ISUP on every leg of the call, if termination cause notification is required.

4.1.5 Translations tables

Descriptions of the NT00002 translation tables are as follows.

- Table CUSTSTN provides read-only data on the subscribed options at the MAP level.
- Table IBNLINES provides field LINE_OPTIONS to add CID or DNID displays to a CMS or CLASS on Centrex line.
- Table OPTOPT provides external symbols to appear on phone displays, including CID and DNID.
- Table KSETLINES provides field LINE_OPTIONS to add CID or DNID displays to an ACD/Centrex line.
- Table RESOFC provides tuples to enable office-wide optionality for CID and DNID.

4.1.6 Package limitations and restrictions

The following limitations and restrictions apply to the End-Office Display package:

- A customer can subscribe to either CID, DNID, or both on a per DN basis.
- Separate packages exist for CMS and ACD/Centrex (which includes Meridian phones that use the p-phone protocol for switch-CPE communication, and have a screen equal to or larger than 2 lines x 16 characters).
- CCS7 connectivity must exist from the originating DN to the terminating end-office.
- In order to support terminating cause display, ISUP connectivity must exist from the SSP to the called DN.

4.1.7 Feature interactions

Not applicable

4.1.8 Billing

No special billing applies to End-Office Display at the end office.

4.1.9 Activation/deactivation by end user

Not applicable

4.1.10 Station message detailed recording

Not applicable

4.2 Datafill sequence

Table 20 summarizes the datafill tables required to support toll-free number service on SSPs. The tables are listed in the order in which they are to be datafilled.

Table 20 Datafill tables required for NTS00002

Table	Purpose of table
CUSTSTN	Lists EOD subscribed options installed with the ONP
KSETLINE	Defines line options to enable CID and DNID on ACD and Centrex systems on a per DN basis
IBNLINES	Defines line options to enable CID and DNID on CMS systems on a per DN basis
RESOFC	Provides tuples to enable end-office-wide optionality for CID and DNID on the SSP

Note: Note: For offices that require End-Office Display, datafill is required to create a customer group in table CUSTENG and a line treatment group in table LINEATTR.

4.2.1 Table CUSTSTN

This table supplies 800EOD tuples to record subscription to NTS-CID and NTS-DNID. However, any attempt to modify or add 800EOD tuples at the MAP display is not allowed. Operating companies can delete the tuples after the one night process (ONP), if service is cancelled.

4.2.1.1 Dump and restore

To change from a release that uses the customer group CID and/or DNID options to the newer line options, the existing CUSTSTN 800EOD tuples have to be dumped and restored. During the dump and restore, the data is used to assign the NTS-CID and/or NTS-DNID line options to the appropriate lines in the correct tables.

4.2.2 Datafilling table KSETLINE

End-Office Display functionality checks the customer group of every line in table KSETLINE for NTS-CID and NTS-DNID option subscriptions for Centrex customers.

End-Office Display functionality assigns the appropriate NTS-CID or NTS-DNID (or both) line options to the line if the line subscribes to any customer group options, and meets all of the following requirements:

- The End-Office Display ACD/Centrex package is subscribed for each DN at the end-office and the toll-office SSP.
- The key set has minimum display capabilities of two lines and 16 characters.
- For communications the line must support the MBS Switch-CPE protocol.

4.2.2.1 Datafill example

The following table illustrates example datafill for table KSETLINE.

Figure 24 Datafill example for table KSETLINE

```
KSETKEY FORMAT
                                                        DNRESULT
-----------------------------------------------------------
HOST 00 1 14 24 DN Y 7223250 CUST_GRP 0 1 613 (NTS_CID)
(NTS_DNID)
HOST 00 1 16 06 DN Y 7229971 CUST_GRP 0 0 613 INCALLS N
ACD_GRP 0 N (NTS_CID) (NTS_DNID)
```

4.2.3 Datafilling table IBNLINES

End-Office Display functionality checks the customer group of every line in table IBNLINES for CID and DNID option subscriptions for CMS customers. If the line subscribes to any customer group options, and meets all of the following requirements, EOD assigns the appropriate CID or DNID line options to the line. The following options are required:

- the EOD package for CMS
- a Line Class Code (LCC) of RES or IBN

The following two line options are added to table IBNLINES:

- CID for CMS or CLASS Centrex systems
- DNID for CMS or CLASS Centrex systems

Table 21 shows the datafill for table IBNLINES. This table contains only those fields that apply to toll-free number service. Refer to the data schema section

of the *North American DMS-100 Translations Guide* for a description of the other fields.

Table 21 Datafilling table IBNLINES

Field	Subfield	Entry	Explanation and action
	LINE_OPTION	NTS_CID	The entry activates the CID option
	LINE_OPTION	NTS_DNID	The entry activates the DNID option

4.2.3.1 Datafill example for table IBNLINES

The following example shows sample datafill for the EOD service in table IBNLINES.

Figure 25 Datafill example for table IBNLINES

```
LEN
   DNNO
                                                RESULT
- - - - - - - - - - - - - - - - - - - - - - - - - - - - -
HOST  01 0 02 01
           0  DT STN RES 9671009 405 905 (NTS_CID) (NTS_DNID) $
```

4.2.4 Datafilling table RESOFC

Table RESOFC contains NTS-CID and NTS-DNID tuples that enable or disable CMS EOD functionality for the whole switch.

When a tuple enables an option, the 800Plus EOD CMS software enables for that option on the switch.

When the removal of a tuple disables an option, EOD information for toll-free calls cannot display separately. For example, after disabling the CID option, the system returns to CND, instead of CID.

Table 22 Datafilling table RESOFC

Field	Subfield	Entry	Explanation and action
	NTS-CID	(Y|N)	Y is enabled, and N is disabled.
	NTS-DNID	(Y|N)	Y is enabled, and N is disabled.

4.3 Using SERVORD for EOD

Table 23 lists the supported End-Office Display SERVORD commands.

Table 23 Servord commands

Command	Description
ADD	Add hunt group or Call Pickup members
ADO	Adds options to individual lines and Hunt group members
CHG	Change translation-related attributes, including the LCC of the line
DEO	Deletes options from individual lines and hunt group members
EST	Establishes Hunt groups, Call Pickup groups or preferential Hunt lists
NEW	Establishes initial service for all non-Hunt lines
NEWACD	Establishes initial service for a new ACD business set

4.3.1 Using the NEW command to add EOD options to a line

To create a RES line with 800Plus EOD NTS_CID and/or NTS_DNID options use the NEW SERVORD command, and assign 1FR for line class code (LCC).

Figure 26 Using the SERVORD NEW command to add CID and DNID options

```
SERVORD
>NEW
SONUMBER:   NOW 93 2 3 PM
>
DN:
>6211414
LCC:
>1FR
LTG: 0
>102
LEN or LTD:
>0 1 12 23
OPTION:
>NTS_CID
OPTION:
>NTS_DNID
OPTION:
$

COMMAND AS ENTERED
NEW NOW 93 2 3 PM 6211414 1FR 102 0 1 12 23 NTS_CID NTS_DNID
$ ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>Y
There is a RES-specific option in the option set. Line will
become a RES line.
```

4.3.2 Adding EOD options to a RES or POTS line

Only RES lines can use the ADO SERVORD command to add either NTS-CID (caller id) or NTS-DNID (dialed number id) options to the line. If a plain ordinary telephone service (POTS) has its table OFCVAR, parameter RES_SO_SIMPLIFICATION, sub-parameter RES_AS_POTS set to “Y”, adding NTS-CID and/or NTS-DNID will change it to a RES line.

Figure 27 Adding CID and DNID options to a POTS line

```
SO
>ADO
SONUMBER:   NOW 93 2 3 PM
>
DN_OR_LEN:
>6215237
OPTION:
>nts_cid
OPTION:
>nts_dnid
OPTION:
>$
COMMAND AS ENTERED
ADO NOW 93 2 3 PM 6215237 (NTS_CID) (NTS_DNID) $ ENTER Y TO
CONFIRM, N TO REJECT OR E TO EDIT
>Y
There is a RES-specific option in the option set. Line will
become a RES line.
```

Note: If the line is already a RES line, the last message is not displayed.

4.3.3 Deleting EOD options from a line

When a POTS line has the EOD options deleted from the line, it reverts to a POTS line from being a RES line. The following table illustrates DEO.

Figure 28 Deleting CID and DNID options from a RES line

```
SO
>DEO
SONUMBER:   NOW 93 2 3 PM
>
DN_OR_LEN:
>6215237
OPTION:
>nts_cid
OPTION:
>nts_dnid
OPTION:
>$
COMMAND AS ENTERED
DEO NOW 93 2 3 PM 6215237 (NTS_CID) (NTS_DNID) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>Y
No RES specific option left on the option set. Line will
become a POTS 1FR line.
```

If at least one RES option remains assigned to the line, the last message is not displayed.

4.3.4 Adding EOD options to a Centrex line

The example shown in Figure 29 shows how to use SERVORD to add EOD options to a Centrex line.

Figure 29 Adding CID and DNID options to a Centrex line

```
SO
>ADO
SONUMBER:   NOW 93 2 3 PM
>
DN_OR_LEN:
>7223250
OPTKEY:
>1
OPTION:
>nts_cid
OPTKEY:
>1
OPTION:
>nts_dnid
OPTKEY:
>$
COMMAND AS ENTERED
ADO NOW 93 2 3 PM 7223250 (1 NTS_CID) (1 NTS_DNID) $ ENTER
Y TO CONFIRM, N TO REJECT OR E TO EDIT
>Y
```

Chapter 5: Monitoring toll-free number service

This chapter describes toll-free number service administration procedures. It also contains information that is pertinent to long-range planning, provisioning engineering, and network design.

- "Understanding toll-free number service," on page 107 provides a brief description of routing of toll-free number service calls.
- "Defining administration functions," on page 107 provides an overview of administrative functions.
- "Using OMs to evaluate toll-free number service performance," on page 110 provides a description of the operational measurements (OMs) that can be used to monitor performance of toll-free number services on an SSP.
- "Evaluating toll-free number service performance factors," on page 117 provides information on how to use performance factors to evaluate switch performance.

5.1 Understanding toll-free number service

Toll-free number service uses service switching points (SSP) and service control points (SCP) in the signaling system 7 (SS7) network to provide toll-free calling. Toll-free calling allows the called party to pay long distance charges. Businesses using these services can provide callers with convenient, cost-free access to telephone services.

When a caller dials a toll-free number, the SSP at which the call originates sends a query to the SCP for routing information. The SCP retrieves the routing information from its database, and sends this information to the SSP in a response message. The SSP then routes the call accordingly.

5.2 Defining administration functions

This section explains the role of the administrator in monitoring the various performance factors and performance indicators of toll-free number services.

5.2.1 Role of the administrator

The administrator's responsibilities include monitoring the performance of the SSP. Typically, the administrator delivers hardware and software performance information to the operating company's maintenance and engineering groups. The administrator collects data that is used to calculate provisioning requirements, and provide early indications of system faults.

5.2.1.1 How administrators monitor service performance

Use the OMs that are described in this chapter to monitor the performance and efficiency of toll-free number service on the SSP and its associated components.

5.2.2 Performance factors

Performance factors measure system performance indicators that affect the efficient operation of toll-free number services. Toll-free number service have several traffic-sensitive areas that can exceed engineered limits. Monitor these areas using the OMs described in this chapter. The system administrator must track congestion, usage, and traffic levels to aid with provisioning decisions. Some performance factors include the following:

- SCP availability
- SCP and database availability
- level of toll-free number services query traffic
- level of SS7 traffic
- SCP query response time

Performance is measured using performance indicators.

5.2.3 Performance indicators

Performance indicators are measurements or records of events that occur during a given period of time or in a time sequence.

Performance indicators show how well toll-free number services software and signaling fulfill the purpose for which they were designed. Performance indicators, such as operational measurements and log reports, measure the following:

- availability
- performance metrics
- error rates

5.2.3.1 Operational measurements

Each SSP counts how many times certain key functions occur, using operational measurements. OMs record events that happen during a given time period, or in a given sequence. They provide information that is used for service level and maintenance indicators, hardware and software assignment, and provisioning decisions. OMs also let you track functional performance levels.

The SSP generates and collects OMs that monitor toll-free number services as part of the ongoing background processes that work in parallel with the other functions of the SSP. Each group serves a specific purpose or describes a specific aspect of service operation.

For further general information about OMs, and complete descriptions of all DMS-100 Family OMs, refer to NTP 297-8003-814, *North American DMS-100 Operational Measurements Reference Manual*.

5.2.3.2 Log reports

SSPs generate log reports to indicate that an event has occurred in the switch or in one of its peripherals. Log reports include status and activity reports, hardware or software fault reports, reports on test results, and reports on other events or conditions. Complete descriptions of all DMS-100 Family log reports are contained in NTP 297-8003-840, *North American DMS-100 Log Reports Reference Manual*. For information on the contents of logs related to 800Plus, refer to Chapter 6, “Maintenance”.

5.2.4 Toll-free number service system resources

The uninterrupted functioning of toll-free number services depends on the operation of the SSPs, STPs, and SCPs that act as sources, transfer points, decision-making databases, and destinations of toll-free number service calls. The critical areas of SSP capacity relate directly to call processing and CCS7 messaging capacities.

5.2.5 Toll-free number services component failures and system faults

Key components on SSPs include the following:

- CCS7 link interface units (LIU7) and associated links
- computing module (CM) and supporting equipment
- input/output cabinet (IOC) equipment

Key components on the SSPs can fail, causing toll-free number service degradation or failure. All hardware failures result in alarms or log reports that

appear at the MAP display. See Table 24 for where to check for alarms and logs.

Table 24 Handling service degradation and system failure

Location of trouble	Where to check for logs and alarms
origination SSP	check locally
destination SSP	check locally
across network	at STP and SSPs

The operation of the SSPs that act as sources and destinations of toll-free number service calls are also crucial to the operation of toll-free number services.

5.3 Using OMs to evaluate toll-free number service performance

This section provides information about the OM groups and registers that are associated with toll-free number services, including basic functions, and lists OM groups and registers.

5.3.1 SSP operational measurements

SSP OM groups help you evaluate the performance and efficiency of your network and toll-free number service. Information is provided on the following OM groups:

- NSC
- NSCACG
- TRMTCM

The following table lists OM groups and individual registers in each group, the release when the register was created, and related registers.

Table 25 lists the registers that are associated with the NSC OM group.

Table 25 NSC OM group registers

Group	Register	Information
NSC		**Description:** Number services code (NSC) provides summary information on NSC calls. NSC calls require access to service control point (SCP) databases. The NSC OM group indicates the grade of service provided by a service switching point (SSP) **Release history:** This group was created in BCS21.The critical areas of SSP capacity relate directly to call processing and CCS7 messaging capacities.

Table 25 NSC OM group registers (continued)

Group	Register	Information
NSC (continued)	NSCABNAS	**Description:** NSC call abandon after seizure (E800 only) is incremented when a disconnect message is received from the calling party after an SSP seizes an outgoing trunk, but before the call is answered. **Release history:** This register was created in BCS21.
	NSCABNBS	**Description:** NSC call abandon before seizure is incremented when a disconnect message is received from the calling party before an SSP seizes an outgoing trunk. **Release history:** This register was created in BCS21.
	NSCATIN	**Description:** NSC access tandem trunk incoming counts NSC calls that are received from other offices (trunk calls) in a Toll/SSP system. This count is only incremented for calls originating from toll trunks, for example, Intertoll, Supercama, and TOPS. **Release history:** This register was created in BCS21.
	NSCDBOVL	**Description:** NSC database overload response is incremented if a database returns the subsystem congestion diagnostic to an SSP, indicating a database overload. **Release history:** This register was created in BCS22.
	NSCEIGHT	**Description:** NSC 800 number returned is incremented when a toll-free number is returned from the SCP database. The number is retranslated using the INWATS tables. **Release history:** This register was created in BCS22.
	NSCFLICM	**Description:** NSC failure invalid command message is incremented when the SSP receives an undecipherable response from the SCP. The call is routed to reorder (RODR) treatment. **Release history:** This register was created in BCS21.
	NSCFLICS	**Description:** NSC failure invalid command sequence is incremented when the SSP receives a response from the SCP that contains incomplete or out-of-sequence commands. The call is routed to reorder (RODR) treatment. **Release history:** This register was created in BCS21.

Table 25 NSC OM group registers (continued)

Group	Register	Information
NSC (continued)	NSCFPRIQ	**Description:** NSC failure prior to query counts calls that fail before a database query is launched, including calls that fail for one of the following reasons: • invalid called number digits • 800Plus subsystem out of service (OOS) • no transaction identifiers (TRIDs) available. **Release history:** This register was created in BCS22.
	NSCINVY	**Description:** NSC invalid special routing OOY code is able to count invalid SRC/00Y codes that are received by the SSP from the end office. An end office may substitute an SRC/00Y code for the 800 code in the 800+NXX+XXXX number to indicate the originating numbering plan area to the SSP. The code is considered invalid if it is not datafilled in table NSCSNPA. The call is routed to vacant code treatment. **Release history:** This register was created in BCS22.
	NSCIVCAR	**Description:** NSC call invalid carrier identification is incremented when the database returns an invalid carrier identification in the response message. A carrier identification is invalid if it is not datafilled in an appropriate data schema table of valid carrier identifications for the number service call service. This register is used by the Southbound feature for U.S. carriers and other common carriers in Canada. The call is routed to SS7 application failure treatment. **Release history:** This register was created in BCS26.
	NSCNSNPA	**Description:** NSC number of non-subscribed numbering plans area (NPA) responses (NSCNSNPA) is incremented if the database returns out of band (out of zone) as a special routing in the database response. Note: This register is only used by the 800P feature. In an SSP 800Plus office, the NSCNSNPA count is zero. **Release history:** This register was created in BCS22.

Table 25 NSC OM group registers (continued)

Group	Register	Information
NSC (continued)	NSCORIG	**Description:** NSC originated counts NSC calls originated by lines and local trunks that have reached the dialing complete stage. In a DMS-100/200 combined end office and toll office SSP, the count is the total number of NSC calls originated by co-located stations (line calls) plus NSC calls resulting from call redirection. In a DMS-200 toll office or end office SSP, the count is zero. **Release history:** This register was created in BCS21.
	NSCOUTSV	**Description:** NSC out-of-service responses is incremented if a database returns the subsystem failure diagnostic indicating that the database is unavailable. The call is routed to reorder (RODR) treatment. **Release history:** This register was created in BCS22.
	NSCQUERY	**Description:** NSC query counts toll-free database queries that are sent by call processing using the transaction capabilities application part (TCAP). **Release history:** This register was created in BCS22.
	NSCSFLTO	**Description:** NSC signaling failure time-out is incremented when a reply is not sent back to the SSP from the SCP within the time interval specified in table NSCDEFS. The call is routed to reorder treatment. **Release history:** This register was created in BCS21.
	NSCST2TO	**Description:** NSC T2 time-out is incremented when the SSP sends a query to the SCP but does not receive a response message from the SCP database within the T2 time interval specified in table NSCDEFS. Note: The T2 time interval is an optional parameter in table NSCDEFS. **Release history:** This register was created in BCS26.
	NSCTIOVF	**Description:** NSC transaction identifier (TRID) unavailable before initial query is incremented when an SSP NSC call fails because the NSC transaction identification is not available in the SSP. The call is routed to reorder (RODR) treatment. **Release history:** This register was created in BCS21.
	NSCUNSOR	**Description:** NSC unsolicited responses (NSCUNSOR) counts unsolicited responses that are received by an SSP from an SCP. Unsolicited responses from the database do not have a corresponding query. **Release history:** This register was created in BCS22.

Table 25 NSC OM group registers (continued)

Group	Register	Information
NSC (continued)	NSCVACDR	**Description:** NSC vacant database responses is incremented if the database response indicates a vacant code. The call is routed to vacant code (VACT) treatment. **Release history:** This register was created in BCS22.

Table 26 lists the registers that are associated with the NSCACG OM group.

Table 26 NSCACG OM group registers

Group	Register	Information
NSCACG		**Description:** Number services code automatic call gapping (NSCACG) provides information on the effectiveness of automatic call gapping (ACG) for number service code (NSC) calls. ACG is the mechanism used to implement network management controls. **Release history:** This group was created in BCS21.
	NSCATMPT	**Description:** NSC attempts (NSCATMPT) counts line and trunk originating 800Plus calls that reach the SSP. **Release history:** This register was created in BCS21.
	NSCBKMCC	**Description:** NSC blocked mass calling controls (NSCBKMCC) counts NSC calls that are blocked by ACG controls for ten-digit mass calling controls. NSC calls blocked for mass calling controls are routed to busy line (BUSY) treatment. **Release history:** This register was created in BCS21.
	NSCBKSIC	**Description:** NSC blocked by Service Management System (SMS)-initiated controls (NSCBKSIC) counts NSC calls that are blocked by automatic call gapping (ACG) controls. The SMS initiates ACGs and forwards them through an SCP to the appropriate service switching point. NSC calls that are blocked by ACG-initiated controls are routed to reorder (RODR) treatment. **Release history:** This register was created in BCS21.
	NSCBKSOC	**Description:** NSC blocked service control point (SCP) overload controls (NSCBKSOC) counts NSC calls that are blocked by ACG controls for SCP overloads. NSC calls blocked by SCP overload controls are routed to generalized no circuit (GNCT) treatment. **Release history:** This register was created in BCS21.

Table 26 NSCACG OM group registers (continued)

Group	Register	Information
	NSCBKVC	**Description:** NSC blocked vacant (VACT) codes (NSCBKVC) counts calls that are blocked by ACG controls that are applied either because tool many calls are made to VACT codes, or because too many calls are made from numbering plan areas (NPA) that have not been purchased for NSCs. **Release history:** This register was created in BCS21.
	NSCCOMC	**Description:** NSC mass calling control list overflow (NSCCOMC) is incremented when an ACG control cannot be applied to a code that is associated with a toll-free number because the control list is full. **Release history:** This register was created in BCS21.
	NSCCONPN	**Description:** NSC non-purchased NPA control list overflow (NSCCONPN) increases when an ACG control on a code is not placed because the control list for calls is full. The calls come from NPAs that are not purchased for NSC use. **Release history:** This register was created in BCS21.
	NSCCOSCP	**Description:** NSC service control point (SCP) control list overflow (NSCCOSCP) increases when a required ACG control, that SCP overloads, is not placed on a code. The SCP overload is not placed on a code because the control list is full. **Release history:** This register was created in BCS21.
	NSCCOSI	**Description:** NSC service management system (SMS)-initiated control list overflow (NSCCOSI) increases when an ACG control that the SMS initiates is not placed on a code because the control list is full. **Release history:** This register was created in BCS21.
	NSCCOSVC	**Description:** NSC six-digit vacant (VACT) code control list overflow (NSCCOSVC) increases when an ACG control is not placed on a VACT six-digit code. The ACG control is not placed on a code because the control list for six-digit codes is full. **Release history:** This register was created in BCS21.
	NSCCOTVC	**Description:** NSC ten-digit vacant (VACT) code control list overflow (NSCCOTVC) increases when an ACG control is not placed on a VACT ten-digit code. An ACG is not placed on a code because the control list for ten-digit codes is full. **Release history:** This register was created in BCS21.

Table 27 lists the registers that are associated with the TRMTCM OM group.

Table 27 TRMTC OM group registers

Group	Register	Information
TRMTCM		**Description:** treatment customer mistakes (TRMTCM) counts calls that are routed to a treatment that is attributed to a customer action, but is not related to authorization. **Release history:** This register was created in BCS20.
	TCMCHAF	**Description:** For originating screening offices with 800Plus service, treatment to CHAF (TCMCHAF) counts calls that are routed to CHAF treatment because the response from the operating company database is Changed 800 Number—Treatment 1. The calling subscriber is routed to national directory assistance. **Release history:** This register was created in BCS22.
	TCMCHAN	**Description:** For originating screening offices with 800Plus service, treatment to CHAN (TCMCHAN) counts calls that are routed to CHAN announcement treatment because the response from the operating company database is Changed 800 Number—Treatment 1. The calling subscriber is routed to an announcement stating that the dialed 800 number has changed and should be checked before redialing. **Release history:** This register was created in BCS22.

5.4 Evaluating toll-free number service performance factors

This section provides a procedure to monitor switch performance.

5.4.1 Creating a performance monitoring plan

Planning and enabling switch-based measurement activities, including defining the performance factors, is usually the joint responsibility of operating company administration, engineering, and maintenance organizations.

5.4.2 Monitoring toll-free number services performance factors

To monitor the performance of toll-free number service on an SSP, do the following.

1 Select the appropriate performance indicators.

2 Activate the performance indicators in the switch and collect the outputs.

Note: To define and activate specific log reports, refer to procedures in the *Input/Output System Reference Manual*. To set up OMs and route OM reports to output devices, refer to procedures in *Basic Administration Procedures*.

3 Analyze the results. Review output associated with the OMs reported in the reporting schedules set up in the previous step by doing the following:

a. Look for service indications that exceed the established engineering criteria for toll-free number services.

b. Look for service indicators, such as log reports, that may indicate a maintenance or datafill problem.

c. Capture the appropriate OM readings that indicate whether more facilities are needed or will be needed to meet engineering criteria.

4 Report the results.

Notify the engineering and maintenance organizations of service indications that require their attention.

Chapter 6: Maintenance

This chapter describes how to carry out maintenance for 800Plus.

- "Overview of maintenance for toll-free number services," on page 119 provides a brief description of toll-free number service maintenance needs.
- "Alarms," on page 119 provides information on how to respond to alarms.
- "Log reports," on page 120 gives a brief description of the log reports that are associated with toll-free number services, and required maintenance responses.
- "Problem detection and trouble clearing," on page 123 provides information about procedures that are used to detect problems with toll-free number services components, and about clearing toll-free number service database problems.
- "Commands," on page 124 gives brief descriptions of some of the maintenance commands that are of particular interest to personnel maintaining toll-free number service.

6.1 Overview of maintenance for toll-free number services

Maintenance for toll-free number service occurs on the service switching points (SSP) that originate and terminate toll-free number calls, and on the SCP that carries the toll-free number services database. Toll-free number services rely on the proper functioning of the whole network.

6.1.1 SSP maintenance

No maintenance is specifically required on SSPs to support toll-free number service. SSPs must be able to process calls, including toll-free number service calls, and must be able to query the SCP for routing information. SSP failures and faults impact all functions provided by the SSP. For further information, refer to *Trouble Locating and Clearing Procedures*.

6.2 Alarms

Toll-free number service only generates one alarm—the Freephone Services Alarm—to indicate that queries to the SCP database have timed-out. Congestion or fault conditions on the network, the SCP, or SSPs can also affect

toll-free number service. These conditions may raise alarms regarding specific SSP or SCP components.

To clear an alarm on the SCCP local subsystem, SSP or SCP, refer to *Alarm and Performance Monitoring Procedures*.

If you fail to find the solution to a fault, or if a procedure instructs you to contact Nortel support services, then do the following:

1 Make a written record of the actions that led up to the problem. Record relevant information such as pertinent logs messages, operational measurements, and any suspect files that have been saved to tape.

2 Categorize the problem by severity according to the guidelines given in Service Priority Classification Description in "Chapter 5: Monitoring toll-free number service".

3 Contact Nortel support services.

You can contact Nortel's technical assistance groups by telephone 24 hours a day. Your sales representative or customer service representatives can supply the telephone numbers for technical assistance.

6.3 Log reports

The system generates and stores system logs to serve as messages whenever a significant event occurs in the switch. For instance, if the machine processes a toll-free number service query, and it detects an error in the data values of one of the tables it accesses, then the system generates a log. The administration personnel use the log messages to locate and correct the condition that causes the error.

6.3.1 Responding to logs

When a log message appears on the printer, look up the message in this section. Take the action indicated for the message.

> ***Note:*** If the message cannot be found in this section, look for it in the *Log Reports Reference Manual*.

6.3.2 Toll-free number services logs

Systems generate the logs described here, under the following conditions:

- toll-free SCP database query delay
- software processing errors
- toll-free number services datafill problems
- changed parameters
- data corruption errors specific to toll-free number service

- operator-handled toll-free number service calls

The logs described here include the following:

- SWER
- NSC100
- CCS

6.3.3 ACG100

6.3.3.1 Seriousness

6.3.3.2 Explanation

6.3.3.3 Action

6.3.3.4 Reference

Refer to the *Log Report Reference Manual*.

6.3.4 ACG300

6.3.4.1 Seriousness

6.3.4.2 Explanation

6.3.4.3 Action

6.3.4.4 Reference

Refer to the *Log Report Reference Manual*.

6.3.5 ACG600

6.3.5.1 Seriousness

6.3.5.2 Explanation

6.3.5.3 Action

6.3.5.4

Refer to the *Log Report Reference Manual*

6.3.6 NSC100

6.3.6.1 Seriousness

This log is not associated with an alarm, but may affect service.

6.3.6.2 Explanation

A received 00Y code cannot be found in table NSCSNPA.

6.3.6.3 Action

Check the datafill in table NSCSNPA.

6.3.6.4 Reference

Refer to the *Log Report Reference Manual*.

6.3.7 CCS250

This log contains a record that the local subsystem entered an alarm state with the Freephone Services alarm.

6.3.7.1 Seriousness

This log is associated with a major alarm, and indicates problems communicating with the SCP database.

6.3.7.2 Explanation

Two queries to the SCP database have timed out after a specified time.

6.3.7.3 Action

Investigate the cause of the communications problems.

6.3.7.4 Reference

Refer to the *Log Report Reference Manual* for log information, and to *Alarm and Performance Monitoring Procedures* to clear the alarm.

> ***Note:*** The following logs appear in the order of alarm resolution. CCS231 records the in service trouble state. CCS220 records the return to the in service state. CCS235 signals that the subsystem is available without errors.

6.3.8 CCS231

This log contains a record that the status of a local subsystem changed to In Service Trouble (ISTB).

6.3.8.1 Seriousness

This log contains a record that the local CCS subsystem has entered the In Service Trouble (ISTb) state.

6.3.8.2 Explanation

Two queries to the SCP database have timed out after a specified time, and generated a CCS LSSM Alarm.

6.3.8.3 Action

Check the MAP subsystem at SCCP LOCAL level of the CCS banner.

6.3.8.4 Reference

Refer to the *Log Report Reference Manual* for log information, and to *Alarm and Performance Monitoring Procedures* to clear the alarm.

6.3.9 CCS220

This log contains a records that the local subsystem has returned to service.

6.3.9.1 Seriousness

This log is not associated with an alarm.

6.3.9.2 Explanation

The local subsystem has returned to the in-service (INSV) state.

6.3.9.3 Action

Check the MAP subsystem at SCCP LOCAL level of the CCS banner

6.3.9.4 Reference

Refer to the *Log Report Reference Manual*.

6.3.10 CCS235

This log contains a record that the local subsystem instance has returned to service.

6.3.10.1 Seriousness

This log is not associated with an alarm.

6.3.10.2 Explanation

The local subsystem is available without errors. This log appears whenever a source of subsystem errors (such as, alarms or IsTb state) has been cleared.

6.3.10.3 Action

No action required.

6.3.10.4 Reference

Refer to the *Log Report Reference Manual*.

6.4 Problem detection and trouble clearing

Use problem detection and trouble clearing procedures to identify and respond to toll-free number service problems that are not associated with SSP alarm conditions. Complete problem detection procedures periodically to diagnose

problems before they become service affecting. Use trouble clearing procedures to respond to problems that you detected through routine diagnostics or through customer reports.

For information on clearing trouble conditions on the SSP, refer to *Trouble Locating and Clearing Procedures*.

6.5 Commands

A number of commands are available to maintenance personnel. Commands that are specific to toll-free number service are listed here. For information on other available commands, refer to the *Commands Reference Manual*.

6.5.1 TESTSS

Use the TESTSS command to test the SCP database without placing an actual call. The TESTSS command verifies that SS7 links are operating and that the toll-free number services database information is valid. You can use the TESTSS command without fully datafilling the switches involved.

Access the TESTSS command from the SCCPLOC level of the MAP display. To reach the SCCPLOC level from the CI level of the MAP display, issue the following command:

```
>MAPCI;MTC;CCS;CCS7;SCCPLOC
```

The format of the TESTSS command is as follows.

```
>TESTSS  800P  cgpa  cdpa  <time-out>
```

where

cgpa	is the originating DN (NPA-NXX-XXXX) used in the query
cdpa	is the terminating DN (NPA-NXX-XXXX) used in the query
<time-out>	is an optional time-out period (default 15 s)

6.5.2 E800VER

Use the E800VER command to verify the validity of SS7 messages that are used by toll-free number services. The E800VER command sends a database query without actually initiating a call.

Note: Perform this command on the switch that makes the query.

The format of the E800VER command for 800Plus is as follows.

```
>E800VER  cgpa  cdpa  <time-out>
```

where

cgpa	is the originating DN (NPA-NXX-XXXX) used in the query

cdpa	is the terminating DN (NPA-NXX-XXXX) used in the query
<time-out>	is an optional time-out period (default 15 s)

6.5.3 TRAVER

Use the TRAVER command to simulate a telephone call in software, and display the line, trunk, or position to which a call is routed, the translation and routing tables that the call accesses, and any additional tables accessed as a result of call screening enhancements. TRAVER verifies that the translation tables for a given call can be properly accessed.

If a call is being incorrectly routed to treatment, or if it is taking the wrong route, then TRAVER helps determine what data to change.

TRAVER can display the following:

- the tables that are used to translate and route a call
- the tables that are accessed for call screening
- each element of the route list with digits outpulsed
- each alternate conditional route

The 800PLUS toll-free number service benefits from two relevant TRAVERS. The first TRAVER focuses on the service from the originator to the 8XX number. The second TRAVER focuses on the service from the originator to the routing number that is returned by the SCP database. These tests can also employ the TESTSS and E800VER commands.

The format of the TRAVER command is as follows.

```
TRAVER origtype origdigits npa rteref
```

where

origtype	is L if a line is the originator is TR if an incoming trunk is the originator is C if an attendant console is the originator is V if a virtual facility group is the originator is R if a routing table is the originator
origdigits	is the originating DN, when origtype is L is the trunk CLLI, when origtype is TR is the name of the console, when origtype is C is the virtual facility group number, when origtype is V is the routing table, when origtype is R
npa	is the numbering plan area code or translator name, when origtype is R
rteref	is the route reference sub-table key, when origtype is R

Note: For examples of relevant TRAVERs, please refer to Appendix A, “Example TRAVER outputs”.

6.5.4 ACG800

An SSP may have to reduce the number of queries that are sent to the SCP database, at the request of the SCP. The request from the SCP comes in the form of an automatic call gapping (ACG) message. The SSP provides the ACG service for either 6 or 10-digit number service code (NSC) calls.

The ACG800 command is used to query which 800PLUS NSC types are under ACG control.

ACG800 can display the following for 6 or 10-digit entries:

- the toll-free code that is used
- the call prefix
- the termination cause to use if no answer is received
- the ACG duration for that toll-free code and call prefix in seconds
- the ACG call gap duration between calls in units of 10 milliseconds
- a message stating that “NO ACG CONTROL IS IN EFFECT”

The format of the ACG command is as follows.

```
ACG DIGNUM {SIX_DIGIT | TEN_DIGIT | ALL}
```

where
SIX_DIGIT
is the DIGNUM setting to query ACG settings for six-digit calls

TEN_DIGIT
is the DIGNUM setting to query ACG settings for ten-digit calls

ALL
is the DIGNUM setting to query ACG settings for all calls

6.5.4.1 Example of ACG800 command

Figure 30 Example of ACG800 command

```
ACG800 ALL
response
ACG is enabled
ACG control for 6-digit codes:

800 code   cause          duration     gap
-----------------------------------------------------------
800 221    mass_calling   128          10
800 226    vacant_code    128          10

ACG control for 10-digit codes:

800 code          cause          duration     gap
-----------------------------------------------------------
800 221 1234      mass_calling   128          10
800 765 1111      vacant_code    128          10

ACG duration unit:     secs
ACG gap      unit: 10 msecs
```

6.5.5 ACGCTRL

The ACGCTRL command is used to modify or view the current ACG status.

Access the ACGCTRL command from the CI level of the MAP display.

The following are valid actions for the ACGCTRL command:

- Enable- enables ACG
- Disable- disables ACG
- Query- view ACG status

6.5.5.1 Example of ACGCTRL command

Figure 31 Example of ACGCTRL command

```
>ACGCTRL
Next par is: <Action> {ENABLE, DISABLE, QUERY}
Enter: <Action>
>disable
ACG IS DISABLED
```

Appendix A: Example TRAVER outputs

This section includes TRAVER outputs, SCP query responses, and datafill.

Note: TRAVER examples for the second leg of the call are for reference only. TRAVER does not support the second leg of the call because translations for that leg are not always the same between TRAVER and the DMS switch. The DMS switch recognizes that the routing number corresponds to an 800 or a direct-dialed call. TRAVER does not make this recognition.

TRAVER uses the line or trunk, and the called number for the first leg of the call. Operating companies can obtain the routing number from the E800VER command and use the routing number for the second leg of the call.

TRAVER outputs apply to the following typical toll-free call scenarios:

1 A call from a toll office service switching point (SSP)

2 A call with Automatic Call Gapping (ACG) from a toll office SSP

3 A call with Overflow Call Routing (OCR) from a toll office SSP

4 An international call from a toll office SSP

5 A Southbound call from a toll office SSP

6 A Northbound call from outside a customer network

7 A call to an End Office Display (EOD) subscriber

8 An ambiguous 8XX call from a toll office SSP

For a high level understanding of these scenarios, refer to Chapter 1: “Understanding toll-free number service”

Note: TOPS SSP does not support TRAVER processing.

A.1 Scenario 1—Call from a toll office SSP

The following TRAVER outputs apply to standard toll-free calls.

A.1.1 TRAVER from end-office trunk to toll office SSP

The following TRAVER output traces a call from its origin over a trunk to a toll office SSP.

Figure 32 TRAVER from end-office trunk to SSP

```
traver tr isupitic 8006221231 b
TABLE TRKGRP
ISUPITIC IT 63 ITTD NCRT IC NIL MIDL 613 PUB NSCR 613 000 N Y $
TABLE STDPRTCT
PUB ( 1) (65021) 3
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . 800 800 N DD 0 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
613 Y 930 20 ( 29) ( 1) ( 0) ( 0) 0
 . SUBTABLE HNPACODE
 . 800 800 NSC 800P
+++ 800P CALL WILL QUERY SCP DATABASE FOR TRANSLATION INFORMATION
TRAVER NOT AVAILABLE

+++ TRAVER: SUCCESSFUL CALL TRACE +++


+++ TRAVER: SUCCESSFUL CALL TRACE +++

>
```

A.1.2 SCP response to toll office SSP query

The following E800VER command output traces a toll office SSP that receives a call and launches a database query.

Figure 33 SCP response

```
>e800ver 6136218945 8006221231

THE RESPONSE FROM THE DATABASE TOOK
0 MINUTES, 0 SECONDS, 10 MILLISECONDS
 COMPONENT 0 INFORMATION:
THE FOLLOWING NUMBER IS THE CARRIER NUMBER
THE NUMBER IS 000
THE FOLLOWING NUMBER IS THE ROUTING NUMBER
THE NUMBER IS 6137098921
THE FOLLOWING NUMBER IS THE BILLING NUMBER
THE NUMBER IS 100

>
```

A.1.3 TRAVER at toll office SSP

The following TRAVER output traces call completion at a toll office SSP.

Figure 34 TRAVER to call completion

```
>traver tr isupitic 6137098921 b
TABLE TRKGRP
ISUPITIC IT 63 ITTD NCRT IC NIL MIDL 613 PUB NSCR 613 000 N Y $
TABLE STDPRTCT
PUB ( 1) (65021) 3
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . 61370 61370 N DD 3 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
613 Y 930 20 ( 29) ( 1) ( 0) ( 0) 0
 . SUBTABLE HNPACODE
 . 709 709 LRTE 23
 . SUBTABLE RTEREF
 .  23 N D ISUPITOG 3 621 N
 . EXIT TABLE RTEREF
EXIT TABLE HNPACONT

+++ TRAVER: SUCCESSFUL CALL TRACE +++

DIGIT TRANSLATION ROUTES

1 ISUPITOG              6218921            ST

TREATMENT ROUTES. TREATMENT IS: GNCT
1 T120

+++ TRAVER: SUCCESSFUL CALL TRACE +++

>
```

A.2 Scenario 2—Call with Automatic Call Gapping from a toll office SSP

The following TRAVER outputs apply to the gapping of calls. Gapping calls reduces SCP traffic.

A.2.1 TRAVER from trunk to toll office SSP (returns ACG component)

The following TRAVER output traces a call where,
a call that reaches an SSP from a trunk invokes ACG settings.

Figure 35 ACG initiation TRAVER

```
>traver tr MF800ITIC 8007004444 b
TABLE TRKGRP
MF800ITIC IT 63 ITTD NCTC IC NIL MIDL 613 PUB NSCR 613 000 N Y $
TABLE STDPRTCT
PUB ( 1) (65021) 3
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . 800 800 N DD 0 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
613 Y 930 20 ( 29) ( 1) ( 0) ( 0) 0
 . SUBTABLE HNPACODE
 . 800 800 NSC 800P
+++ 800P CALL WILL QUERY SCP DATABASE FOR TRANSLATION INFORMATION
TRAVER NOT AVAILABLE

+++ TRAVER: SUCCESSFUL CALL TRACE +++

+++ TRAVER: SUCCESSFUL CALL TRACE +++

>
```

A.2.2 SCP response to toll office SSP query

The following E800VER command output traces a call where, an SCP sends ACG parameters as a result of a query.

Note: ACG was not initiated.

Figure 36 Database response to query

```
>e800ver 6136218945 8007004444
 THE RESPONSE FROM THE DATABASE TOOK
0 MINUTES, 0 SECONDS, 10 MILLISECONDS
 COMPONENT 0 INFORMATION:
THE FOLLOWING NUMBER IS THE CARRIER NUMBER
THE NUMBER IS 000
THE FOLLOWING NUMBER IS THE ROUTING NUMBER
THE NUMBER IS 6137098946
THE FOLLOWING NUMBER IS THE BILLING NUMBER
THE NUMBER IS 100
 COMPONENT 1 INFORMATION:
 THE FOLLOWING IS CALL GAPPING INFORMATION
THE FOLLOWING NUMBER IS THE DIALED NUMBER OR ACG RANGE
THE NUMBER IS 8007004444
ACG IS DUE TO: MASS CALLING OF DESTINATION
ACG SHOULD BE INITIATED FOR 64 SECONDS
ACG SHOULD HAVE A GAP LENGTH OF 60 SECONDS

>
```

A.3 Scenario 3—Call with Overflow Call Routing from a toll office SSP

The following TRAVER outputs apply to calls that can route from one to four DNs. This choice of routing ensures a response from the terminating party.

A.3.1 TRAVER from trunk to toll office SSP

The following TRAVER output traces a leg of the call as a standard call, because OCR was invoked after translations.

Figure 37 OCR call initiation

```
>traver tr MF800ITIC 8006221233
TABLE TRKGRP
MF800ITIC IT 63 ITTD NCTC IC NIL MIDL 613 PUB NSCR 613 000 N Y $
TABLE STDPRTCT
PUB ( 1) (65021) 3
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . 800 800 N DD 0 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
613 Y 930 20 ( 29) ( 1) ( 0) ( 0) 0
 . SUBTABLE HNPACODE
 . 800 800 NSC 800P
+++ 800P CALL WILL QUERY SCP DATABASE FOR TRANSLATION INFORMATION
TRAVER NOT AVAILABLE

+++ TRAVER: SUCCESSFUL CALL TRACE +++

+++ TRAVER: SUCCESSFUL CALL TRACE +++

>
```

A.3.2 SCP response to toll office SSP query

The following E800VER command output traces a call where, an SCP responds to a toll office SSP query with OCR DNs.

Figure 38 SCP responses

```
>e800ver 6136218945 8006221233
THE RESPONSE FROM THE DATABASE TOOK
0 MINUTES, 0 SECONDS, 10 MILLISECONDS
COMPONENT 0 INFORMATION:
THE FOLLOWING NUMBER IS THE CARRIER NUMBER
THE NUMBER IS 000
THE FOLLOWING NUMBER IS THE ROUTING NUMBER
THE NUMBER IS 6137098921
THE FOLLOWING NUMBER IS THE BILLING NUMBER
THE NUMBER IS 100
 COMPONENT 1 INFORMATION:
THE FOLLOWING NUMBER IS THE CARRIER NUMBER
THE NUMBER IS 000
THE FOLLOWING NUMBER IS THE ROUTING NUMBER
THE NUMBER IS 6137098922
THE FOLLOWING NUMBER IS THE BILLING NUMBER
THE NUMBER IS 101
COMPONENT 2 INFORMATION:
THE FOLLOWING NUMBER IS THE CARRIER NUMBER
THE NUMBER IS 000
THE FOLLOWING NUMBER IS THE ROUTING NUMBER
THE NUMBER IS 6137098923
THE FOLLOWING NUMBER IS THE BILLING NUMBER
THE NUMBER IS 103

>
```

A.3.3 TRAVER at toll office SSP

The following TRAVER output traces a call that routes to OCR numbers.

Figure 39 OCR call completion

```
traver tr MF800ITIC 6137098921 b
TABLE TRKGRP
MF800ITIC IT 63 ITTD NCTC IC NIL MIDL 613 PUB NSCR 613 000 N Y $
TABLE STDPRTCT
PUB ( 1) (65021) 3
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . 61370 61370 N DD 3 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
613 Y 930 20 ( 29) ( 1) ( 0) ( 0) 0
 . SUBTABLE HNPACODE
 . 709 709 LRTE 23
 . SUBTABLE RTEREF
 .  23 N D ISUPITOG 3 621 N
 . EXIT TABLE RTEREF
EXIT TABLE HNPACONT
LNP00100 SOC Option is IDLE.
LNP Info: Called DN is not resident.
LNP Info: HNPA results are used.
AIN Info Collected TDP: no subscribed trigger.
TABLE FNPA7DIG
EMPTY TABLE: TUPLE NOT FOUND
Checking AIN SDS Trigger Items as SDS is compatible with current call
AIN Info Analyzed TDP: trigger criteria not met.

DIGIT TRANSLATION ROUTES

1 ISUPITOG              6218921            ST

TREATMENT ROUTES.  TREATMENT IS: GNCT
1 T120

+++ TRAVER: SUCCESSFUL CALL TRACE +++
```

Note: The two other routes of the OCR call differ in the last four digits, that is, 6218922, 6218923.

A.4 Scenario 4—International call from a toll office SSP

The following TRAVER outputs apply to international calls. International calls require an international carrier and a country code.

A.4.1 TRAVER from trunk to toll office SSP

The following TRAVER output traces a call where, a part of a call was standard 800Plus processing.

Figure 40 International call origination

```
>traver tr isupitic 8002261098 b
TABLE TRKGRP
ISUPITIC IT 63 ITTD NCRT IC NIL MIDL 613 PUB NSCR 613 000 N Y $
TABLE STDPRTCT
PUB ( 1) (65021) 3
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . 800 800 N DD 0 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
 . SUBTABLE HNPACODE
+++ 800P CALL WILL QUERY SCP DATABASE FOR TRANSLATION INFORMATION
TRAVER NOT AVAILABLE

+++ TRAVER: SUCCESSFUL CALL TRACE +++


 +++ TRAVER: SUCCESSFUL CALL TRACE +++

>
```

A.4.2 SCP response to toll office SSP query

The following E800VER command output traces a call where, an SCP determined that a call was an international call.

Figure 41 SCP routing of call

```
>e800ver 6136218945 8002261098
THE RESPONSE FROM THE DATABASE TOOK
0 MINUTES, 0 SECONDS, 0 MILLISECONDS
COMPONENT 0 INFORMATION:
THE FOLLOWING NUMBER IS THE CARRIER NUMBER
THE NUMBER IS 000
THE FOLLOWING NUMBER IS AN INTERNATIONAL ROUTING NUMBER
THE NUMBER IS 4216218948
THE FOLLOWING NUMBER IS THE BILLING NUMBER
THE NUMBER IS 100

>
```

A.4.3 TRAVER at toll office SSP

The following TRAVER output traces a call where, an SSP routed a call to an international gateway.

Figure 42 Completion of international call

```
>traver tr isupitic 0114216218948 b
TABLE TRKGRP
ISUPITIC IT 63 ITTD NCRT IC NIL MIDL 613 PUB NSCR 613 000 N Y $
TABLE STDPRTCT
PUB ( 1) (65021) 3
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . 011 011 N DD 3 IN
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE CCTR
421 T 044 8 15 T OFRT 421 Y
TABLE OFRT
 421 N D ISUPITOG 3 N N
EXIT TABLE OFRT
+++ TRAVER: SUCCESSFUL CALL TRACE +++
DIGIT TRANSLATION ROUTES
1 ISUPITOG              6136218948           ST
TREATMENT ROUTES. TREATMENT IS: GNCT
1 T120
+++ TRAVER: SUCCESSFUL CALL TRACE +++

>
```

A.5 Scenario 5—Southbound call from toll office SSP

In the United States (U.S.), Southbound calls translate parameters for E800. These calls supply carrier information for both the U.S., and routes that involve other customer networks.

A.5.1 TRAVER from trunk to toll office SSP

The following TRAVER output traces a leg of a call that sets up an 800Plus database query.

Figure 43 Directory query for a Southbound call

```
traver tr isupitic 8008110026 b
TABLE TRKGRP
ISUPITIC IT 63 ITTD NCRT IC NIL MIDL 613 PUB NSCR 613 000 N Y $
TABLE STDPRTCT
PUB ( 1) (65021) 3
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . 800 800 N DD 0 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
613 Y 930 20 ( 29) ( 1) ( 0) ( 0) 0
 . SUBTABLE HNPACODE
 . 800 800 NSC 800P
+++ 800P CALL WILL QUERY SCP DATABASE FOR TRANSLATION INFORMATION
TRAVER NOT AVAILABLE
+++ TRAVER: SUCCESSFUL CALL TRACE +++
 +++ TRAVER: SUCCESSFUL CALL TRACE +++

>
```

A.5.2 SCP response to toll office SSP query

The following E800VER command output traces a call where, an SCP determined that a call must route to a U.S. gateway.

Figure 44 Southbound message from SCP

```
>e800ver 6136218945 8008110026
THE RESPONSE FROM THE DATABASE TOOK
0 MINUTES, 0 SECONDS, 0 MILLISECONDS
COMPONENT 0 INFORMATION:
THE FOLLOWING NUMBER IS THE CARRIER NUMBER
THE NUMBER IS 200
THE FOLLOWING NUMBER IS THE ROUTING NUMBER
THE NUMBER IS 8005555555
THE FOLLOWING NUMBER IS THE BILLING NUMBER
THE NUMBER IS 134
CALL WOULD BE ROUTED TO US ASSIGNED NUMBER SPECIAL ROUTE

>
```

A.5.3 TRAVER at toll office SSP

The following TRAVER output traces a call where,
from an SCP response, a Canadian Gateway SSP performs the following steps before sending an 800Plus call to outside a customer network:

1 The SSP builds

a. a CHG parameter

b. a CPN parameter

c. an OLI parameter

2 Billing sends a record, because there is no impact on billing.

The SSP places a record and parameters in an IAM and sends this information over a modified TR317 trunk (TR317MOD).

Figure 45 Completion of Southbound call

```
>traver tr isupitic 0992008005555555 b
TABLE TRKGRP
ISUPITIC IT 63 ITTD NCRT IC NIL MIDL 613 PUB NSCR 613 000 N Y $
TABLE STDPRTCT
PUB ( 1) (65021) 3
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . 099200 099200 T NP 6 OFRT 200 16 16 NONE
 . . TABLE OFRT
 . . 200 N D ISUPITOG 0 N N
 . . EXIT TABLE OFRT
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N

+++ TRAVER: SUCCESSFUL CALL TRACE +++

 DIGIT TRANSLATION ROUTES
1 ISUPITOG              8005555555         ST

TREATMENT ROUTES. TREATMENT IS: GNCT
1 T120

+++ TRAVER: SUCCESSFUL CALL TRACE +++

>
```

A.6 Scenario 6—Northbound call from outside customer network

The following TRAVER outputs apply to Northbound calls that, reverse U.S. E800 to 800Plus parameters and record the carrier for billing purposes.

A.6.1 TRAVER from trunk to toll office SSP

The following TRAVER output traces a leg of a call where, a call comes from the U.S., but can also come from another customer network.

Figure 46 Northbound call initiation

```
>traver tr isupitic 8006221231 b
TABLE TRKGRP
ISUPITIC IT 63 ITTD NCRT IC NIL MIDL 613 EAP4 NSCR 613 000 N Y (CHGNUM ) $
TABLE STDPRTCT
EAP4 ( 1) (65021) 2
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . 800 800 N DD 0 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
613 Y 930 20 ( 29) ( 1) ( 0) ( 0) 0
 . SUBTABLE HNPACODE
 . 800 800 NSC 800P
+++ 800P CALL WILL QUERY SCP DATABASE FOR TRANSLATION INFORMATION
TRAVER NOT AVAILABLE
+++ TRAVER: SUCCESSFUL CALL TRACE +++

+++ TRAVER: SUCCESSFUL CALL TRACE +++

>
```

A.6.2 SCP response to toll office SSP query

The following E800VER command output traces a call where, a U.S. gateway SSP sends a query, receives a response, and proceeds with normal routing.

Figure 47 SCP response to final Northbound leg of call

```
>e800ver 6136218945 8006221231

THE RESPONSE FROM THE DATABASE TOOK
0 MINUTES, 0 SECONDS, 150 MILLISECONDS
COMPONENT 0 INFORMATION:
THE FOLLOWING NUMBER IS THE CARRIER NUMBER
THE NUMBER IS 000
THE FOLLOWING NUMBER IS THE ROUTING NUMBER
THE NUMBER IS 6136218921
THE FOLLOWING NUMBER IS THE BILLING NUMBER
THE NUMBER IS 100

>
```

A.6.3 TRAVER for final leg of call

The following TRAVER output traces a leg of a call that routes a call to a DN inside a Canadian network.

Figure 48 Northbound call completion

```
>traver tr isupitic 6137098921 b
TABLE TRKGRP
ISUPITIC IT 63 ITTD NCRT IC NIL MIDL 613 PUB NSCR 613 000 N Y $
TABLE STDPRTCT
PUB ( 1) (65021) 3
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . 61370 61370 N DD 3 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
613 Y 930 20 ( 29) ( 1) ( 0) ( 0) 0
 . SUBTABLE HNPACODE
 . 709 709 LRTE 23
 . SUBTABLE RTEREF
 .  23 N D ISUPITOG 3 621 N
 . EXIT TABLE RTEREF
EXIT TABLE HNPACONT

+++ TRAVER: SUCCESSFUL CALL TRACE +++

DIGIT TRANSLATION ROUTES

1 ISUPITOG              6218921            ST

TREATMENT ROUTES. TREATMENT IS: GNCT
1 T120

+++ TRAVER: SUCCESSFUL CALL TRACE +++

>
```

A.7 Scenario 7—Call to End Office Display subscriber

The following TRAVER outputs apply to calls that display calling information on a phone set of a subscriber.

A.7.1 TRAVER from trunk to toll office SSP

The following TRAVER output traces a leg of a call as standard 800Plus.

Figure 49 EOD call origination

```
>traver tr isupitic 8006221231 b
TABLE TRKGRP
ISUPITIC IT 63 ITTD NCRT IC NIL MIDL 613 PUB NSCR 613 000 N Y $
TABLE STDPRTCT
PUB ( 1) (65021) 3
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . 800 800 N DD 0 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
613 Y 930 20 ( 29) ( 1) ( 0) ( 0) 0
 . SUBTABLE HNPACODE
 . 800 800 NSC 800P
+++ 800P CALL WILL QUERY SCP DATABASE FOR TRANSLATION INFORMATION
TRAVER NOT AVAILABLE

+++ TRAVER: SUCCESSFUL CALL TRACE +++
+++ TRAVER: SUCCESSFUL CALL TRACE +++

>
```

A.7.2 SCP response to toll office SSP query

The following E800VER command TRAVER output traces a call where, an SCP response contains information on an EOD subscription.

The following parameters are specific to EOD:

- DIALLED NUMBER IDENTIFICATION (NTS_DNID)
- CALLING NUMBER DELIVERY (NTS_CID)

Figure 50 SCP response to EOD call

```
>e800ver 6136218945 8006221231
THE RESPONSE FROM THE DATABASE TOOK
0 MINUTES, 0 SECONDS, 10 MILLISECONDS
COMPONENT 0 INFORMATION:
THE FOLLOWING NUMBER IS THE CARRIER NUMBER
THE NUMBER IS 000
THE FOLLOWING NUMBER IS THE ROUTING NUMBER
THE NUMBER IS 6136218921
THE FOLLOWING NUMBER IS THE BILLING NUMBER
THE NUMBER IS 100
FEATURE TYPE INDICATOR PARAMETER INFORMATION:
FEATURES SUBSCRIBED ON THIS CALL:
DIALLED NUMBER IDENTIFICATION
CALLING NUMBER DELIVERY
FEATURES ACTIVE ON THIS CALL:
DIALLED NUMBER IDENTIFICATION
CALLING NUMBER DELIVERY
FEATURES INTERPRETED BY THE SSP:
DIALLED NUMBER IDENTIFICATION
CALLING NUMBER DELIVERY

>
```

A.7.3 TRAVER at toll office SSP to end office

The following TRAVER output traces a leg of a call that forwards a call to an end office.

Figure 51 EOD call completion

```
traver tr isupitic 6137098921 b
TABLE TRKGRP
ISUPITIC IT 63 ITTD NCRT IC NIL MIDL 613 PUB NSCR 613 000 N Y $
TABLE STDPRTCT
PUB ( 1) (65021) 3
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . 61370 61370 N DD 3 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
613 Y 930 20 ( 29) ( 1) ( 0) ( 0) 0
 . SUBTABLE HNPACODE
 . 709 709 LRTE 23
 . SUBTABLE RTEREF
 .  23 N D ISUPITOG 3 621 N
 . EXIT TABLE RTEREF
EXIT TABLE HNPACONT

+++ TRAVER: SUCCESSFUL CALL TRACE +++

DIGIT TRANSLATION ROUTES
1 ISUPITOG              6218921            ST

TREATMENT ROUTES. TREATMENT IS: GNCT
1 T120

+++ TRAVER: SUCCESSFUL CALL TRACE +++

>
```

A.7.4 TRAVER from end office to EOD subscriber

The following TRAVER output traces a final leg of a call that contains display information.

Figure 52 Completion of EOD call

```
>traver tr isupitic 6218921 b
TABLE TRKGRP
ISUPITIC IT 63 ITTD NCRT IC NIL MIDL 613 PUB NSCR 613 000 N N $
TABLE STDPRTCT
PUB ( 1) (65021) 0
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   N NP 0 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
613 Y 998 1 ( 172) ( 1) ( 107) ( 0) 3
 . SUBTABLE HNPACODE
 . 6218 6219 DN 613 621

+++ TRAVER: SUCCESSFUL CALL TRACE +++


DIGIT TRANSLATION ROUTES

1 LINE                  6136218025         ST

 TREATMENT ROUTES. TREATMENT IS: GNCT
1 T120

+++ TRAVER: SUCCESSFUL CALL TRACE +++

>
```

A.7.5 Supplemental information

A QDN indicates whether a line subscribes to EOD specific RES options, NTS_CID and NTS_DNID. Only RES lines can subscribe to EOD.

The following result of a QDN query provides EOD information.

Figure 53 QDN to show EOD display contents

```
>qdn 6218025
DN:     6218025
TYPE: SINGLE PARTY LINE
SNPA: 613   SIG: DP    LNATTIDX:  218
LINE EQUIPMENT NUMBER:     HOST  00 0 03 06
LINE CLASS CODE:      1FR
IBN TYPE: STATION
CUSTGRP:        RESG218     SUBGRP: 0  NCOS: 0
LINE TREATMENT GROUP:     218
CARDCODE:  6X17AC    GND: N  PADGRP: STDLN  BNV: NL MNO: N
PM NODE NUMBER     :    39
PM TERMINAL NUMBER :    103
OPTIONS: NONE
RES OPTIONS:
NTS_CID NTS_DNID CND NOAMA

>
```

A.8 Scenario 8—Ambiguous 8XX call from toll office SSP

The following TRAVER outputs apply to ambiguous calls where, NPAs or NXXs duplicate 8XX SACs.

Note: The Toll-Denied (TDN) call in this scenario is a toll call.

A.8.1 TRAVER from trunk to toll office SSP (8XX Toll Free)

The following TRAVER output traces an ambiguous toll-free call.

Figure 54 Ambiguous toll-free call initiation

```
>traver tr isupitic 8886221231 b
TABLE TRKGRP
ISUPITIC IT 63 ITTD NCRT IC NIL MIDL 613 PUB NSCR 613 000 N Y $
TABLE STDPRTCT
PUB ( 1) (65021) 3
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . 888 888 N DD 0 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
613 Y 930 20 ( 29) ( 1) ( 0) ( 0) 0
 . SUBTABLE HNPACODE
 . 888 888 AMBI TIM DN 613 621 NSC 800P
+++ 800P CALL WILL QUERY SCP DATABASE FOR TRANSLATION INFORMATION
TRAVER NOT AVAILABLE

+++ TRAVER: SUCCESSFUL CALL TRACE +++


+++ TRAVER: SUCCESSFUL CALL TRACE +++

>
```

A.8.2 SCP response to toll office SSP query

The following E800VER command output traces a call where, an SCP handles a call as a normal toll-free call.

Figure 55 SCP response to ambiguous call

```
>e800ver 6136218945   8887004444
THE RESPONSE FROM THE DATABASE TOOK
0 MINUTES, 0 SECONDS, 10 MILLISECONDS
COMPONENT 0 INFORMATION:
THE FOLLOWING NUMBER IS THE CARRIER NUMBER
THE NUMBER IS 000
THE FOLLOWING NUMBER IS THE ROUTING NUMBER
THE NUMBER IS 6137098921
THE FOLLOWING NUMBER IS THE BILLING NUMBER
THE NUMBER IS 100

>
```

A.8.3 TRAVER at toll office SSP

The following TRAVER output traces a call that routes to an 888 toll-free subscriber.

Figure 56 Ambiguous call completion

```
>traver tr isupitic 6137098921 b
TABLE TRKGRP
ISUPITIC IT 63 ITTD NCRT IC NIL MIDL 613 PUB NSCR 613 000 N Y $
TABLE STDPRTCT
PUB ( 1) (65021) 3
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . 61370 61370 N DD 3 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
613 Y 930 20 ( 29) ( 1) ( 0) ( 0) 0
 . SUBTABLE HNPACODE
 . 709 709 LRTE 23
 . SUBTABLE RTEREF
 .  23 N D ISUPITOG 3 621 N
 . EXIT TABLE RTEREF
EXIT TABLE HNPACONT
+++ TRAVER: SUCCESSFUL CALL TRACE +++

DIGIT TRANSLATION ROUTES
1 ISUPITOG              6218921            ST

TREATMENT ROUTES. TREATMENT IS: GNCT

1 T120

+++ TRAVER: SUCCESSFUL CALL TRACE +++

>
```

A.8.4 Ambiguous 8XX toll call from line with TDND

The following TRAVER output traces a call where toll charges are determined.

Figure 57 Billing for TDND call

```
>traver l 9631001 8881001 b
TABLE LINEATTR
402 1FR NONE NT NSCR 0 613 PUB L613 TSPS 10 NIL NILSFC LATA1 0 NIL NIL 00
N $
TABLE STDPRTCT
PUB ( 1) (65021) 1
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
DOCUMENTATION.
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   N NP 0 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
613 Y 772 1 ( 91) ( 1) ( 0) ( 0) 3
 . SUBTABLE HNPACODE
 . 888 888 AMBI TIM DN 613 621 NSC E800
TABLE LCASCRCN
613 L613 ( 26) OPTL N N
 . SUBTABLE LCASCR
 . TUPLE NOT FOUND. DEFAULT IS NON-LOCAL
TABLE PFXTREAT
OPTL NP N DD UNDT

+++ TRAVER: SUCCESSFUL CALL TRACE +++



TREATMENT ROUTES. TREATMENT IS: TDND
1 *OFLO
2 LKOUT

+++ TRAVER: SUCCESSFUL CALL TRACE +++

>
```

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