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DMS-100 Family

Network Facility Access (NFA)

Product Information, Engineering and Translations Guide

BCS36 and up Standard 01.01 November 1994

northern telecom

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BCS36 Standard 01.01 first release of this document.

Contents

List of figures

List of tables

About this document

This document is divided into three main sections: "Product Information," "Engineering," and "Translations." "Product Information" provides an overview of the Network Facility Access (NFA) software and its implementation within network configurations. "Engineering" provides information for planning and assessing engineering requirements for NFA software feature packages. It also contains information for determining the data store and program store requirements for implementation on DMS SuperNode family equipment. "Translations" identifies the tasks required to datafill the NFA product from the DMS switch and provides the information required to complete those tasks.

When to use this document

Northern Telecom (NT) software releases are referred to as batch change supplements (BCS) and are identified by a number, for example, BCS29. This document is written for DMS-100 Family offices that have BCS36 and up.

More than one version of this document may exist. The version and issue are indicated throughout the document, for example, 01.01. The first two digits increase by one each time the document content is changed to support new BCS-related developments. For example, the first release of a document is 01.01, and the next release of the document in a subsequent BCS is 02.01. The second two digits increase by one each time a document is revised and rereleased for the same BCS.

To determine which version of this document applies to the BCS in your office, check the release information in *DMS-100 Family Guide to Northern Telecom Publications*, 297-1001-001.

How to identify the software in your office

The *Office Feature Record (D190)* identifies the current BCS level and the NT feature packages in your switch. You can list a specific feature package or patch on the MAP (maintenance and administration position) terminal by typing

>PATCHER; INFORM LIST identifier

and pressing the Enter key.

where
identifier is the number of the feature package or patch ID

You can identify your current BCS level and print a list of all the feature packages and patches in your switch by performing the following steps. First, direct the terminal response to the desired printer by typing

>SEND printer_id

and pressing the Enter key.

where
printer_id is the number of the printer where you want to print the data

Then, print the desired information by typing

>PATCHER;INFORM LIST;LEAVE

and pressing the Enter key.

Finally, redirect the display back to the terminal by typing

>SEND PREVIOUS

and pressing the Enter key.

How Network Facility Access documentation is organized

This document is part of Network Facility Access documentation that supports the Northern Telecom line of Network Facility Access products. Network Facility Access documentation is a subset of the DMS-100 Family library.

The DMS-100 Family library is structured in numbered layers, and each layer is associated with an NT product. To understand Network Facility Access products, you need documents from the following layers:

- Network Facility Access documents in the 297-5151 layer
- DMS-100 basic documents in the 297-1001 layer
- CCS7 documents in the 297-5101 and 297-5161 layers
- Meridian Digital Centrex (MDC) documents in the 297-2001 layer

References in this document

The following documents are referred to in this document.

Number	Title
297-1001-001	*DMS-100 Family Guide to Northern Telecom Publications*
297-1001-300	*Basic Administration Procedures*
297-1001-318	*Service Problem Analysis Administration Guide*
297-1001-362	*Core Translations Translations Guide*
297-1001-450	*DMS-100 Provisioning Manual*
297-1001-451	*Customer Data Schema*
297-1001-454	*Customer Data Schema Input Forms*
297-1001-455	*Office Parameters Reference Manual*
297-1001-527	*Digital Recorded Announcement Machine DRAM and EDRAM Guide*
297-1001-592	*Peripheral Modules Maintenance Guide*
297-1001-801	*Feature Description Manual Reference Manual*
297-1001-805	*Hardware Description Manual Reference Manual*
297-1001-814	*Operational Measurements Reference Manual*
297-1001-820	*Nonmenu Commands Reference Manual*
297-1001-821	*Menu Commands Reference Manual*
297-1001-830	*Bellcore Format Automatic Message Accounting Reference Guide*
297-1001-840	*Log Report Reference Manual*
297-2001-351	*Meridian Digital Centrex Translations Guide*
297-5001-010	*DMS SuperNode Product Guide*
297-5101-301	*DMS SuperNode Signaling Transfer Point Administration Guide*

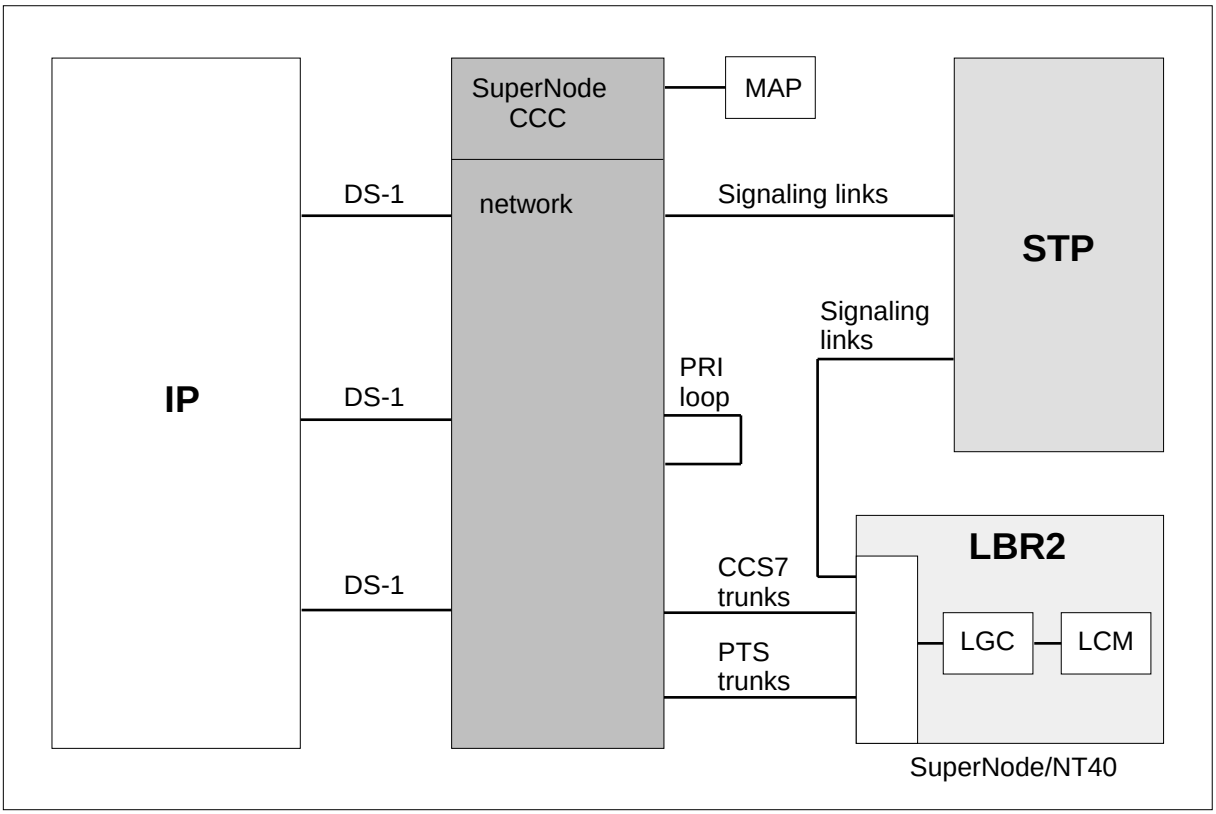
-continued-

Number	**Title** (continued)
297-5101-501	DMS SuperNode Signaling Transfer Point (DMS-STP) Maintenance
297-5121-544	*DMS SuperNode Signaling Point/Service Switching Point Trouble Locating and Clearing Procedures*
297-5151-010	*DMS SuperNode Common Channel Signaling 7 Product Guide*
297-5151-350	*DMS SuperNode Common Channel Signaling 7 Translations Guide*
297-5161-011	*Advanced Intelligent Network Release 0.1 Service Switching Point Product Information, Engineering, and Administration Guide*
297-5161-351	*Advanced Intelligent Network Release 0.1 Service Switching Point Translations Guide*
297-5161-510	*Advanced Intelligent Network Release 0.1 Service Switching Point Complete Maintenance Guide*
100PKT31	*SS7-Transaction Service (TCAP) Support*
End	

Understanding NFA

Network facility access (NFA) provides a direct connection between a subscriber line and an intelligent processor (IP), enabling the subscriber to access services provided directly by the IP. The access to the IP is provided by a DMS-100 or DMS-100/200 switch. See figure 1-1 for a block diagram of the typical NFA configuration.

Figure 1-1xxx
Network facility access configuration



The subscriber is provided access to the IP in two ways: implicit (or auto) and explicit (or dialed).

With implicit access, the NFA user, when going off-hook, is simultaneously connected to a DMS digit receiver card and an NFA trunk going to the IP. The subscriber can speak with the IP, which initiates voice-activated dialing, or can revert to regular call processing by dialing as normal.

With explicit access, the subscriber goes off-hook and dials an NFA explicit access code. The DMS switch processes the access code and establishes an NFA trunk connection to the IP. The subscriber can then either speak with the IP or can enter digits for the IP to interpret. If these digits are dial pulse (DP), they are converted to dual-tone multifrequency (DTMF) digits by the DMS switch before they are relayed to the IP.

Both implicit and explicit access provide the ability for the IP to dial for the subscriber. Any call initiated by the IP dialing is handled as though the subscriber had dialed the digits, including billing. The IP can dial a number capable of being routed, as well as a feature access code, from an implicit or explicit connection.

The IP is connected to the DMS switch over a DS-1 digital trunk. This trunk only supports terminations; call originations from the IP over this trunk are not supported. Standard inband signaling is used over the trunk connection.

Theory of operation

This feature has two main modes of operation, implicit and explicit. In implicit mode, the IP is directly connected to the subscriber's line in parallel with a digit receiver upon every origination. This digit receiver can be a DTMF receiver or a universal tone receiver (UTR). A receiver is used only if the line uses DTMF signaling. DP lines do not require a digit receiver.

In the explicit mode, the subscriber must first dial an access code and is then directly connected to the IP. Any DP digits entered by the subscriber while connected in explicit mode are converted to DTMF digits before being outpulsed to the IP.

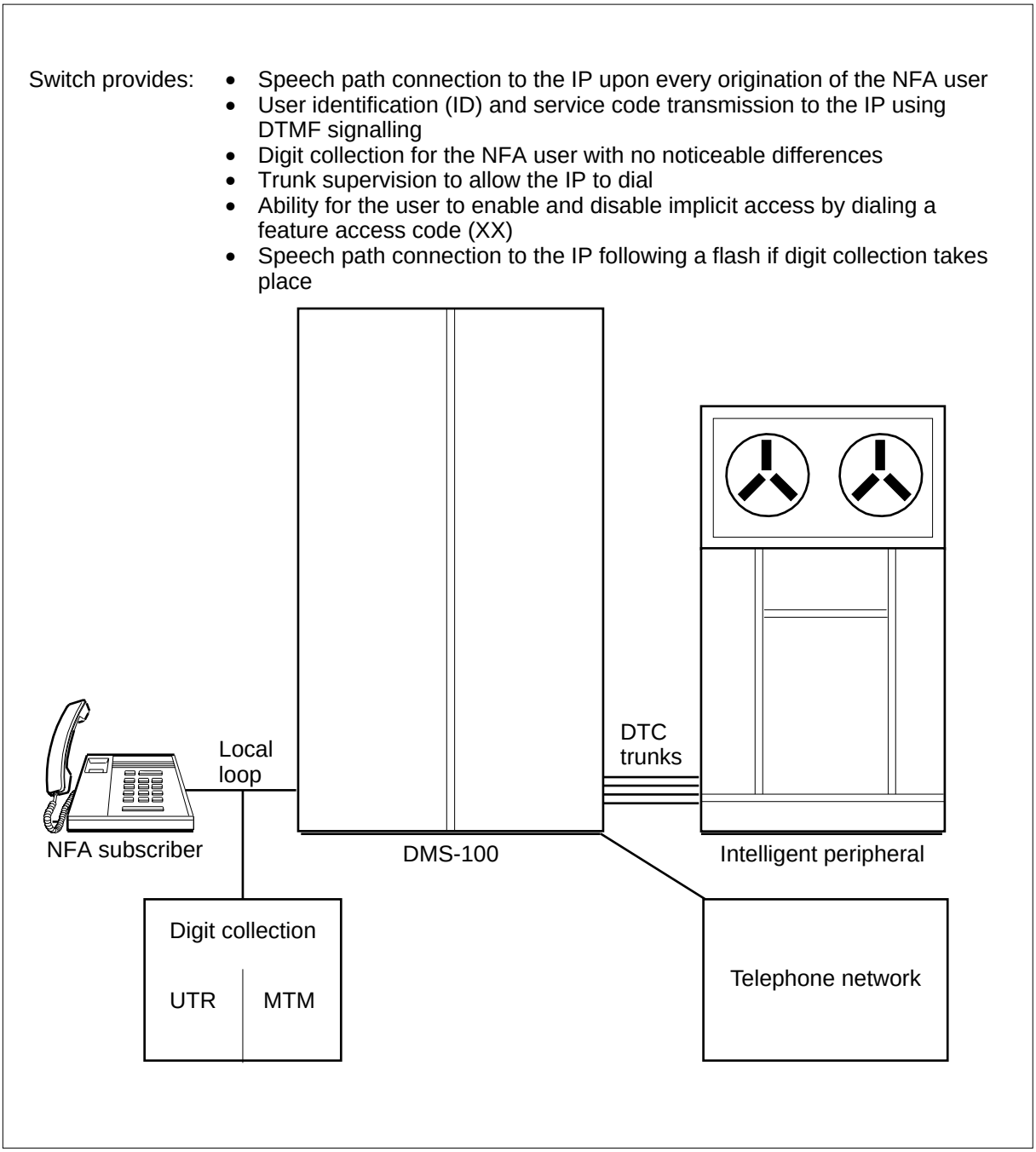
With either implicit or explicit access, the DMS switch provides the capability for the IP to dial a call for the subscriber. If this capability is called for, the subscriber is first placed on hold while the IP dials. After all the digits are received on the NFA trunk from the IP, the trunk connection to the IP is dropped. The subscriber is made active again and the call routes as though the subscriber had dialed the digits.

Implicit mode

With implicit access, the NFA user, upon going off-hook, is simultaneously connected to a DMS receiver card and the IP. The subscriber can interact with the IP or can revert to regular call processing by dialing as normal.

Figure 1-2 provides a diagram of NFA implicit access.

Figure 1-2xxx
NFA implicit access

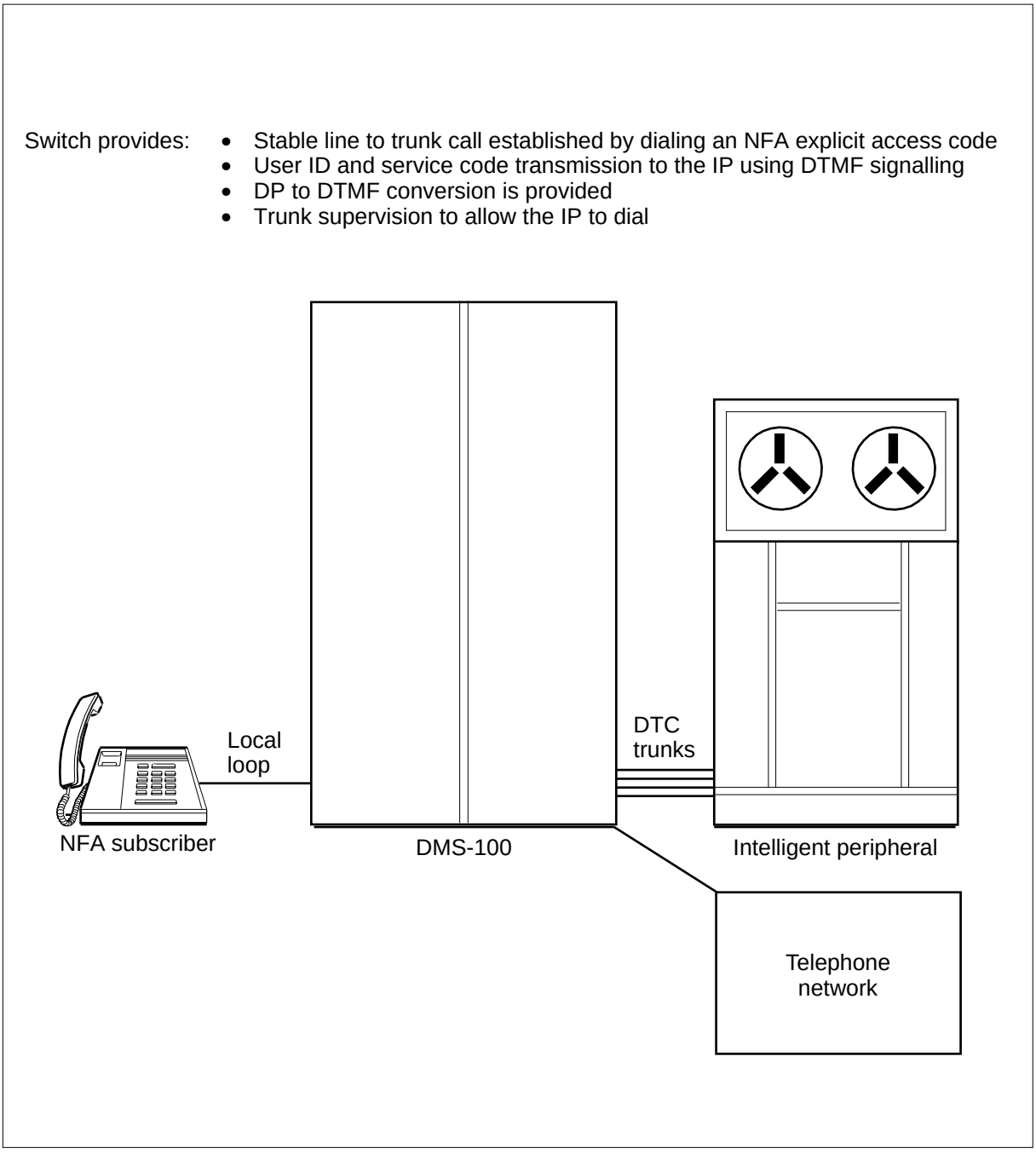


Explicit mode

In the explicit mode, the subscriber must first dial an access code and then is directly connected to the IP. Any DP digits entered by the subscriber, while in the explicit mode, are converted to DTMF digits before being outpulsed to the IP.

Figure 1-3 provides a diagram of NFA explicit access.

Figure 1-3xxx
NFA explicit access



DP to DTMF digit conversion DP to DTMF digit conversion is provided to convert DP digits entered from a subscriber's customer premises equipment (CPE) to DTMF digits before these digits are outpulsed to the IP. Conversion is provided upon every explicit connection, even for a DTMF line, because such a line could still have a DP CPE in use. The possibility that conversion could produce a real time impact on the DMS switch is not eliminated; therefore, measures to control this impact, such as limiting when conversion would occur, may be warranted.

Whether or not a conversion occurs is recorded for use in AMA; that is, whether the subscriber actually enters a DP digit and it is converted to DTMF.

IP dialing

The IP can dial a number for the subscriber during an implicit or an explicit connection. IP dialing is initiated by the IP sending an inverted wink signal to the DMS switch. An inverted wink is defined with the same timing parameters as that of a normal wink, as defined in Bellcore specification TR-TSY-000064, *LATA Switching System Generic Requirements, Issue 2*. However, the state changes are inverted. A normal wink is a state change from on-hook to off-hook and back to on-hook, while an inverted wink is a state change from off-hook to on-hook and back to off-hook.

Once the inverted wink is received by the DMS switch, the subscriber is placed on hold, ending DP to DTMF conversion, and a UTR is attached to the trunk. If no UTR is available, the trunk connection is dropped and the subscriber receives no circuit treatment. Otherwise, an inverted wink signal is outpulsed back to the IP. The IP then sends DTMF digits to the DMS switch. The end-of-digits dialed is specified either by an inter-digital timeout, as specified in the trunk datafill, or by a # digit. Once an end-of-digits indication has been obtained, the trunk connection is dropped, the subscriber is removed from hold, and the call proceeds with the digits that were received as if the subscriber had dialed those digits. If the subscriber goes on-hook while the IP is outpulsing digits to the DMS switch, the trunk is released and any digits received are discarded.

The IP can dial any routable number, such as a DN or a feature access code. This also includes one of the NFA feature access codes. The maximum number of digits that the IP can dial is 24. However, the IP can dial only a single string of digits. The concept of a digit separator, in which the IP would be capable of dialing two separate strings of digits for the subscriber, is not supported for this feature.

Combination of implicit/explicit access

If desired, the office can allow a subscriber line to have both implicit and explicit access. When the subscriber goes off-hook, there is an implicit connection to the IP. When the subscriber dials an explicit access code, the

implicit connection is dropped after the first digit is entered and an explicit connection is established after the digits are translated. Depending on the customer group and translations datafill, these two connections can be over the same or different trunk groups.

It is also possible for the implicit connection to dial an explicit feature access code for the subscriber. As soon as the feature access code digits have been received from the IP on the implicit access, the NFA trunk connection is dropped and the digits are translated. This will establish a second NFA trunk connection for the explicit access.

Planning and engineering network facility access

Hardware provisioning

This feature introduces no special provisioning rules for hardware but is only supported on line trunk controllers (LTCs) or digital trunk controllers (DTCs), not on digital carrier modules (DCMs) and so forth. However, the following items should be noted:

- Because a trunk circuit is seized every time a subscriber with implicit access goes off-hook, trunk usage in the office will increase. The number of trunk circuits provisioned should be increased as the number of subscribers with Network Facility Access (NFA) implicit access is increased.
- Because a universal tone receiver (UTR) is used every time the IP dials a call for the subscriber, the number of UTRs in DTCs or LTCs with NFA trunks needs to be increased. As the number of NFA trunks off a given DTC or LTC is increased, the number of UTRs also needs to be increased.
- NFA trunks are supported with the following DTC exec lineups: DTCEX, FXODTC and DTCFX.

With the addition of office parameter, NFA_IMPLCT_BYPASS_UTR, implemented in BCS35 by feature NC0497 and provided in BCS34 by a patch, the digit collection for all lines which have activated NFA implicit access can be handled by network DTMF receivers instead of by UTRs.

All NFA implicit access traffic is routed to network DTMF receivers for digit collection, decreasing the possibility of talkoff associated with UTR cards. A new office parameter called NFA_IMPLCT_BYPASS_UTR is added to Table OFCENG and is set with a default value of N. If this parameter is set to N during an implicit access connection, digit collection is performed with UTRs, provided the line's peripheral is equipped with them. If the line's peripheral is not equipped with UTRs, network DTMF receivers are used for digit collection.

If this engineering option is used, the office must provision enough network DTMF receivers to handle all of the NFA implicit access traffic.

Datafilling Network Facility Access (NFA) - NTXR25AA

This chapter describes the datafill required to implement Network Facility Access (NFA). Feature package NTXR25AA contains the following features:

- Network Facility Access, NC0418, BCS34
- NFA: Remote Access, Flash Processing, NC0497, BCS35

  Note: Inverted wink, flash handling and universal tone receiver (UTR) override functionality, part of feature NC0497, are capable of being patched back into BCS34 loads.

Feature package prerequisites

Features AR0219 and AR0228 require the following feature packages:

Feature package prerequisites

Feature package	Feature package name
NTX000AA	Bilge
NTX001AA	Common Basic
NTX100AA	Integrated Business Networks - Basic (IBN)
NTX901AA	Local Features I
NTXA64AA	Residential Enhanced Service Base

Note: Currently NFA and AIN R0.1 interaction is unsupported.

Network Facility Access

Feature name

Network Facility Access

Feature number

NC0418

Feature package

Network Facility Access NTXR25AA

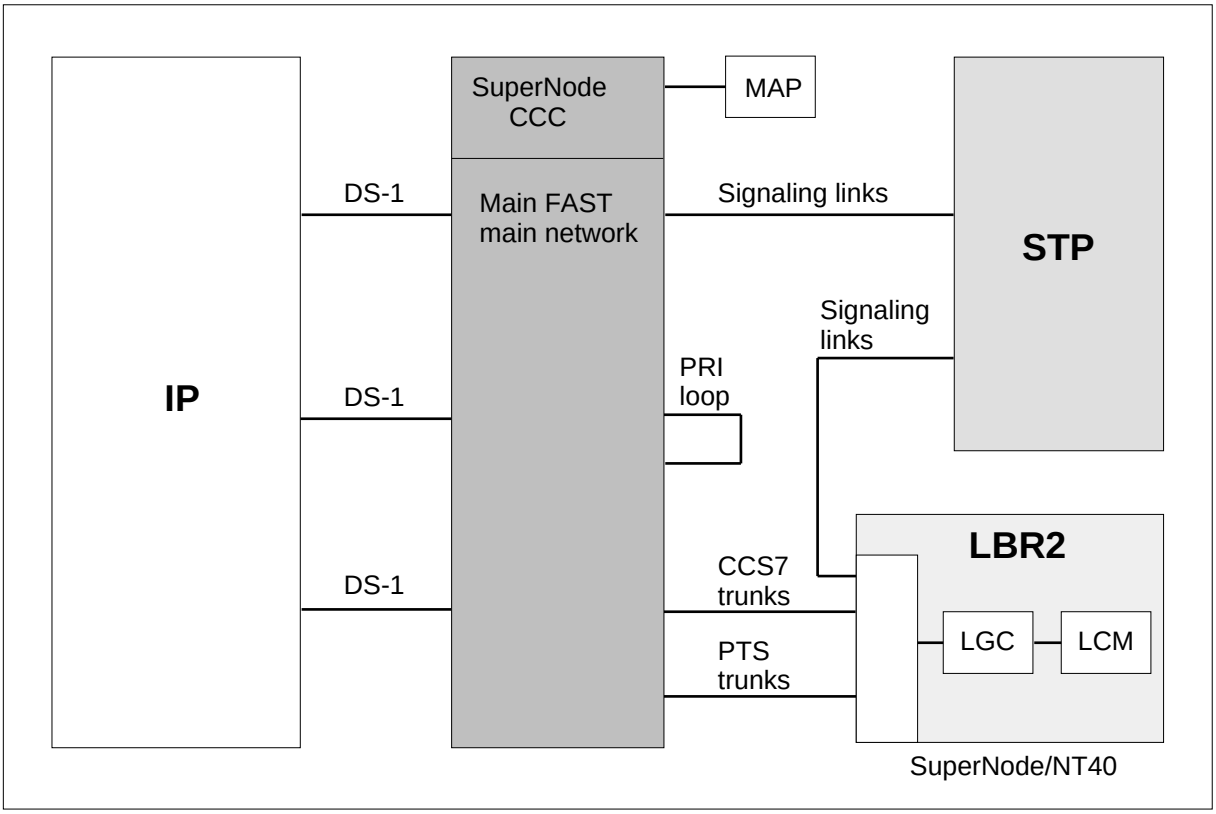
BCS applicability

BCS34 and up

Description

This feature provides network facility access (NFA) or a direct connection between a subscriber line and an intelligent processor (IP), enabling the subscriber to access services provided directly by the IP. The access to the IP is provided by a DMS-100 or DMS-100/200 switch. The actual functionality and programming of the IP is not discussed in this chapter.

Figure 3-1
Network Facility Access configuration



The subscriber is provided access to the IP in two ways: implicit (or auto) and explicit (or dialed).

With implicit access, the NFA user, when going off-hook, is simultaneously connected to a DMS digit receiver card and an NFA trunk going to the IP. The subscriber can speak with the IP, which initiates voice-activated dialing, or can revert to regular call processing by dialing as normal.

With explicit access, the subscriber goes off-hook and dials an NFA explicit access code. The DMS switch processes the access code and establishes an NFA trunk connection to the IP. The subscriber can then either speak with the IP or can enter digits for the IP to interpret. If these digits are dial pulse (DP), they are converted to dual-tone multifrequency (DTMF) digits by the DMS switch before they are relayed to the IP.

Network Facility Access (continued)

Both implicit and explicit access provide the ability for the IP to dial for the subscriber. Any call initiated by the IP dialing is handled as though the subscriber had dialed the digits, including billing. The IP can dial a number capable of being routed, as well as a feature access code, from an implicit or explicit connection.

The IP is connected to the DMS switch over a DS-1 digital trunk. This trunk only supports terminations; call originations from the IP over this trunk are not supported. Standard inband signaling is used over the trunk connection.

Theory of operation

This feature has two main modes of operation, implicit and explicit. In implicit mode, the IP is directly connected to the subscribers line in parallel with a digit receiver upon every origination. This digit receiver can be a DTMF receiver or a UTR. A receiver is used only if the line uses DTMF signaling. DP lines do not require a digit receiver.

In the explicit mode, the subscriber must first dial an access code and is then directly connected to the IP. Any DP digits entered by the subscriber while connected in explicit mode are converted to DTMF digits before being outpulsed to the IP.

With either implicit or explicit access, the DMS switch provides the capability for the IP to dial a call for the subscriber. If this capability is called for, the subscriber is first placed on hold while the IP dials. After all the digits are received on the NFA trunk from the IP, the trunk connection to the IP is dropped. The subscriber is made active again and the call routes as though the subscriber had dialed the digits.

Implicit mode

With implicit access, the NFA user, upon going off-hook, is simultaneously connected to a DMS receiver card and the IP. The subscriber can interact with the IP or can revert to regular call processing by dialing as normal.

Implicit operation

An implicit connection to the IP is initiated every time the subscriber goes off-hook, provided that the NFA option has been added to the subscribers line. The implicit status of a subscriber must be active and is controlled by the subscriber using a feature access code. The feature access code is datafilled in table IBNXLA.

Upon going off-hook, the DMS switch first provides normal dial tone or stuttered dial tone to the subscriber. The subscriber only receives stuttered dial tone if the line has a feature which provides stuttered dial tone and if that feature is active. A receiver off-hook (ROH) timer also is activated. The DMS switch then finds a trunk group over which it can make a connection to the IP. This determination is made from routing information datafilled in the lines customer group data, table CUSTSTN.

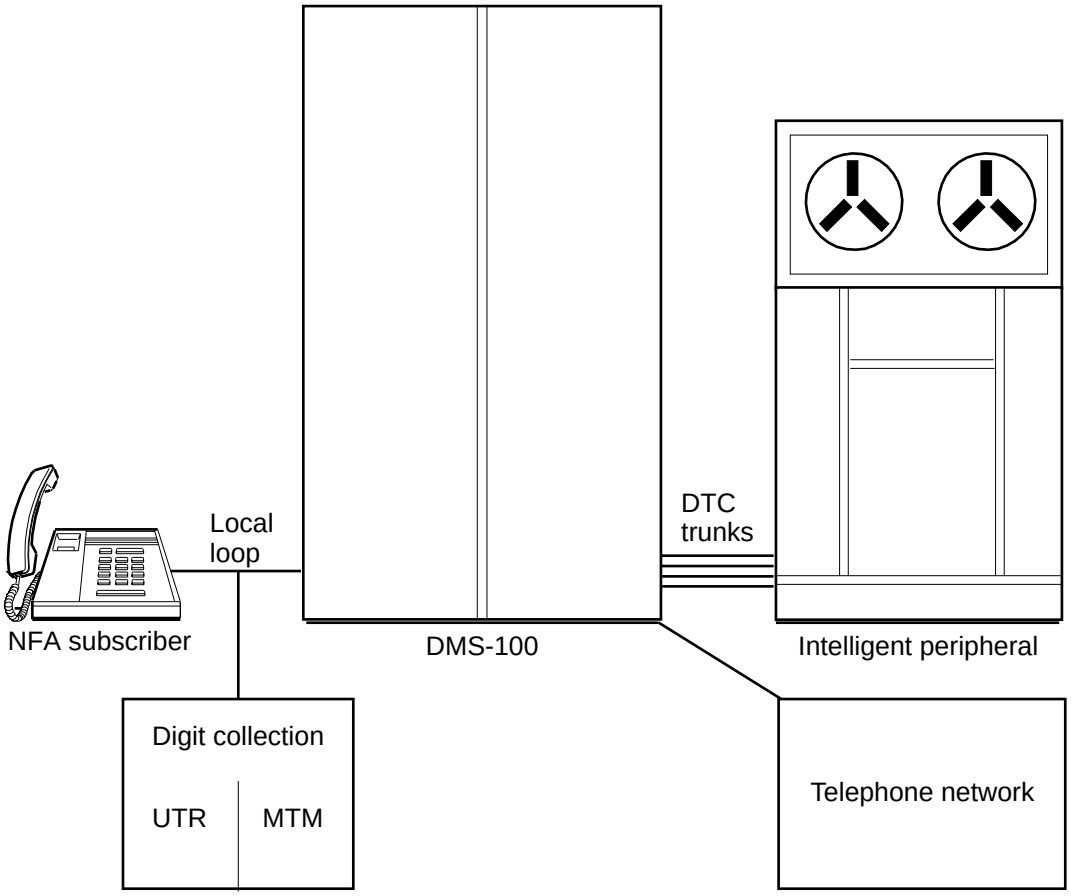
In attempting to establish the implicit connection to the IP, if there are no idle members of the trunk group, an existing trunk operational measurement (OM), TRK_NOVFLATB, is pegged and the connection attempt is aborted. The subscriber does not receive an implicit access in this situation but does retain dial tone and can call process as normal.

Network Facility Access (continued)

Figure 3-2
NFA implicit access

Switch provides:

- Speech path connection to the IP upon every origination of the NFA user
- User identification (ID) and service code transmission to the IP using DTMF signaling
- Digit collection for the NFA user with no noticeable differences
- Trunk supervision to allow the IP to dial
- Ability for the user to enable and disable implicit access by dialing a feature access code (XX)
- Speech path connection to the IP following a flash if digit collection takes place



If there is an idle member of the trunk group, it is seized and the implicit service code and user ID for the line are outpulsed to the IP. These values are datafilled in the subscribers line data in table IBNFEAT. At this point, the DMS switch waits for one of several possible events to occur.

- Answer supervision is received from the NFA trunk. The DMS switch removes dial tone from the line and sets up a two-way voice path between the subscriber and the IP. The subscriber now hears whatever the IP provides over the voice path. Answer supervision can be sent by the NFA trunk before the DMS switch finishes outpulsing digits. However, the DMS switch does not recognize and process the answer supervision until all of the service code and user ID digits have been outpulsed. If the answer is not received from the trunk within a time datafilled in the trunks group data, the trunk is released and the subscriber retains normal call processing ability, since the dial tone would have never been broken.
- The subscriber goes on-hook. The DMS switch drops the trunk connection. This drop can occur before or after answer is received from the NFA trunk.
- The IP goes on-hook, after sending answer supervision to the DMS switch and before dialing a number for the subscriber. The trunk connection is dropped and the DMS switch applies new dial tone to the subscriber, who can now call process as usual. This tone is a normal steady dial tone. The ROH timer is also reset at this time.
- The subscriber dials a digit. The NFA trunk is released. If the subscriber dials a digit before the trunk connection has been completed, the connection attempt is aborted. Call processing now occurs for the subscriber. The first digit dialed by the subscriber is reported to the DMS switch so that disconnection of the IP can proceed as quickly as possible. This disconnection prevents the subscriber from hearing anything from the IP while dialing is taking place.

  Note: The subscriber retains the ability to dial digits throughout the duration of an implicit connection except while the IP is dialing a number for the subscriber.

- After answering, the IP indicates to the DMS switch that it wishes to dial number for the subscriber. Refer to “IP dialing” in this feature description for more information.
- The ROH timer expires without any of the above events occurring. The subscriber receives reorder treatment and the IP connection is dropped.

Network Facility Access (continued)

Stuttered dial tone

When an implicit connection to the IP is being established, if the subscriber line currently has a stuttered dial tone set (due to message waiting being active, for example), then the stuttered dial tone service code is outpulsed to the IP instead of the normal implicit service code.

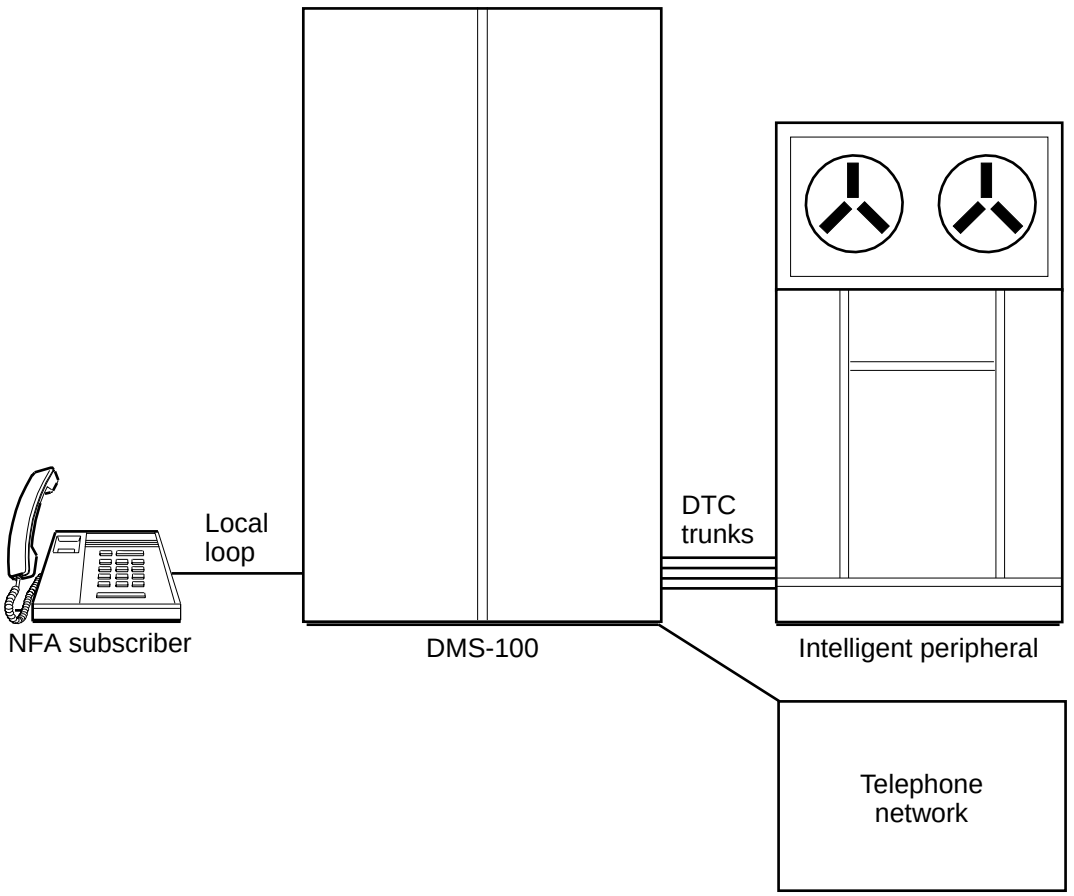
Explicit mode

In the explicit mode, the subscriber must first dial an access code and then is directly connected to the IP. Any DP digits entered by the subscriber, while in the explicit mode, are converted to DTMF digits before being outpulsed to the IP.

Figure 3-3
NFA explicit access

Switch provides:

- Stable line to trunk call established by dialing an NFA explicit access code
- User ID and service code transmission to the IP using DTMF signalling
- DP to DTMF conversion
- Trunk supervision to allow the IP to dial



Network Facility Access (continued)

Explicit operations

The following events take place during an explicit connection.

- The subscriber goes off-hook and enters the digits of an NFA explicit feature access code.

  Note: If the subscriber has been assigned both implicit and explicit NFA access, the implicit NFA connection can be used to dial the explicit NFA feature access code, as described in the previous section.

- The DMS switch determines that the subscriber has dialed an explicit access code. If explicit access is allowed for the line, the DMS switch routes to the NFA trunk group associated with the dialed feature access code. If there are no idle trunk members, the TRK_NOVFLATB OM is pegged, the connection attempt is aborted, and the subscriber receives no circuit treatment (NCRT). If an idle trunk member is seized, the explicit service code and user ID for the line are outpulsed over the trunk. The explicit service code is obtained from the translations datafill associated with the access code for the subscriber. If explicit access for the line is not allowed, the subscriber receives treatment.
- The IP sends answer supervision back to the DMS switch and a stable connection is completed. Answer supervision can be sent by the NFA trunk before the DMS switch finishes outpulsing digits. However, the DMS switch does not recognize and process the answer supervision until all of the service code and user ID digits have been outpulsed.

If the subscriber goes back on-hook at any of the above steps, then the process is aborted and the trunk is disconnected. If the subscriber remains off-hook, the following things can occur:

- The subscriber dials digits. If these are DP digits, they are converted to DTMF before being outpulsed on the NFA trunk to the IP. Refer to "DP to DTMF digit conversion" in this feature description for more information. Unlike the implicit connection, the DMS switch is not performing any digit collection at this point.

- The subscriber flashes. The action taken depends upon the context in which the flash occurs. If the flash's intent is to put the IP connection on hold, then the IP connection is dropped. For example, if the subscriber has a call-waiting tone and is flashing to connect to the incoming call, the IP connection drops off. If the flash does not put the connection on hold, such as when the IP connection is the second leg of a three-way call and the subscriber is flashing to bring in the first party, the flash has no effect on the IP. Any situation that would result in the IP connection being placed on hold results in the trunk connection being disconnected. See sections entitled "Feature limitations and restrictions" in this feature description and "Feature interactions" in this feature description for more information.

  Note: NFA Flash Processing is provided in Feature NC0497, in BCS35 and is available in BCS34 with a patch. The patch provides an implicit access following a flash whenever that flash provides the end user with the ability to dial digits. Refer to Feature NC0497 later in this chapter for additional information.

- The IP indicates that it intends to dial a number for the subscriber. See section entitled "IP dialing" in this feature description for additional information.

If none of the above events occur, the connection remains active until either the subscriber or the IP goes on-hook. If the subscriber goes on-hook, the trunk connection is dropped.

If the IP goes on-hook, standard disconnect treatment occurs for the subscriber. This treatment is controlled in table TMTCNTL.

DP to DTMF digit conversion

DP to DTMF digit conversion is provided to convert DP digits entered from a subscribers customer premises equipment (CPE) to DTMF digits before these digits are outpulsed to the IP. Conversion is provided upon every explicit connection, even for a DTMF line, since such a line could still have a dial pulse CPE in use.

Whether or not a conversion actually occurs is recorded for use in automatic message accounting (AMA). That is, whether the subscriber actually enters a DP digit and it is converted to DTMF. Refer to the section entitled "Billing" in this feature description for additional information.

IP dialing

The IP can dial a number for the subscriber during an implicit or an explicit connection. IP dialing is initiated by the IP sending an inverted wink signal to the DMS switch. An inverted wink is defined with the same timing

parameters as that of a normal wink, as defined in Bellcore specification TR-TSY-000064, *LATA Switching System Generic Requirements, Issue 2*. However, the state changes are inverted. A normal wink is a state change from on-hook to off-hook and back to on-hook, while an inverted wink is a state change from off-hook to on-hook and back to off-hook.

Once the inverted wink is received by the DMS switch, the subscriber is placed on hold, ending DP to DTMF conversion, and a UTR is attached to the trunk. If no UTR is available, the trunk connection is dropped and the subscriber receives no circuit treatment (NCRT). Otherwise, an inverted wink signal is outpulsed back to the IP. The IP then sends DTMF digits to the DMS switch. The end-of-digits dialed is specified either by an inter-digital timeout, as specified in the trunk datafill, or by a # digit. Once an end of digits indication has been obtained, the trunk connection is dropped, the subscriber is removed from hold, and the call proceeds with the digits that were received, as if the subscriber had dialed those digits. If the subscriber goes on-hook while the IP is outpulsing digits to the DMS switch, the trunk is released and any digits received are discarded.

The IP can dial any routable number, such as a directory number (DN), or a feature access code. This also includes one of the NFA feature access codes. The maximum number of digits that the IP can dial is 24. However, the IP can dial only a single string of digits. The concept of a digit separator, in which the IP would be capable of dialing two separate strings of digits for the subscriber, is not supported for this feature.

Refer to “Feature limitations and restrictions” in this feature description for additional information.

Combination of implicit/explicit access

If desired, the office can allow a subscriber line to have both implicit and explicit access. When the subscriber goes off-hook, there is an implicit connection to the IP. When the subscriber dials an explicit access code, the implicit connection is dropped after the first digit is entered and an explicit connection is established after the digits are translated. Depending on the customer group and translations datafill, these two connections can be over the same trunk group or over different trunk groups.

It is also possible for the implicit connection to dial an explicit feature access code for the subscriber. As soon as the feature access code digits have been received from the IP on the implicit access, the NFA trunk connection is dropped and the digits are translated. This action causes a second NFA trunk connection for the explicit access to be established.

Class of service

The NFA line option is supported for lines with line class codes for Residential Enhanced Services (RES) and Meridian Digital Centrex (MDC), previously referred to as Integrated Business Network (IBN). If the first field of the RES_SO_SIMPLIFICATION office parameter, RES_AS_POTS, is set to Y, NFA can also be added to 1FR and 1MR lines. Adding this option to those lines automatically changes the line to a RES line, but it appears to be a 1FR or 1MR line with NFA as a 'RES OPTION.' If RES_AS_POTS is set to N, NFA cannot be added to a 1 FR or 1 MR line but can be added to a RES line. Table 3-1 illustrates the line class code (LCC) compatibility with NFA.

Table 3-1
LCC compatibility with NFA

RES_AS_POTS setting	LCC	Add NFA?	Result
Y	1FR or 1 MR	Y	RES line, but LCC appears as 1 FR or 1 MR. NFA shown as RES option.
	RES - LCC does not exist		
N	1FR or 1 MR	N	- - - -
	RES	Y	NFA added, LCC unaffected
- - - -	IBN	Y	NFA added, LCC unaffected

The addition of the NFA option to a RES or MDC line does not change the flash scanning for that line. If the line already has flash reporting, adding NFA to that line does not eliminate it.

Lines extending from line group controllers (LGC), remote cluster controllers (RCC), subscriber carrier module (SCM), and subscriber module urbans (SMU) are supported.

Network Facility Access (continued)

CPE supporting dial pulse and DTMF tone dialing are supported by this feature. Meridian business sets (MBS) and integrated services digital network (ISDN) sets are not supported.

Additional functionality - inverted wink, flash handling and UTR override

Three additional functions of NFA, inverted wink, flash handling, and UTR override, were developed in BCS35 but can be patched back into the BCS34 loads. If this patch is in place, refer to the feature description NC0497 later in this chapter for information on these functions.

Translations table flow

The Network Facility Access translation process is shown in the flowchart that follows and illustrates NFA, implicit access.

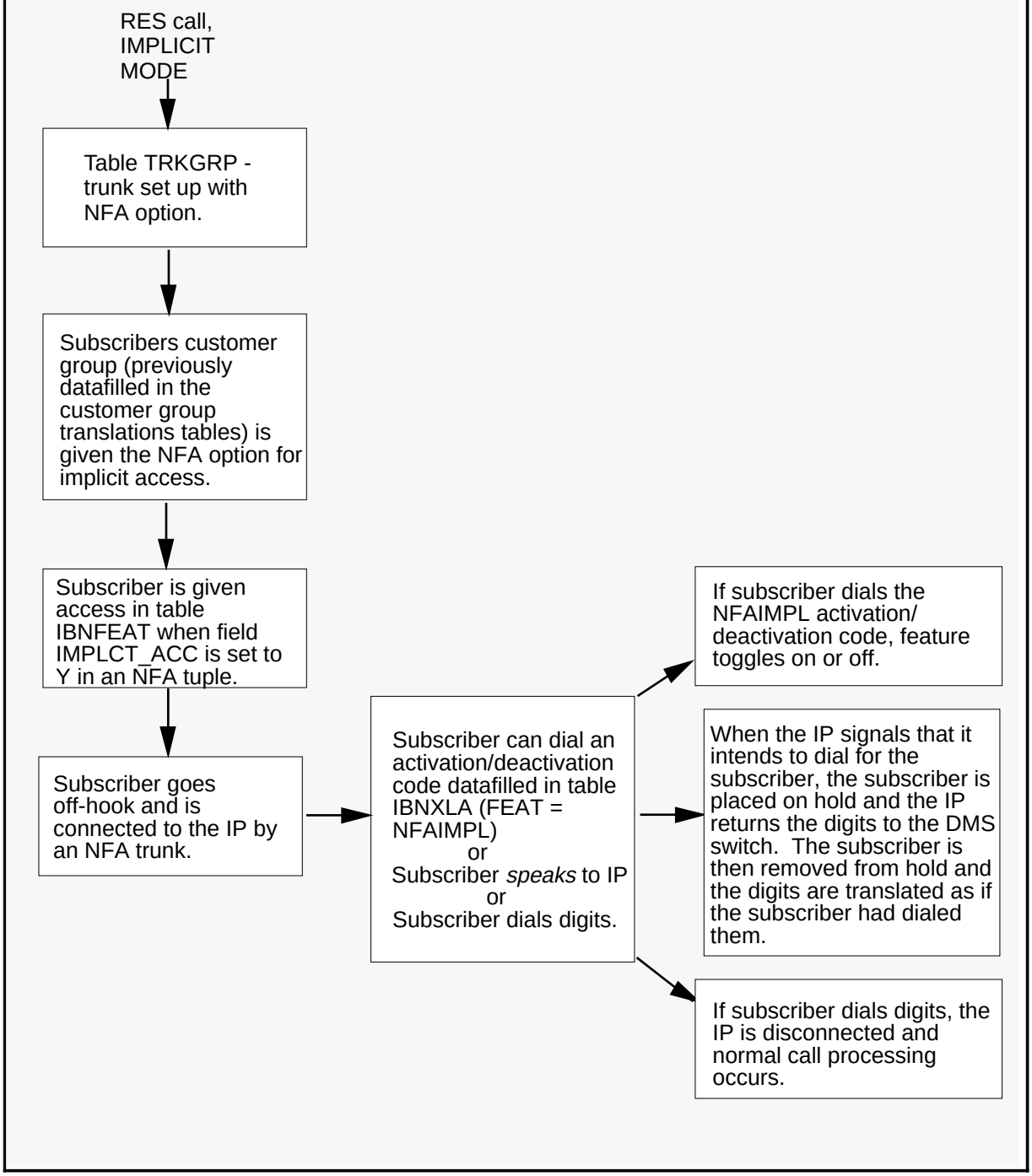
Table TRKGRP contains some of the customer-defined data associated with each trunk group that exists in the switch. Table TRKGRP contains a new trunk group type defined by this feature, NFA. All NFA trunks must be defined with this group type.

Table IBNXLA defines the digit translations for MDC and RES customer groups. This table provides implicit mode activation or deactivation for NFA by defining the access code for NFA implicit mode. Table IBNXLA can also be used to specify the feature access codes that are used to initiate explicit access to an NFA trunk.

Table IBNFEAT defines features added to a subscriber line and contains an NFA feature tuple for every NFA subscriber. This tuple contains all subscriber-specific information associated with NFA.

Network Facility Access (continued)

Table flow for Network Facility Access



Network Facility Access (continued)

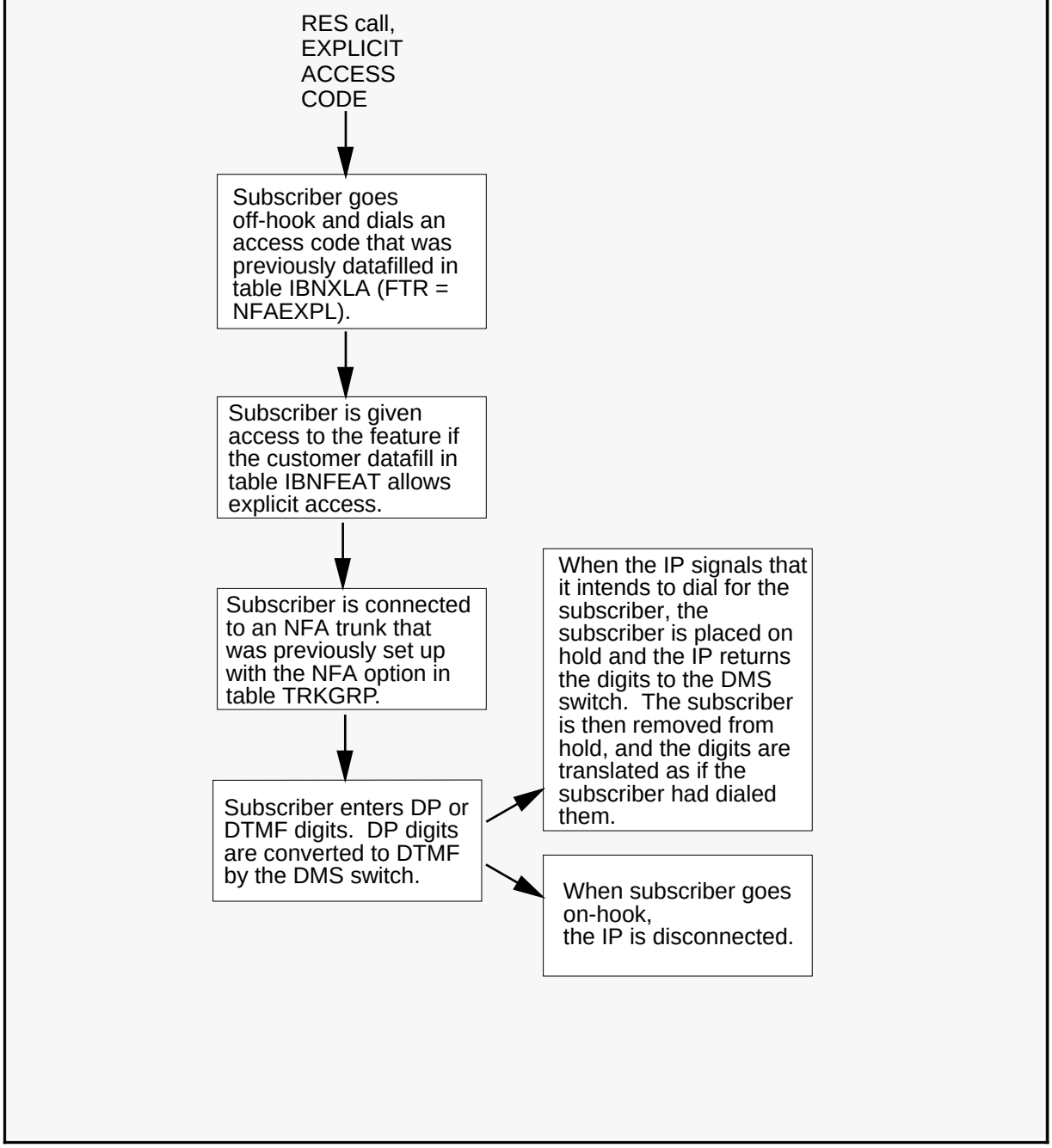
The following table lists the datafill content used in the flowchart example for NFA, implicit access. The example is for an MDC line.

Datafill example for Network Facility Access - Implicit access	
Item	**Example data**
Called number	621-5878
Implicit activation access code	*93
Customer group name	AINIBN
Datafill table	**Example data**
TRKGRP	NFATG1 NFA 0 ELO NCRT NIL MIDL 10
IBNFEAT	HOST 00 0 00 3 NFA NFA 6215878 Y 654 ACT N Y $
IBNXLA	IBNXLA1 93 FEAT N N N NFAIMPL

Network Facility Access (continued)

The following flowchart shows the datafill content used for a RES line.

Table flow for Network Facility Access



Network Facility Access (continued)

The following table lists the datafill content used in the flowchart example for explicit access. The example is for a RES line.

Datafill example for Network Facility Access - Explicit access	
Item	**Example data**
Called number	621-0099
Customer group name	AINRES
Datafill table	**Example data**
IBNXLA	RESXLA1 81 FTR 2 NFAEXPL NFATG2 81
IBNFEAT	HOST 00 0 02 20 NFA NFA 6210099 Y #33 INACT Y Y Y $
TRKGRP	NFATG1 NFA 0 ELO NCRT NIL MIDL 10

Network Facility Access limitations and restrictions

The following limitations and restrictions apply to Network Facility Access:

- The NFA line option is limited to the RES and MDC line class codes. If the RES_AS_POTS field of the RES_SO_SIMPLIFICATION office parameter is set to Y, NFA can also be added to 1FR and 1MR lines. Adding this option to those lines automatically changes the line to a RES line, but it appears to be a 1 FR or 1 MR with NFA as a *RES Option*. If RES_AS_POTS is set to N, NFA cannot be added to a 1FR or 1MR line, but can be added to a RES line; the line class code LCC is RES.
- Lines extending from line module or remote lines module peripherals are not supported by this feature.
- ISDN and electronic business set (EBS) equipment is not supported by this feature.
- The NFA trunk is restricted to immediate start outpulsing and wink start inpulsing.
- The NFA trunk is supported only on UTR-equipped digital trunk controllers (DTCs) or line trunk controllers (LTCs).
- The IP can dial the maximum number of digits for subscribers which they could dial themselves as a single-digit string. In BCS34, this maximum is set to 24 digits. The # digit, used as an end-of-digits indication, is not included in this count.
- NFA implicit access is not compatible with the warm line (WML) option.
- NFA is not allowed at all with the automatic line (AUL) option.

- The NFA trunk connection cannot be placed on hold. Any time the subscriber flashes while connected to the IP and that flash results in the connection being placed on hold, the connection is dropped.

  Note: NFA Flash Processing is provided in Feature NC0497in BCS35 and is available in BCS34 with a patch. The patch provides an implicit access following a flash whenever that flash provides the end user with the ability to dial digits. Refer to Feature NC0497 later in this chapter for additional information.

- An NFA explicit access cannot dial the ring again (RAG) access code.
- NFA is not allowed with the Spontaneous Call Waiting with Identification feature with Disposition (DSCWID).
- The SELSEQ field in table TRKGRP should not be datafilled with values ASEQ (assequential) or DSEQ (desequential) for any NFA trunks which can serve implicit connections. If the trunk is only being used for explicit connections, then this restriction does not apply.

  If an implicit connection is attempted on a trunk which has been datafilled with ASEQ or DSEQ, no trunk circuit is selected and the implicit connection does not occur. The subscriber retains dial tone and can still dial digits manually.
- A new NFA trunk type is defined for connections to the IP. Even though it is implemented as a two-way trunk, no origination is allowed from this trunk. Any origination from this trunk puts it in lock-out state. This trunk can send an inverted wink during any IP connection to dial digits on behalf of a subscriber. Since this trunk is two-way type, parameters such as inpulsing start signal, inpulsing digit signaling, and inter-digit timeout must be datafilled in each trunk subgroup tuple. Refer to "Datafilling table TRKGRP" in this feature description for more details on this new trunk type.

  When the IP is dialing for a subscriber, the # digit or inter-digital timeout indicates the end-of-digit inpulsing. The IP cannot indicate the end of digits by simply going on-hook. Normally, the IP should not drop the connection until after the DMS switch drops the trunk connection usually within two seconds following the # digit or at the end of the inter-digital timeout.

Feature interactions

The Network Facility Access feature interacts with the features described in the following paragraphs.

Network Facility Access (continued)

Flash interactions

A major interaction with this feature concerns flash handling during a connection to the IP. When a subscriber that is connected to the IP flashes, if that flash would usually result in the IP connection being placed on hold, then that connection is dropped instead. The effect of this action on existing calling features is discussed in the following paragraphs.

Three-way calling

A subscriber with NFA can use the three-way calling (3WC) feature, provided that the subscriber is not connected to the IP while using the feature. If connected to the IP, the following applies:

- If the subscriber is connected to the IP explicitly and flashes to initiate a 3WC, the explicit connection is dropped. The subscriber line remains busy and cannot receive any new originations unless it is returned to the on-hook state.
- The subscriber can connect to the IP, by way of an explicit connection only, during the second leg of a 3WC. If there is an explicit connection established to the IP in this situation, and the subscriber flashes to bring in the held party, the IP connection remains. See Note 2. If the controller flashes before the IP has answered, the flash is ignored. A subscriber with active implicit access cannot receive an implicit connection to the IP following a user flash, or any other circumstance which results in delivery of recall dial tone to the line.

  Note 1: The IP must answer before the controller can flash to bring back the held party.

  Note 2: NFA Flash Processing is provided in Feature NC0497 in BCS35 and is available in BCS34 with a patch. The patch provides an implicit access following a flash whenever that flash provides the end user with the ability to dial digits. Refer to Feature NC0497 later in this chapter for additional information.

The IP can still dial a number for the subscriber if it is connected explicitly as the second leg of a 3WC. While the trunk is dialing the number, both parties (controller and other party in the first leg) are on hold. Once the trunk has been released and the call is routing, the controller is removed from hold, but the other party remains. The controller can now flash to bring the first party back into the conference, if desired, or leave the party on hold (as with regular 3WC functionality when a controller has dialed a call on the second leg).

An IP explicit connection can be involved in a 3WC chain, provided that it initially is in the second leg of the original 3WC; that is, it can never be

placed on hold. This chain allows for the possibility of more than one IP connection to be conferenced together. One IP connection for each subscriber in the 3WC chain is possible. If the NFA subscriber flashes in a context that would place the IP on hold during a 3WC chain, the trunk connection is dropped, instead. If the NFA subscriber goes on-hook, the IP connection is not transferred to the other parties in the 3WC chain, but is dropped instead.

Note: As with regular three-way calls, 3WC chaining does not support implicit connections to the IP.

Call waiting

A subscriber with NFA can use this feature, provided the subscriber is not connected to the IP. If the connection to the IP is in place, the following applies:

- If the subscriber is connected to the IP explicitly and another call arrives, the subscriber can flash to receive the call. If the subscriber does flash, the connection to the IP is dropped.
- If the subscriber is connected to the IP explicitly and the IP is currently dialing a number for the subscriber, there is no call waiting tone.
- A subscriber connected to the IP implicitly does not receive call waiting tone at any point in time during the implicit connection.

Call hold

A subscriber cannot place a connection to the IP on hold. If he or she flashes in an attempt to do this, the IP connection is dropped.

After dialing the call hold (CHD) access code, the subscriber receives a new dial tone. He or she does not receive an implicit access to the NFA trunk, in this situation. This is an existing limitation of the CHD feature, which disallows access to any other features until after another number has been dialed following the new dial tone. For example, the warm line (WML) and automatic line (AUL) features also do not operate. An implicit access to the NFA trunk would occur prior to any digits being dialed and is disallowed by CHD.

Note: NFA Flash Processing is provided in Feature NC0497 in BCS35 and is available in BCS34 with a patch. The patch provides an implicit access following a flash whenever that flash provides the end user with the ability to dial digits. Refer to Feature NC0497 later in this chapter for additional information.

Network Facility Access (continued)

Call park

A subscriber cannot park a connection to the IP, whether implicit or explicit. If the subscriber flashes in an attempt to do so, the connection to the IP is dropped.

Other interactions

The Network Facility Access feature interacts with other features described in the following paragraphs.

Speed calling

An NFA subscriber with either short or long speed calling (SC) can use this feature with NFA. This includes instances involving connections to the IP. The subscriber can program an SC code to dial one of the NFA access codes. For example, 70 can be set up to dial the access code for an explicit connection to the IP. This is consistent with existing SC functionality which provides the ability to program in other feature access codes.

The following existing restrictions to this functionality currently apply for feature access codes and also apply to the NFA access codes. The restrictions apply for both the explicit code and the implicit access toggle code.

- Speed calling validation (SCVAL) during programming
  This customer group option, datafilled in table CUSTSTN, allows validation of speed call numbers as they are programmed into the speed call list. This feature does not support validation of feature access codes, and if present, feature access codes cannot be programmed into the speed call list.
- Ambiguous speed call (AMBISC)
  This customer group option, also datafilled in table CUSTSTN, allows speed call entries to be dialed without use of the asterisk (*). This option is incompatible with feature access codes if the code is in the range of speed call codes, that is, from 00 to 69. All feature access codes, including NFA access codes, should be in the range from 70 to 99. If one of the NFA access codes, either explicit or implicit toggle, is set in the range of 00 to 69, then it cannot be used in a speed call list if the AMBISC option is present for the customer group.

Call forwarding

A subscriber can use call forwarding (CF) with NFA. However, the subscriber cannot forward his or her phone directly to the IP or directly to an explicit access feature code.

Warm line

Implicit access is not allowed for lines with the WML option. Explicit access is still allowed. When adding NFA to a line, if WML is present on

the line, the IMPLCT_ACC field is forced to be set to N. When adding WML to a line, if the line already has NFA with implicit access allowed, the option WML cannot be added to the line.

Automatic line

NFA and AUL line options cannot be datafilled on the same line. This restriction is enforced by using table OPTOPT. A tuple for NFA is added into this table. The existing tuple for AUL has NFA added to the other existing options that are incompatible with AUL. The tuple for NFA has AUL listed as its incompatibility. The following example shows sample datafill for these options in table OPTOPT.

Datafill example for table OPTOPT

Example of a MAP display:

```
 OPTION                                          INCOMPAT
-------------------------------------------------------------
    AUL
(ACB) (ACD) (AR) (ARDDN) (CALLOG) (CFBL) CFDA) (CFGD)
(CFGDA) (CFW) (CNAB) (CNDB) (COT) (CPR) (CTD) (CUSD)
(CWD) (DCBI) (DCPU) (DOR) (HOT) (LINEPSAP) (LNR) (MAN)
(MPB) (MPH) (NFA) (ONI) (PBL) (RCHD) (SCL) (SCS) (SCU)
(SC1) (SC2) (SC3) (SLVP) (SMDI) (TDN) (TDV) (UCD)
(UCDSD) (WML) $

    NFA
(AUL) $
```

Spontaneous call waiting ID with disposition

NFA and DSCWID cannot be datafilled on the same line. This restriction is enforced by using table OPTOPT. Refer to the preceding section for an example of this table.

Executive busy override

If an executive busy override (EBO) subscriber attempts to activate EBO against a call that is connected to an NFA trunk, either implicitly or explicitly, the activation fails and the EBO subscriber receives treatment. There is no effect on the NFA call. Barging into an NFA call at certain times (such as while the trunk is dialing) is not desirable.

Call memory

Incoming and outgoing call memory is updated when this feature is involved. This update includes instances in which the IP dials a number for the subscriber. For example, if the IP dials a number for the subscriber, that

number is reflected in the outgoing call memory. If the subscriber later activates last number redial, the number the IP had dialed is the number redialed.

Ring again

The subscriber cannot use the RAG feature for a busy attempt to connect to the IP, either an explicit or implicit attempt. Such an attempt results in treatment.

The subscriber can use the RAG feature for a busy call which was dialed by the IP, from either an implicit or explicit connection. However, the subscriber must dial the RAG activation code. After dialing a busy DN, the subscriber cannot then dial an explicit connection to the NFA trunk and then have the trunk dial the RAG access code to activate that feature. This existing limitation of the RAG feature because it uses routing data to determine which part to activate against. This routing data is updated when accessing the NFA trunk, removing information about the previous call.

Automatic call back

The subscriber cannot use the automatic call back (ACB) feature for a busy attempt to connect to the NFA trunk, either an implicit or an explicit attempt.

The subscriber can have an NFA explicit access dial the ACB access code to activate this feature. For example, after dialing a busy line, the subscriber flashes, dials the NFA explicit access code, then has the NFA trunk dial the ACB activation code. This functionality is possible because ACB uses outgoing call memory instead of routing data. Outgoing call memory is not updated when a feature access code is dialed, so the last busy call is still recorded after accessing the NFA trunk.

Six-port conferencing features

An explicit NFA connection cannot be added to a conference call which has been established using six-port conference circuits. This restriction applies to the Station Controlled Conference feature, as well as any other conferencing features which use these circuits.

Activation/deactivation by the end user

A subscriber is assigned NFA capabilities by assigning the NFA feature to his or her line in table IBNFEAT. When the NFA feature is specified, several additional fields are prompted for to outline subscriber-specific information. The entries in these fields indicate whether or not implicit and explicit accesses are allowed for the subscriber and whether or not implicit access capabilities are active.

A subscriber is allowed implicit access using the feature access code to activate or deactivate this ability. This access code acts as a toggle,

switching the implicit access from ACTIVE to INACTIVE. After entering the implicit activation or deactivation access code successfully, the subscriber receives a confirmation tone and is then provided dial tone or re-origination. If a subscriber is prohibited from implicit access, due to the line datafill, or if the subscriber does not have the NFA feature, he or she receives treatment if the implicit activation or deactivation code is dialed.

Returning the subscriber to dial tone (re-origination) after successfully dialing the feature access code allows the subscriber to determine whether or not the activation or deactivation of implicit access was successful. If the activation of implicit access takes place, the implicit connection to the IP takes place shortly after receiving new dial tone. If the deactivation of implicit access was implemented, there is no implicit connection to the IP.

In order to return the subscriber to dial tone after dialing the feature access code, the LNT tuple in table TMTCNTL must be properly datafilled. This tuple must be datafilled to return to IDLE after CONF treatment. This functionality affects all such confirmation treatments in the office, not just those resulting from NFA. Refer to *Customer Data Schema*, 297-1001-451, for details concerning table TMTCNTRL.

Activation/deactivation of Network Facility Access by the end user

Step	Action	Response
1	For activation, caller goes off-hook and dials the feature access code (set up in table IBNXLA) to activate implicit access.	Confirmation tone is received and implicit access is allowed, assuming line datafill allows this feature. On an office basis, operating company personnel have the option of providing dial tone (or re-origination). This datafill is set up in table TMTCNTRL. An implicit connection to the IP is made, removing dial tone. If this is not provided, the subscriber hangs up and then is able to use the feature when going off-hook again.
2	For deactivation, caller goes off-hook and dials the feature access code to deactivate implicit access.	Confirmation tone is received. There is no implicit connection to the IP and dial tone is not removed.

Billing

The Network Facility Access feature uses Bellcore billing format and uses a module code (047) and two call code types (174 and 175), which use an existing structure code (00001). AMA generation is based on the subscribers datafill. Refer to feature AN0435, “NFA: AMA Modification” on page 3-123 for more information on these module and call code types.

Network Facility Access (continued)

Call type 174 records explicit connections (in BCS34) and remote connections (in BCS35). The terminating DN corresponds to the feature access code used on explicit connections. The terminating DN contains zeros on remote connections.

Call type 175 records calls extended by the IP which would not otherwise generate AMA records.

The following two situations are involved with these codes:

- After a completed explicit connection between an NFA subscriber and the IP, a record with call code 174 using structure code 00001 is generated. The module code 047 is appended to that record. This module is discussed in detail in "Module code 047."
- After an IP dials a call, regardless of whether the IP was accessed implicitly or explicitly, if that call was answered, one of the following two things occurs.
  - If the call does not generate any AMA record, a record with call code 175 and the module 047 appended is generated.
  - If the call does generate an AMA record, the module 047 is appended to that record.

Whether or not the records with the two call codes 174 and 175 are generated is also determined by the following three fields in the NFA line datafill of table IBNFEAT:

- AMA_EXPLCT field
  - If set to N, then no AMA record with call code 174 is generated following an explicit connection to the IP.
  - If set to Y , then an AMA record with call code 174 is generated following an explicit connection to the IP. The terminating number is the feature access code and the module code 047 is appended with NFA specific information. The access method field of module 047 indicates explicit access with the digit 2.
- AMA_IPDIAL field
  - If set to N, then no AMA record is generated following an IP-dialed call in which no other AMA records are generated.
  - In the case where the IP dials a call and another AMA record is normally generated, the module code 047 is still appended to that record, regardless of the setting of this field.

- AMA_REM field (BCS35)
  If set to Y, an AMA record with call code 174 is generated following a remote connection to IP. The originating number is the subscribers DN and the terminating number is all zeros. Module 047 is appended with NFA specific information. The access method field of module 047 indicates remote access with the digit 3.

  Note: The call codes 174 and 175 and module code 047 are only applicable if the call is answered. For explicit access, this means that the IP connection was completed and that the DMS switch received answer supervision from the IP and was able to set up the two-way voice path between the subscriber and the IP. For the IP-dialed case, this means that the party dialed by the IP answered the call.

Call code 174

An AMA record with call code 174 is generated after an explicit connection to the IP has been completed. An explicit connection is considered completed if answer supervision is received from the IP. If the subscriber goes on-hook prior to the IP answering, the IP fails to answer, or if there is no free trunk to connect to the IP, the explicit connection is not completed and no AMA record is generated.

A complete explicit connection is considered finished once the IP connection has been dropped. This drop can occur due to the subscriber going on-hook, the IP going on-hook, the subscriber flashing, or the IP finishing dialing a number.

When a record with this call code is generated, a module with code 047 is also appended to that record. This module code is discussed in detail in "Module code 047."

A record of this call is not generated if the AMA_EXPLCT field in the subscribers line datafill for NFA in table IBNFEAT is set to N.

The call code supports structure code 00001. This feature adds no fields to this structure code.

The terminating NPA field is filled entirely with zeros. This datafill is consistent with existing AMA records which involve dialing numbers other than directory numbers. For example, if the subscriber dials **70* to access the NFA trunk explicitly, the TERM NFA field in the resulting 174 record is '00000C,' where 00000 is the value and C is the delimiter.

Network Facility Access (continued)

The following are the existing fields of this structure code.

Table 3-2
Structure code 00001

Information	Table number	Number of characters
Hexadecimal identifier	00	2
Structure code	0	6
Call type	1	4
Sensor type	2	4
Sensor identification	3	8
Recording office type	4	4
Recording office identification	5	8
Date	6	6
Timing indicator	7	6
Study indicator	8	8
Answer	9	2
Service observed, traffic sampled	10	2
Operator action	11	2
Service feature	12	4
Originating NPA	13	4
Originating number	14	8
Overseas indicator	15	2
Terminating NPA	16	6
Terminating number	17	8
Connect time	18	8
Elapsed time	19	10

For long duration calls, call code 174 also supports structure code 00001. A long duration call is indicated by having a module with code 022 appended to the AMA record. A call is considered long duration if it is connected for more than 24 hours. Each night at midnight, an audit runs detecting such calls. At the time of the audit, if a call is detected which has been connected for greater than 24 hours, it is marked as a long duration call and a long duration record is produced. This record is then produced each additional

midnight that the call is maintained. When the call terminates, the normal AMA record is generated.

An NFA explicit connection can generate a long duration record, if it has been established for more than 24 hours at the time of the audit. This record has the call code 174 with structure code 00001 and also has the 047 module appended to it in addition to module code 022.

Note: As with records using the 174 call code, if the line's AMA_EXPLCT field is set to N, no long duration record with call code 174 is generated.

Call code 175

An AMA record of this call code is generated after an answered call which either would not have normally generated any other AMA records or was dialed for the subscriber by the IP.

The AMA record is generated after the call has completed or one of the parties goes on-hook. Call code 175 supports structure code 00001. This feature adds no fields to the structure code. A record with call code 175 is not generated if the call generates any other AMA record or if the AMA_IPDIAL field in the subscribers line datafill, table IBNFEAT, is set to N.

This call code has the module code 047 appended to it. For more information and an example of an AMA record with call code 047, refer to "Module code 047" and "Examples of AMA records" in this feature description. The format of the structure code 00001 is shown in table 3-2.

Call code 175 also supports structure code 00001 for long duration calls. A long duration record has a module code 022 appended to it to indicate it is a long duration call. Any call dialed by the IP which produces the 175 call code and has no other AMA records associated with it also produces a long duration record, if the call duration warrants its generation. These records have the call code 175 with structure code 00001 and also have the module code 047 appended in addition to module code 022.

Note: As with normal records using the 175 call code, if the line's AMA_IPDIAL field is set to N, no long duration record with call code 175 is generated.

In addition, an IP dialed call which produces other AMA records has module code 047 appended to any long duration records that can result.

Network Facility Access (continued)

Module code 047

Module 047 is appended to all NFA AMA records. This record is appended to both of the AMA records with call codes 174 and 175 and also to any existing AMA records generated following a call dialed by the IP. Table 3-3 shows the information contained in module code 047.

Table 3-3
Module code 047

Field name	Description	Number of characters	Table number
IP service code	Service code sent to IP during connection	6	105 (existing)
Access method	Type of access to IP	2	207 (new)
Subscriber ID	User ID of the subscriber connected to the IP	12	25 (existing)
Conversion required	Whether or not DP/DTMF conversion occurred	2	208 (new)

Note: Conversion required indicates that a DP/DTMF conversion actually occurred; that is, the subscriber entered at least one DP digit which was then converted to DTMF by the DMS switch. If conversion was set up to be provided but the subscriber never entered a digit, this field is set to 1.

Field definitions:

IP service code:

Binary Coded Decimal (BCD) Characters	Meaning
1 - 5	Digits of SC
6	SIGN (hexadecimal C)

Access method:

BCD Characters	Meaning
1	1 - implicit access 2 - explicit access 3 - Remote access (BCS35)
2	SIGN (hexadecimal C)

Subscriber ID:

BCD Characters	Meaning
1	0 (padding)
2 - 11	Digits of USR_ID
2	SIGN (hexadecimal C)

Conversion required:

BCD Characters	Meaning
1	1 - no DP/DTMF conversion 2 - DP/DTMF conversion performed
2	SIGN (hexadecimal C)

Examples of AMA records

Following are several examples of AMA records generated for NFA subscribers.

This first example shows an IP-dialed call that resulted in a record generated of call code 006 with structure code 700. Implicit access was used. The module code 047 is appended to this record.

Figure 3-4
Call code 006 AMA record with module 047 appended

```
HEX ID:  AA   STRUCTURE CODE:40700C   CALL CODE:006C
SENSOR TYPE:036C  SENSOR ID:0000000C
REC OFFICE TYPE:036C
REC OFFICE ID:0000000C  DATE:80217C  TIMING IND:00000C
STUDY IND:0000000C ANSWER:0C SERVICE OBSERVED:0C
OPER ACTION:0C  SERVICE FEATURE:000C
ORIG NPA:919C  ORIG NUMBER:9914276C  OVERSEAS IND:1C
TERM NPA:00212C  TERM NUMBER:2201234C
CONNECT TIME:0427380C  ELAPSED TIME:000002360C
PRESENT DATE: 80217C  PRESENT TIME: 0427380C
MODULE CODE:047C  SERV CODE:  00333C  ACCESS:  1C
SUBSCRIBER ID:09199917246C  CONV REQ:  1C
MODULE CODE:  000C
```

Network Facility Access (continued)

The following example shows an IP-dialed call which would not have normally resulted in an AMA record being generated, but because of the datafill in table IBNFEAT, an AMA record is now produced. Record with call code 175 is generated with structure code 00001. The module code 047 is appended.

Note: Calls extended from remote access in BCS35 show the originating number field (ORIG NUMBER) as the subscribers home DN used during the remote access authorization process.

Figure 3-5
Call code 175 AMA record with module 047 appended

```
HEX ID:  AA   STRUCTURE CODE:40001C   CALL CODE:175C
SENSOR TYPE:036C  SENSOR ID:0000000C
REC OFFICE TYPE:036C
REC OFFICE ID:0000000C  DATE:80217C  TIMING IND:00000C
STUDY IND:0000000C ANSWER:0C SERVICE OBSERVED:0C
OPER ACTION:0C  SERVICE FEATURE:000C
ORIG NPA:919C  ORIG NUMBER:9914276C  OVERSEAS IND:1C
TERM NPA:00203C  TERM NUMBER:9920170C
CONNECT TIME:0427380C  ELAPSED TIME:000002360C
MODULE CODE:047C  SERV CODE:  00133C  ACCESS:  2C
SUBSCRIBER ID:09199917246C  CONV REQ:  2C
MODULE CODE:  000C
```

The following example shows an explicit connection to the IP. A record with call code 174 is generated with the module code 047 appended. DP to DTMF conversion was performed.

Note: In BCS35, when the connection is initiated as a remote access, the terminating number (TERM NUMBER) field of the AMA record is all zeros.

Figure 3-6
Call code 174 AMA record with module 047 appended

```
HEX ID:  AA   STRUCTURE CODE:40001C   CALL CODE:174C
SENSOR TYPE:036C  SENSOR ID:0000000C
REC OFFICE TYPE:036C
REC OFFICE ID:0000000C  DATE:80217C  TIMING IND:00000C
STUDY IND:0000000C ANSWER:0C SERVICE OBSERVED:0C
OPER ACTION:0C  SERVICE FEATURE:000C
ORIG NPA:919C  ORIG NUMBER:9914276C  OVERSEAS IND:1C
TERM NPA:00000C  TERM NUMBER:0000070C
CONNECT TIME:0427380C  ELAPSED TIME:000002360C
PRESENT DATE: 80217C  PRESENT TIME: 0427380C
MODULE CODE:047C  SERV CODE:  12345C  ACCESS:  2C
SUBSCRIBER ID:00000007246C  CONV REQ:  2C
MODULE CODE:  000C
```

Special handling of * and # digits

The possibility of an occurrence of the * or the # digits introduces a special restriction. These characters can exist in the terminating number. For example, a subscriber dials **70* to access the NFA trunk. There is also a possibility of these characters existing in the service code. This service code can be datafilled with * or # by the operating company.

If such a character exists in either the TERM NUMBER field or the 174 record or in the SERV CODE field of the 047 module, the character is suppressed. This functionality is due to a Bellcore specification that all BCD characters must be digits in the range of zero through nine. The symbols * and # are normally represented by hex-B and hex-C digits respectively and are not allowed as values in these records.

If the * or # character is in the middle or far right in the field, it is omitted and the field is right justified. If it is in the far left of a field, it is simply

Network Facility Access (continued)

replaced by the pad value 0. For example, a service code of **3#2* would appear in the SERV CODE field as *00032C*: *000* is padding, *32* is the value, and *C* is the delimiter. If **70* is dialed to access the NFA trunk explicitly, this value would appear in the TERM NUMBER field as *0000070C*. The value *00000* is padding, *70* is the value, and *C* is the delimiter.

Record generation tables

This section contains information showing the records generated during certain combinations of events.

The table below shows the record generated when an implicit connection to the NFA trunk dials a call (non-NFA) for the subscriber.

AMA_ EXPLCT	AMA_ IPDIAL	Other AMA record(s) generated on NFA-dialed call	Call code 175	Call code 174	Module code 047 appended
Does not matter	Y	Y	N	N	Y - To other AMA record
Does not matter	Y	N	Y	N	Y - To 175 record
Does not matter	N	Y	N	N	Y - To other AMA record
Does not matter	N	N	N	N	N

Network Facility Access (continued)

This following table shows the records generated when an explicit connection to the NFA trunk then dials a call (non-NFA) for the subscriber.

AMA_ EXPLCT	AMA_ IPDIAL	Other AMA generated on NFA-dialed call	Call code 175	Call code 174	Module code 047 appended
Y	Y	Y	N	Y	Y - To 174 and other AMA records
Y	Y	N	Y	Y	Y - To other AMA records
N	Y	Y	N	N	Y - To call code 175
N	Y	N	Y	N	Y - To call code 174 and other AMA records
Y	N	Y	N	Y	Y - To call code 174 and other AMA records
Y	N	N	N	Y	Y - To call code 174
N	N	Y	N	N	Y - To other AMA records
N	N	N	N	N	N

Network Facility Access (continued)

The following table shows the records generated if an implicit connection to the NFA trunk then dials an explicit connection.

AMA_ EXPLCT	AMA_ IPDIAL	Call codes 174 or 175 generated	Number of module codes 047 appended
Y	Y	1 - 174	2 to 174
Y	N	1 - 174	2 to 174
N	Y	1 - 175	1 to 175
N	N	None	None

The following table shows the records generated if an explicit connection to the NFA trunk then dials another explicit connection.

AMA_ EXPLCT	AMA_ IPDIAL	Call codes 174 or 175 generated	Number of module codes 047 appended
Y	Y	2 - 174	1 to first 174, 2 to second 174
Y	N	2 - 174	1 to first 174, 2 to second 174
N	Y	1 - 175	1 to 175
N	N	None	None

Call examples

The following sections describe the AMA results for various call examples.

Explicit access, IP dials a call

The subscriber goes off-hook and dials the explicit access code. An explicit connection to the IP is made. The IP dials a number for the subscriber and is disconnected. The AMA_EXPLCT field in the subscribers line datafill is set to Y. At this point, an AMA record is generated with the following information.

- A structure code of 00001 is generated with call type 174.
- Module code 047 is appended.

Network Facility Access (continued)

The call that the IP dialed is then answered. The subscriber converses with the called party and the call is completed. The following are two possibilities that can occur:

- If this is a call that does not generate an AMA record and if the AMA_IPDIAL field in the subscribers line datafill is set to Y, a record with call type 175 is generated, with module code 047 appended. If that field is set to N, no AMA record is generated.
- If this is a call which generates an AMA record, module code 047 is appended to that record. This generation occurs regardless of the datafill in the AMA_IPDIAL field.

Explicit access, IP does not dial a call

An AMA record with the following information is generated after an explicit connection is completed provided that the AMA_EXPLCT field is set to Y:

- structure code of 00001 with call type 174
- module code of 047

If the AMA_EXPLCT field is set to N, no AMA record is generated.

Explicit access, IP dials a call which is not answered

An AMA record with the following information is generated after an explicit connection is completed provided that the AMA_EXPLCT field is set to Y :

- structure code of 00001 with call type 174
- module code of 047

If the AMA_EXPLCT field is set to N, an AMA record is not generated.

No AMA record with call type 175 is generated for the IP-dialed call if the call was not answered. If any other AMA record is generated, the module code 047 is not appended.

Explicit access, IP fails to answer

If the subscriber dials the explicit access code but is not successfully connected to the IP because the IP fails to answer or because there are no trunks available to the IP, no AMA record is generated.

Implicit access, IP dials a call

If the subscriber goes off-hook and is implicitly connected to the IP, the IP dials a number for the subscriber and is disconnected. The call that the IP dialed is then answered. The subscriber converses with the called party and then the call is completed.

Following are two AMA record possibilities that can occur:

- If this call does not generate an AMA record and if the AMA_IPDIAL field in the subscribers line datafill is set to Y, a record with call type 175 is generated with module code 047 appended. If the AMA_IPDIAL field is set to N, no AMA record is generated.
- If the call generates an AMA record, module code 047 is appended to that record, regardless of the setting of the AMA_IPDIAL field.

Implicit access, IP does not dial a call

The subscriber goes off-hook and an implicit connection is made. The connection is completed without the IP dialing a call and the subscriber goes on-hook. No AMA record is generated.

Implicit access, IP dials a call which is not answered

The subscriber goes off-hook and an implicit connection is made. The IP then dials a call for the subscriber. The call is unanswered and the subscriber goes on-hook. No AMA record is generated.

Explicit access, IP fails to answer

The subscriber goes off-hook but the implicit connection is not successfully completed because the IP failed to answer or there are no trunks available to the IP. No AMA record is generated.

Station Message Detail Recording

The Network Facility Access feature does not affect station message detail recording (SMDR).

Datafilling office parameters

When a subscriber goes off-hook, the following steps are made to establish a connection to an NFA trunk:

- seize NFA trunk
- outpulse subscribers service code and user ID
- scan for answer
- establish speech path between subscriber and NFA trunk
- propagate inverted wink on NFA trunk

Three ways have been identified to save the call setup timing for NFA connections and to impact the pre-dial delay timing, the inverted wink duration, and answer detection filter time after the off-hook signal of a trunk has activated the NFA feature. With the new office parameters, each of these values may be adjusted.

Network Facility Access (continued)

The parameters will default to the values which were previously used with NFA signaling. Previously, constant values existed for the pre-dial delay between seizing an NFA trunk and outpulsing the first digit, the filter time for detecting the answer, and the duration of the inverted wink which is sent following cut-through of a speech path between the subscriber and the NFA trunk.

Customers have a method of fine tuning the call setup timing by way of three office parameters in NFA implicit, explicit, and remote access calls. Potentially, the amount of time that it takes to establish an NFA trunk connection could be decreased by up to 210 ms. The recommended value of these parameters is their default value. These parameters should not be decreased unless the customer is using an IP and transmission medium to the DMS-100 switch which can support the shorter timing values. Decreasing any of these office parameters from the default value can impact the grade of service for NFA customers.

The following table shows the office parameters used by Network Facility Access. For information on verification, consequences, and duration on these new NFA office parameters, refer to *Office Parameters Reference Manual*, 297-1001-455.

Office parameters used by Network Facility Access

table name **Parameter**	**Explanation and action**
OFCENG NFA_ANSWER_DETECT_TIME	This parameter indicates the filter time for detecting answer on an NFA trunk. Enter 7, 8 or 9 (70, 80 or 90 ms) for an answer. If the customer is using an IP and transmission medium which can support the shorter timing values, the value can be decreased from the default of 9 (90 ms). The following message will be displayed whenever the value of this parameter is changed from the default of 9: `WARNING: DECREASING THIS OFFICE PARAMETER FROM THE DEFAULT OF 9 CAN IMPACT THE GRADE OF SERVICE FOR NFA SUBSCRIBERS.`

-continued-

Network Facility Access (continued)

Office parameters used by Network Facility Access (continued)

table name **Parameter**	**Explanation and action**
OFCENG NFA_INVERTED_WINK_DURATION	This parameter indicates the upper bound of the duration of the inverted wink, which is propagated by the DMS switch on the NFA trunk when the speech path is established between the subscriber and the NFA trunk. Enter a value from 6 to 10 (ranging between 50 to 60 ms for 6 and 90 to 100 ms for 10). If the customer is using an IP and transmission medium which can support the lower values, the value can be decreased from the default of 10. The following message will be displayed whenever the value of this parameter is changed from the default of 10: `WARNING: DECREASING THIS OFFICE PARAMETER FROM THE DEFAULT OF 10 CAN IMPACT THE GRADE OF SERVICE FOR NFA SUBSCRIBERS.`
OFCENG NFA_PRE_DIAL_DELAY_TIME	This parameter indicates the amount of pre-dial delay between seizing an NFA trunk and outpulsing the first digit. Enter a value from 15 down to 0 (150 ms to 0 ms.) If the customer is using an IP and transmission medium which can support the lower values, the value can be decreased from the default of 15. The following message will be displayed whenever the value of this parameter is changed from the default of 15: `WARNING: DECREASING THIS OFFICE PARAMETER FROM THE DEFAULT OF 15 CAN IMPACT THE GRADE OF SERVICE FOR NFA SUBSCRIBERS.`
End	

Also, NFA: Remote Access, Flash Processing feature, NC0497 in BCS35, introduces a parameter for UTR override which can be patched back to a BCS34 load. Refer to the feature description for NC0497 on page 3-74 for additional information.

Network Facility Access (continued)

Datafill sequence

The following tables require datafill to implement Network Facility Access. The tables are listed in the order in which they are to be datafilled.

Datafill tables required for Network Facility Access

Table	Form	NTP	Purpose of table
CLLI	2100A, B	297-1001-451	Common Language Location Identifier table The NFA trunk group type must be datafilled in table CLLI.
TRKGRP	(None)	297-1001-451	Table TRKGRP contains some of the customer-defined data associated with each trunk group that exists in the switch. A trunk group type (NFA) is added by the Network Facility Access feature. Field answer timeout (ANSTOUT) specifies time in seconds within which the far end of the NFA trunk has to respond with answer supervision after its seizure from the DMS-100 switch.
TRKSGRP	2151A, B, C, D, E, G, H, J, K, L, M, N, O, P	297-1001-451	Table TRKSGRP lists the signaling information for each subgroup which is assigned to one of the trunk groups listed in table TRKGRP. Some fields in a tuple used for NFA are restricted to specific values.
TRKMEM	2152A, B	297-1001-451	Table TRKMEM lists the physical location of each trunk member. This data is assigned to the trunk groups and subgroups specified in table TRKGRP and table TRKSGRP. Fields in a tuple used for NFA are restricted to specific values.
DIGCOL	2201 A, B	297-1001-451	Table DIGCOL is required for the MDC and RES table-driven digit collection system.

-continued-

Network Facility Access (continued)

Datafill tables required for Network Facility Access (continued)

Table	Form	NTP	Purpose of table
XLANAME	2202A, B, C, D	297-1001-451	Table XLANAME lists the translator names tables. This table is used only for storing default data for each translator. For example, when no access code is found in table IBNXLA for that translator, default data in XLANAME is used. If there is not default data for the operating company client group translator, the treatment specified in field VACTRMT in table CUSTHEAD is used.
CUSTENG	2280A, B	297-1001-451	Table CUSTENG defines the engineering parameters and options for each of the customer groups. One of these parameters is the maximum network class of service (NCOS) value (up to 255) which can be assigned to a customer group.
CUSTHEAD	2236A, B	297-1001-451	Table CUSTHEAD contains data which applies to all lines in a customer group. Some data, such as the digit collection name, is entered for each tuple in the table. Other data, such as a feature translator name, is optional.
CUSTNAME	(None)	297-1001-451	Table CUSTNAME defines the customer group names. This is a read-only table. In most of the examples in this chapter, customer group names IBNTST and RESGRP were used.
NCOS	2204A, B	297-1001-451	Network Class of Service table NCOS and a subscribers customer group are used to index to table NCOS, which specifies the feature translator name in field FEATXLA. The *XLAS* option must be used for field NCOSOPTN in order to specify a feature translator name in the FEATXLA field.

-continued-

Network Facility Access (continued)

Datafill tables required for Network Facility Access (continued)

Table	Form	NTP	Purpose of table
CUSTSTN	2238A, B	297-1001-451	Table CUSTSTN defines datafill specific to a customer group. This table specifies options on a customer group basis. This feature creates a new NFA option to be entered for implicit access. Two fields associated with this NFA option are IMPLTKGP and STDSC. The NFA option is added to the OPTNAME and OPTION fields.
IBNLINES	2227A, B	297-1001-451	Table IBN lines is used to specify the customer group of an individual MDC or RES line. Also specified are a subgroup, the serving NPA (SNPA) and a NCOS. For MDC lines, the customer group is specified in this table. For RES lines, a line attributes index (LAI) into table LINEATTR is used. This LAI is specified in IBNLINES and must be marked in table LINEATTR as supporting RES lines.
LINEATTR	2208A, B	297-1001-451	Table LINEATTR is used to identify the customer group for RES lines, as well as subgroup and NCOS. The LAI must be marked as supporting RES before the conversion from plain old telephone service (POTS) to RES will be performed, by setting the RESINFO field to Y. It is recommended that all RES lines be entered in the same customer group.

-continued-

Datafill tables required for Network Facility Access (continued)

Table	Form	NTP	Purpose of table
IBNXLA	2228A, B, C, D	297-1001-451	Table IBNXLA, the MDC translations table, stores the data for the digit translation of calls from an MDC station, an attendant console, and an incoming or an incoming side of a two-way MDC trunk group. Based on the feature translator specified in table NCOS, the entries in table IBNXLA determine the access code or codes which will be valid for a subscriber to dial in order to activate the NFA explicit access mode. Data feature, NFAIMPL, is added by this NFA feature for activation or deactivation of implicit access. Also, FTR selector, NFAEXLPL, is added to datafill the access code for explicit access.
IBNFEAT	2217A, B	297-1001-451	Table IBNFEAT defines the NFA features for a subscribers line. Data feature, NFA, is added.
End			

Datafilling table TRKGRP

A trunk group type, NFA, is defined by this activity. The NFA trunk group type is a two-way trunk type with DTMF signaling capability. Even though it is a two-way trunk, NFA trunks cannot originate incoming calls to the DMS-100 switch. If an NFA trunk originates an incoming call to the DMS-100 switch, the trunk is placed in a lockout state.

The current trunk (TRK) logs to indicate trunk transition to and from lockout state are pegged. The NFA trunk should support testing similar to standard trunk outgoing (TO) type trunk. If no idle NFA trunk is available for a call, the existing peg to indicate a call being deflected from an outgoing group is incremented. This OM is TRK_NOVFLATB.

NFA implements a datafill field, ANSTOUT, to specify the time in seconds within which the trunk must respond with answer supervision after its seizure. Typically, this time should be less than the ROH timer used to time the receipt of the first digit from a subscriber.

Network Facility Access (continued)

The NFA trunks must be equipped only on DTC and LTC peripherals. These peripherals must be equipped with UTRs.

The following procedure shows the datafill for table TRKGRP. This procedure contains only those fields that apply to Network Facility Access. Refer to *Customer Data Schema*, 297-1001-451, for a description of the other fields.

Note: The trunk group name used for NFA trunk group type must be datafilled in table CLLI prior to its use in table TRKGRP, as is done currently for any other tuple in table TRKGRP.

Datafilling table TRKGRP

Field	Subfield	Explanation and action
GRPKEY		*Group type* This field consists of subfield CLLI.
	CLLI	*Common language location identifier* This is the name of the identifying trunk group, previously datafilled in table CLLI.
GRPINFO		*Variable group data* The subfields vary depending upon the GRPTYP datafill.
	GRPTYP	*Group type* The value NFA is added to the range of values for this existing field. Group type NFA must be used for all NFA trunk connections to an IP.
	ANSTOUT	*Answer time-out* This is a field added for NFA trunk group type. It specifies time in seconds within which the far end of the NFA trunk has to respond with answer supervision after its seizure from the DMS-100 switch. Valid entries are from 5 to 15.

Datafill example for table TRKGRP

The following example shows sample datafill for Network Facility Access in table TRKGRP. In the example, Network Facility Access is assigned to trunk group NFATKG1, and the field ANSTOUT is assigned the value of 12.

Datafill example for table TRKGRP

Example of a MAP display:

```
GRPKEY
                                          GRPINFO
-------------------------------------------------------------
NFATKG1
      NFA  0  ELO  NCRT  NIL  MIDL  12
```

Datafilling table TRKSGRP

The trunk subgroup tuple provides information for the type of signaling, digit outpulsing, and inpulsing. The standard signaling data selector tuple is used, but as a result of NFA, some of the fields are restricted to specific values.

Even though an NFA trunk is not allowed origination, it is implemented as a two-way trunk type. An NFA trunk has the capability to specify parameters in its trunk subgroup tuple, such as incoming pulsing type, incoming digit dial start signal, and inter-digital timing. This capability is provided, in addition to parameters related to its use as an outgoing trunk. These inpulsing parameters are necessary when this type of trunk sends inverted wink to the DMS-100 switch to dial digits for the subscriber.

The NFA trunk must use immediate signaling for outpulsing of digits to the IP. The NFA trunk is restricted to wink start signaling for incoming direction when the IP dials digits for the subscriber during a stable call. The immediate and wink signaling parameters follow existing standards of the LSSGR TR-TSY-000064.

The following procedure shows the datafill for table TRKSGRP. This procedure contains all fields, not only those fields that apply to Network Facility Access. Refer to *Customer Data Schema*, 297-1001-451, for additional information.

Note: Table TRKSGRP is not modified by NFA. However, the fields used for NFA trunk group type are restricted to specific values.

Network Facility Access (continued)

Datafilling table TRKSGRP		
Field	**Subfield**	**Explanation and action**
SGRPKEY		*Subgroup key* This field is composed of subfields CLLI and SGRP.
	CLLI	*Common language location identifier* CLLI is any valid defined trunk group name, as previously defined in table CLLI.
	SGRP	*Subgroup number* Valid entries are 0 for digital or 1 for analog.
CARDCODE		*Card code* The type of card for NFA is restricted to DS1SIG. Enter DS1SIG in this field.
SGRPVAR		*Variable subgroup data* For standard, this field consists of the subgroups SIGDATA, DIR, IPULSTYP, ISTARTSG, OVLP, PSPDSEIZ, PARTDIAL, OPULSTYP, OSTARTSG, IDGTIME, NUMSTOPS, GLAREYD, CCONT, RINGBCK, ESUPR, SAT, REMBSY, DIALMODE, TRKGRDTM, and ECSTAT.
	SIGDATA	*Signaling data* Signaling data selector is restricted to standard signaling. Enter STD for standard.
	DIR	*Direction* The direction of NFA trunk group is only two way. Enter 2W.
	IPULSTYP	*Incoming type of pulsing* The incoming type of pulsing is restricted to Digitone (DT). Enter DT.
	ISTARTSG	*Incoming start dial signal* The incoming start dial signal is restricted to wink (WK). Enter WK.
	OVLP	*Overlap outpulsing* The overlap outpulsing is not applicable to DP trunks. It is set to N. Enter N.
	PSPDSEIZ	*Permanent signal or partial dial on seizure timing* Valid entries are from 2 to 30 seconds.

-continued-

Network Facility Access (continued)

Datafilling table TRKSGRP (continued)

Field	Subfield	Explanation and action
	PARTDIAL	*Partial-dial timing* Valid entries are from 2 to 30 seconds.
	OPULSTYP	*Outgoing type of pulsing* Outgoing type of pulsing is restricted to DT. Enter DT.
	OSTARTSG	*Outgoing start dial signal* The outgoing start dial signal is restricted to immediate dial (IM). Enter IM.
	IDGTIME	*Inter-digital timing* Enter a value for inter-digital timing from 0 to 100. Enter the digit for the number of 10 milliseconds for timing between digits. For example, a value of 5 will produce a 50 millisecond break after each outpulsed digit.
	NUMSTOPS	*Number of stop/goes* Number of stop/goes is used with DP intertoll trunks. It is not applicable to NFA trunks and is restricted to 0. Enter 0.
	GLAREYD	*Yield to glare* Glare yield is used for two-way trunks. Since NFA trunks are not allowed to originate incoming calls, this field is restricted to N (no). Enter N.
	CCONT	*Coin control* Coin control is not applicable to NFA and is restricted to no. Enter NO.
	RINGBCK	*Ringback* Ringback is not applicable to NFA and is restricted to no. Enter NO.
	ESUPR	*Echo suppressor* Echo suppressor is not applicable to NFA and is restricted to N. Enter N.
	SAT	*Satellite* Satellite routing is not applicable to NFA and is restricted to N. Enter N.
	REMBSY	*Remote make busy* Remote make busy is not allowed for NFA and is restricted to N. Enter N.

-continued-

Network Facility Access (continued)

Datafilling table TRKSGRP (continued)

Field	Subfield	Explanation and action
	DIALMODE	*Dial mode* Dial mode is restricted M (machine dialed) since the IP is dialing from the far end. Enter M.
	TRKGRDTM	*Trunk guard timing* Trunk guard timing is used with its existing allowed range of values from 1 (10 milliseconds) to 255 (2.5 seconds).
	ECSTAT	*Echo canceller status* Echo equipped status is not applicable to NFA trunks and is restricted to unequipped (UNEQ). Enter UNEQ.
		End

Datafill example for table TRKSGRP

The following example shows sample datafill for Network Facility Access in table TRKSGRP. In the example, Network Facility Access is assigned to the subgroup key (SGRPKEY) field and defines the common language location identifier (CLLI) for NFA trunk type.

Datafill example for table TRKSGRP

Example of a MAP display:

```
   SGRPKEY       CARDCODE
                                                SGRPVAR
________________________________________________________________
   NFATKG1         DS1SIG
STD 2W DT WK N 10 10 DT IM 5 0 N NO NO N N N M 50 UNEQ
```

Error messages for table TRKSGRP

Listed below are some of the error messages for table TRKSGRP datafill for the NFA feature.

Error messages for table TRKSGRP

Error message	Explanation and action
`NFA trunk must be two way trunk`	Subfield DIR in field SGRPVAR needs to be datafilled with 2W.
-continued-	

Error messages for table TRKSGRP (continued)	
Error message	**Explanation and action**
NFA trunk must be wink start incoming	Subfield ISTARTSG in field SGRPVAR needs to be datafilled with WK.
NFA trunk must NOT have OVERLAP outpulsing	Subfield OVLP in field SGRPVAR needs to be datafilled with N.
NFA trunk must be DIGITONE outpulsing	Subfield OPULSTYP in field SGRPVAR needs to be datafilled with DT.
NFA trunk must be IMMEDIATE START outgoing	Subfield OSTARTSG in field SGRPVAR needs to be datafilled with IM.
NFA trunk must NOT have STOP AND GO	Subfield NUMSTOPS in field SGRPVAR needs to be datafilled with 0.
NFA trunk must NOT have GLARE YIELD	Subfield GLAREYD in field SGRPVAR needs to be datafilled with N.
NFA trunk must NOT have COIN CONTROL	Subfield CCONT in field SGRPVAR needs to be datafilled with NO.
NFA trunk must NOT have RING BACK	Subfield RNGBCK in field SGRPVAR needs to be datafilled with NO.
NFA trunk must NOT have ECHO SUPPRESSOR	Subfield ESUPR in field SGRPVAR needs to be datafilled with N.
NFA trunk must NOT have SATELLITE ROUTING	Subfield SAT in field SGRPVAR needs to be datafilled with N.
NFA trunk must NOT have REMOTE BUSY	Subfield REMBSY in field SGRPVAR needs to be datafilled with N.
NFA trunk must be set to MACHINE DIALED	Subfield DIALMODE in field SGRPVAR needs to be datafilled with M.
ECSTAT must be UNEQ for NFA trunks	Subfield ECSTAT in field SGRPVAR needs to be datafilled with UNEQ.
End	

Datafilling table TRKMEM

Table TRKMEM indicates the physical location of a trunk, as well as the trunk group and trunk subgroup to which it belongs. If the trunk group type is NFA, its physical location is confined either to a DTC or to an LTC peripheral. These peripherals must be equipped with UTRs.

The following procedure shows the datafill for table TRKMEM. This procedure contains only those fields that apply to Network Facility Access

Network Facility Access (continued)

Refer to *Customer Data Schema*, 297-1001-451, for a description of the other fields.

Datafilling table TRKMEM

Field	Subfield	Explanation and action
MEMVAR		*Variable data for members* For an NFA trunk member, the type of peripheral module (PM) in this field must be either a DTC or a LTC and must be equipped with UTR.

Datafill example for table TRKMEM

The following example shows sample datafill for Network Facility Access in table TRKMEM. In the example, Network Facility Access is assigned to a DTC.

Datafill example for table TRKMEM

Example of a MAP display:

```
CLLI         EXTRKNM   SGRP                 MEMVAR
___________________________________________________
NFATKG1          0         0          DTC   0   2   4
```

Error messages for table TRKMEM

Listed below are some NFA-specific error messages for table TRKMEM.

Error messages for table TRKMEM

Error message	Explanation and action
`PM is not equipped with UTR for NFA`	Datafill was attempted on a circuit with no UTRs. Make certain the circuit has UTRs and re-enter datafill.
`NFA trunk must be on LTC or DTC`	If the PM is not a LTC or DTC, this error message will result. For a NFA trunk member, the type of PM must be datafilled as a LTC or DTC.

Datafilling table IBNXLA

The implicit mode for NFA can be activated and deactivated from a subscriber line which has the NFA option. This is provided by defining an access code in table IBNXLA for NFA implicit mode. The active or inactive status of the implicit mode is toggled every time that the access code is

entered from the subscriber line. Refer to "Datafill example of table IBNXLA" in this feature description for example datafill of the NFA implicit activation or deactivation access code in table IBNXLA.

Based on the feature translator specified in table NCOS, the entries in table IBNXLA determine which access code or codes are valid for a subscriber to dial to activate NFA explicit mode. More than one access code can be specified. Each access code should specify a unique service code which is sent to the IP to indicate the service desired.

Using the FTR selector in subfield TRSEL of table IBNXLA, this feature creates a value, NFAEXPL. This value can be entered for the FTR_NAME subfield to identify NFA explicit mode. There are two subfields associated with the NFAEXPL entry:

- EXPLTRGP subfield
  This field identifies the trunk group used to connect to the IP for explicit access. This trunk group must be an NFA trunk group previously datafilled in table TRKGRP.
- EXPL_SC subfield
  This field specifies a 1 to 5 digit service code which is outpulsed to the IP during an explicit connection. The digits are in the range from 0 to 9, # or *.

The following procedure shows the datafill for table IBNXLA. This procedure contains only those fields that apply to Network Facility Access. Refer to *Customer Data Schema,* 297-1001-451, for a description of the other fields.

The trunk group selected for the EXPLTKGP subfield must be previously datafilled in table TRKGRP. Also, the NTXR25AA feature package must be present in the load or NFAIMPL and NFAEXPL do not appear in the valid range of values for their respective fields.

Note: Options are added to IBNXLA using table control. The Service Order System (SERVORD) cannot be used.

Network Facility Access (continued)

Datafilling table IBNXLA		
Field	**Subfield**	**Explanation and action**
RESULT		*Result* This field consists of several subfields, depending upon the feature datafilled.
	FEATURE	*Feature field* Option NFAIMPL is added to this table for use in activation or deactivation of the implicit access for NFA subscribers. Enter NFAIMPL if datafilling for implicit access.
	FTR_TYPE	*FTR selector* Option NFAEXPL is added to datafill access codes for explicit access. Enter NFAEXPL if datafilling for explicit access.
If FTR_TYPE is set to NFAEXPL, subfields EXPLTKGP and EXPL_SC require datafill.		
	EXPLTKGP	*Explicit trunk group* Enter the trunk group over which an explicit connection is made. The trunk group entered must have been already datafilled in table TRKGRP with a GRPTYP of NFA.
	EXPL_SC	*Explicit service code* Enter the service code to be outpulsed over the NFA trunk during an explicit access. Valid entries are from 1 to 5 digits, from 0 to 9, #, or *. Also, a $ can be entered to indicate that a service code is not assigned to this subscriber.

Datafill example for table IBNXLA

The following example shows sample datafill for Network Facility Access in table IBNXLA. In the example, four access codes are set up for implicit and explicit access, two for implicit and two for explicit access.

Datafill example for table IBNXLA

Example of a MAP display:

```
       KEY                                RESULT
 NFAXLA1  33            FEAT  N  N  N  NFAIMPL
 NFAXLA2  33            FEAT  N  N  N  NFAIMPL
 NFAXLA1  44            FTR 2 NFAEXPL NFATKGP1 9999
 NFAXLA2 145            FTR 3 NFAEXPL NFATKGP3  145
```

Network Facility Access (continued)

Listed below is an example of the datafill for the NFA implicit activation or deactivation access code. The example shows the ability to assign different access codes for subscribers which are assigned different feature translator names in XLANAME field.

Datafill example for table IBNXLA

Example of a MAP display:

KEY		RESULT				
IBNXLA1	93	FEAT	N	N	N	NFAIMPL
NFAXLA2	94	FEAT	N	N	N	NFAIMPL

Listed below is an example of the datafill for NFA explicit access codes. Subscribers assigned to the same customer group can be assigned to different NCOS, which allows for the assignment of distinct feature translator names.

The following example illustrates a number of things. First, those subscribers assigned the feature translator of *IBNXLA1* are capable of entering two NFA access codes to access the IP by way of two distinct trunk groups. Subscribers assigned the feature translator of *NFAXLA12* are only capable of entering one NFA access code. Also, the service code sent to the IP, field EXPL_SC, can be the same digits as the dialed access code, or can be any digit string from 1 to 5 digits in length.

Datafill example for table IBNXLA

Example of a MAP display:

KEY		RESULT				
IBNXLA1	81	FTR	2	NFAEXPL	NFATG1	81
IBNXLA1	82	FTR	2	NFAEXPL	NFATG2	82
NFAXLA2	81	FTR	2	NFAEXPL	NFATG1	54#81

Network Facility Access (continued)

POTS subscribers are able to dial digits without any prefix (such as *) to activate certain features. For example, a POTS subscriber can dial *72* to program his or her call forwarding. If a POTS subscriber has NFA added to his or her line, that line is changed to a RES line. Special datafill is possible for RES lines to retain the ability to activate features by use of the AMBIG selector in table IBNXLA. The following example uses call forward programming to illustrate this functionality.

Datafill example for table IBNXLA

Example of a MAP display:

```
        KEY                                        RESULT
-------------------------------------------------------------
RESXLA1  72              FEAT  N  N    N   CFWP
RES1     72              AMBIG 2  RESXLA1 RESXLA1
```

Datafilling table CUSTSTN

Table CUSTSTN is used to specify options on a customer group basis. This feature creates an NFA option for implicit access. The following are two subfields associated with this NFA option:

- IMPLTRGP subfield
  This subfield identifies the trunk group used to connect to the IP for implicit access. This trunk group must be an NFA trunk group previously datafilled in table TRKGRP.
- STDSC subfield
  When the subscriber line has a stuttered dial tone, this subfield specifies a one to five-digit special service code which is outpulsed to the IP instead of the service code entered for field IMPLCT_SC in table IBNFEAT. The digits used are in the range from 0 to 9, #, or *. Also, a $ can be entered to indicate that a service code is not assigned to this subscriber.

This NFA option must be added to table CUSTSTN in order for any of the lines in the customer group to have implicit access. If not, the IMPLCT_ACC field for NFA in table IBNFEAT cannot be set to Y when adding the NFA option to a subscriber line.

Refer to “Datafill example for table CUSTSTN” in this feature description for an example of the datafill for the NFA option in table CUSTSTN.

The following procedure shows the datafill for table CUSTSTN. This procedure contains only those fields that apply to Network Facility Access Refer to *Customer Data Schema*, 297-1001-451, for a description of the other fields.

The implicit trunk group name must already be datafilled in table TRKGRP.

Datafilling table CUSTSTN		
Field	**Subfield**	**Explanation and action**
CUSTNAME		*Customer group name* This field specifies a customer group name. Enter the 1 to 16 alphanumeric character name which is assigned to the customer group.
OPTNAME		*Option name* This field specifies an option name. Enter NFA.
OPTION		*Option* This field specifies an option name. Enter NFA.
If OPTION is set to NFA, subfields IMPLTKGP and STDSC require datafill.		
	IMPLTKGP	*Implicit trunk group* Enter the alphanumeric trunk group name over which an implicit connection is made for lines in the customer group. (The trunk group chosen must already be datafilled in table TRKGRP with a GRPTYP of NFA.)
	STDSC	*Stuttered dial tone service code* This subfield is a vector of one to five digits. Enter the service code (0 - 9, #, *) which is outpulsed over the implicit trunk group (IMPLTKGP) during an implicit connection, if the line has stuttered dial tone. Also, a $ can be entered to indicate that a service code is not assigned to this subscriber.

Datafill example for table CUSTSTN

The following example shows sample datafill for Network Facility Access in table CUSTSTN. In the example, the customer groups IBNTST and RESGRP are assigned the NFA option.

Network Facility Access (continued)

Datafill example for table CUSTSTN

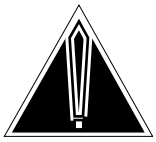
Example of a MAP display:

```
CUSTNAME   OPTNAME                          OPTION
-------------------------------------------------
IBNTST     NFA              NFA       NFATKGP1  44
RESGRP     NFA              NFA       NFATKGP2  55
```

Datafilling table IBNFEAT

Table IBNFEAT adds features to a subscriber line. Features NC0418 and NC0497 allow the NFA feature to be added to a subscriber line.

The following procedure shows the datafill for table IBNFEAT. This procedure contains only those fields that apply to Network Facility Access. Refer to *Customer Data Schema,* 297-1001-451, for a description of the other fields.



CAUTION

Use the Service Order System, not table editor, to add and delete a tuple to and from table IBNFEAT.

Using table editor to datafill this table can result in incompatible features being assigned to the line. The table datafill shown here is for information only.

Table IBNFEAT describes line features for NFA lines. Refer to "Service orders" in this feature description for information on completing table IBNFEAT using SERVORD commands.

Datafilling table IBNFEAT

Field	Subfield	Explanation and action
DF		*Data feature* A value of NFA is added for this field to indicate Network Facility Access. Enter NFA.
FEATURE		*Data feature* A value of NFA is added for this field to indicate Network Facility Access. Enter NFA. The following fields are then prompted for information.

-continued-

Network Facility Access (continued)

Datafilling table IBNFEAT (continued)

Field	Subfield	Explanation and action
DATA		*Data* This field consists of many subfields. Explanations follow.
	USR_ID	*User identification* This is a 1 to 10 digit subfield that specifies the lines user ID.
	IMPLCT_ACC	*Implicit access* This subfield, if marked *Y*, gives the subscriber implicit access to the NFA trunk.
If IMPLCT_ACC is set to Y, subfields IMPLTCT_SC and IMPLCT_STAT require datafill.		
	IMPLCT_SC	*Implicit service code* This is a 1 to 5 digit field that specifies the service code which is outpulsed over the NFA trunk during an implicit access. Valid entries are digits in the range of 0 to 9, *, # or $. ***Note:*** When adding the SC, if the * or the # values are used, the entire entry should be surrounded by single quotes, such as '**33*.' Also, a $ can be entered to indicate that a service code is not assigned to this subscriber.
	IMPLCT_STAT	*Implicit status* Valid entries are ACT or INACT. The ACT value specifies that the subscribers implicit access is active and the subscriber has implicit access to the NFA trunk when going off-hook. INACT specifies the implicit access is inactive.
	EXPLCT_ACC	*Explicit access* A value of Y in the EXPLCT_ACC subfield gives the subscriber explicit access to the IP.

-continued-

Network Facility Access (continued)

Datafilling table IBNFEAT (continued)

Field	Subfield	Explanation and action
If EXPLCT_ACC is set to Y, subfields AMA_EXPLCT, AMA_IPDIAL, and REM_ACC require datafill.		
	AMA_EXPLCT	*Automatic message accounting explicit* The AMA_EXPLCT subfield controls the generation of an AMA record following an explicit connection to the IP. Refer to "Billing" in this feature description for more details.
	AMA_IPDIAL	*Automatic message accounting, intelligent processor dialed* The AMA_IPDIAL subfield controls the generation of an AMA record following a call which was dialed by the IP. This field defaults to *N*. Refer to "Billing" in this feature description for more details of the AMA record and how this field impacts the generation of AMA records.
	REM_ACC	*Remote access* This subfield specifies whether the line is allowed remote access. Valid entries are Y or N.
End		

Datafill example for table IBNFEAT

The following example shows sample datafill for Network Facility Access in table IBNFEAT. In the example, Network Facility Access is assigned to the LEN HOST 0 0 2 18,
HOST 0 0 2 19, and HOST 0 0 2 20.

Datafill example for table IBNFEAT

Example of a MAP display:

```
       LEN
            DNNO  DF     FEATURE                          DATA
-------------------------------------------------------------------
HOST 0 0 2 18
             0    NFA     NFA     12345   Y 654 ACT   N   Y
HOST 0 0 2 19
             0    NFA     NFA     9199917246  N   Y Y N
HOST 0 0 2 20
             0    NFA     NFA     1111111111 Y #33 INACT Y Y Y
```

Table LCCOPT

The following procedure shows table LCCOPT, a read-only table which lists the line options for each LCC. Refer to *Customer Data Schema*, 297-1001-451, for a description of the other fields.

Datafilling table LCCOPT

Field	Subfield	Explanation and Action
COMPAT		*Compatible line option* This field contains all options which are compatible with the line class code specified in the key field.

Datafill example for table LCCOPT

The following example shows sample datafill for Network Facility Access in table LCCOPT, a read-only table. In the example, the compatible options for table LCCOPT are shown.

Datafill example for table LCCOPT

Example of a MAP display:

```
LCC
                                                    COMPAT
-------------------------------------------------------------

  RES
(ACB) (ACRJ) (AMATEST) (AR) (ARDDN) (ATC) (BCLID)
(CCW) (CDT) (CFBL) (CFDA) (CFDGA) (CFRA) (CFW) (CIR) (CLF)
(CPU) (CTD) (CWR) (CWT) (CXR) (DDN) (DGT) (DLH) (DNH) (DOR)
(ftrgrp) (GIC) (GND) (HOT) (ILB) (IMB) (INT) IRR) (LCDR)
(LOR) (LPIC) (MBK) (MDN) (MLH) (MSB) (MWT) (NAME) (NDC) (NFA)
(RCVD) (RCHD) (RMB) (RMP) (RMR) (RMS) (RSP) (RSUS) (SACB) (SCA)
(TBO) (T N) (TERM) (TES) (TFO) (TRMBOPT) (3WC) (WML) (WUCR) $
```

Translations verification tools

TRAVER

The following example shows the output from translations verification (TRAVER) tools in which Network Facility Access is involved. As with other features, NFA is not directly supported by TRAVER. However, it shows routing up to the tuple in table IBNXLA. For explicit access, a message indicating that the code activates an explicit access is also generated.

Network Facility Access (continued)

TRAVER for NFA for implicit access activation or deactivation

The following TRAVER example shows implicit access activation or deactivation and shows the translations necessary to set up the NFA implicit activation or deactivation access code(s). This example is for an MDC line.

TRAVER output example for Network Facility Access for implicit access activation/deactivation

Line	Output
	>traver l 6215878 'b93' b
1	TABLE IBNLINES
2	HOST 00 0 00 1 0 DT STN IBN 6215878 IBNTST 0 0 613 $
3	TABLE DNATTRS
4	TUPLE NOT FOUND
5	TABLE DNGRPS
6	TUPLE NOT FOUND
7	TABLE NCOS
8	IBNTST 0 0 0 NFAIBN0 (XLAS CXT3 IBNXLA1 NDGT) $
9	TABLE CUSTHEAD: CUSTGRP, PRELIMXLA, CUSTXLA, FEATXLA, VACTRMT AND DIGCOL
10	TABLE DIGCOL
11	TUPLE NOT FOUND
12	Default is RPT
13	TABLE IBNXLA: XLANAME IBNXLA1
14	IBNXLA1 93 FEAT N N N NFAIMPL
15	+++ TRAVER: SUCCESSFUL CALL TRACE +++
16	Feature NFAIMPL not supported by TRAVER
17	+++ TRAVER: SUCCESSFUL CALL TRACE +++

Note: The first 'b' in the first line indicates an '*' symbol.

TRAVER for use of the AMBIG selector

The following TRAVER shows the translations necessary to allow a RES line to dial a feature access code without using the * prefix digit. This example shows use of the call forwarding programming (CFWP) feature.

TRAVER output example for Network Facility Access for use of the AMBIG selector

Line	Output
	>traver l 6210099 '72' b
1	TABLE IBNLINES
2	HOST 00 0 01 01 0 DP STN RES 6210099 0 $
3	TABLE LINEATTR
4	0 1FR NONE NT FR01 0 613 P621 L613 N TSPS N 10 NIL NILSFC LATA1 0 NIL NIL 00 Y RESGRP 0 9
5	LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
6	TABLE DNATTRS
7	TUPLE NOT FOUND
8	TABLE DNGRPS
9	TUPLE NOT FOUND
10	TABLE NCOS
11	RESGRP 0 0 0 RNCOS3 (XLAS RES1 RESXLA1 NDGT) $
12	TABLE CUSTHEAD: CUSTGRP, PRELIMXLA, CUSTXLA, FEATXLA, VACTRMT AND DIGCOL
13	RESGRP NXLA RES1 RESXLA1 0 RES
14	TABLE DIGCOL
15	RES Specified: RES digit collection
16	TABLE IBNXLA: XLANAME RES1
17	RES1 72 AMBIG RESXLA1 3 RESXLA1
18	NUMBER OF DIGITS LESS THAN OR EQUAL TO 3 RESXLA1 TRANSLATOR WILL BE USED.
19	TABLE IBNXLA: XLANAME RESXLA1
20	RESXLA1 72 FEAT N N N CFWP
21	+++ TRAVER: SUCCESSFUL CALL TRACE +++
22	SPEED CALL not supported by TRAVER
23	+++ TRAVER: SUCCESSFUL CALL TRACE +++

Network Facility Access (continued)

TRAVER for NFA for explicit access code

This TRAVER shows the translations necessary to set up an NFA explicit feature access code. This example is for a RES line.

TRAVER output example for Network Facility Access for explicit access code

Line	Output
	>traver l 6210099 'b72' b
1	TABLE IBNLINES
2	HOST 00 0 01 01 0 DP STN RES 6210099 0 $
3	TABLE LINEATTR
4	0 1FR NONE NT FR01 0 613 P621 L613 N TSPS N 10 NIL NILSFC
5	LATA1 0 NIL NIL 00 Y RESGRP 0 2
6	LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
7	TABLE DNATTRS
8	TUPLE NOT FOUND
9	TABLE DNGRPS
	TUPLE NOT FOUND
10	TABLE NCOS
11	RESGRP 0 0 0 RNCOS3 (XLAS RES1 RESXLA1 NDGT) $
12	TABLE CUSTHEAD: CUSTGRP, PRELIMXLA, CUSTXLA, FEATXLA, VACTRMT
13	AND DIGCOL
14	RESGRP NXLA RES1 RESXLA1 0 RES
15	TABLE DIGCOL
16	RES Specified: RES digit collection
17	TABLE IBNXLA: XLANAME RESXLA1
18	RESXLA1 72 FTR 2 NFAEXPL NFATG2 72
19	Invokes explicit access to NFA trunk
20	
21	+++ TRAVER: SUCCESSFUL CALL TRACE +++
	Feature NFAEXPL not supported by TRAVER
	+++ TRAVER: SUCCESSFUL CALL TRACE +++

Service orders

The data feature, NFA, is added for use on IBN or RES line class codes.

Service order limitations and restrictions

The following limitations and restrictions apply to the NFA feature.

- NFA is not compatible with the AUL option.
- NFA can only be assigned to lines with a LCC of RES or IBN.

  Note: If the RES_SO_SIMPLIFICATION office parameter is set to Y, this option can be added to 1FR and 1MR lines. This setting automatically changes the 1FR and 1MR LCC to RES LCC.

Service order prompts

The following table shows the service order prompts used to assign Network Facility Access to a line.

Service order prompts for Network Facility Access

Prompt	Valid input	Explanation
OPTION	NFA	Specifies the desired option.
USR_ID	1 to 10 digits	Specifies the user ID for a line having the NFA option added. The default is the 7-digit ANI of the line (NXX + XXXX).
IMPLCT_ ACC	Y or N	Tells whether or not the line is allowed implicit access. The default is *Y*.
IMPLCT_SC	Vector of 1 to 5 values in range *0 to 9, * or #*	Gives the implicit service code. It is only prompted for if IMPLCT_ACC is set to Y. The default is *0*.
IMPLCT_ STAT	ACT, INACT	Tells whether or not the implicit access is active. It is only prompted for if IMPLCT_ACC is set to Y. The default is *ACT*.
EXPLCT_ ACC	Y, N	Tells whether or not the line is allowed explicit access. The default is Y.
AMA_ EXPLCT	Y, N	Controls the AMA record generation following an explicit connection. The default is N.
AMA_ IPDIAL	Y, N	Controls the AMA record generation following an IP-dialed call. The default is N.
REM_ACC	Y, N	Specifies whether the line is allowed remote access. Default is N.

Network Facility Access (continued)

Example service orders for implementing Network Facility Access

The following service order example shows how Network Facility Access is added to an existing line. The default user ID is used, and implicit access is allowed but explicit access is not allowed.

Setting up Network Facility Access using ADO for implicit access

Input and response

*Input in **Prompt** mode*

```
 SERVORD:
>ado
 SONUMBER:    NOW  91  6  5  PM
>
 DN_OR_LEN:
>9915001
 OPTION:
>NFA
 USER_ID:  9915001
>
 IMPLCT_ACC: Y
>
 IMPLCT_SC:  0
>12345
 IMPLCT_STAT:  ACT
>
 EXPLCT_ACC:  Y
> N
 AMA_IPDIAL:  N
>
 REM_ACC:  N
>Y
 OPTION:
>$
```

*Input in **No-prompt** mode*

```
>ADO $ 9915001 NFA $ $ 12345 $ N  Y N $
```

Network Facility Access (continued)

The following service order example shows how Network Facility Access is added to an existing line. A user ID is entered, and implicit access is not allowed but explicit access is allowed.

Setting up Network Facility Access using ADO for explicit access

Input and response

*Input in **Prompt** mode*

```
 SERVORD:
>ado
 SONUMBER:    NOW  91  4  21  PM
>
 DN_OR_LEN:
>9915002
 OPTION:
>NFA
 USER_ID:  9915002
>111
 IMPLCT_ACC: Y
>N
 EXPLCT_ACC:  Y
>
 AMA_EXPLCT:  N
>
 AMA_IPDIAL:  N
>
 REM_ACC:  N
>
 OPTION:
>$
```

*Input in **No-prompt** mode*

```
>ADO  $ 9915002 NFA 111 N $ $  $ $ $
```

Network Facility Access (continued)

The following service order example shows how the previous line, 991-5002, (which was given explicit access) changes feature (CHF) to allow implicit access.

Setting up Network Facility Access using CHF to add implicit access

Input and response

*Input in **Prompt** mode*

```
 SERVORD:
>chf
 SONUMBER:    NOW  91  4 33  PM
>
 DN_OR_LEN:
>9915002
 OPTION:
>NFA
 USER_ID:  9915002
>111
 IMPLCT_ACC: Y
>
  IMPLCT_SC:  0
>22
 IMPLCT_STAT:  ACT
>
 EXPLCT_ACC:  Y
>
 AMA_EXPLCT:  N
>
 AMA_IPDIAL:  N
>Y
 REM_ACC:  N
>
 OPTION:
>$
```

*Input in **No-prompt** mode*

```
>CHF  $ 9915002  NFA  111  $ 22 $  $ $  Y $ $
```

Network Facility Access (continued)

The following service order example shows the addition of Network Facility Access to an existing line. The line already has the WML option. Implicit access is not compatible with WML.

Setting up Network Facility Access using ADO to add NFA to an existing line with the WML option

Input and response

*Input in **Prompt** mode*

```
 SERVORD:
>ado
 SONUMBER:    NOW  91  4  21  PM
>
 DN_OR_LEN:
>9915004
 OPTION:
>NFA
 USER_ID:  9915004
>
 IMPLCT_ACC: Y
>
 IMPLCT_SC:  0
>33
 IMPLCT_STAT:  ACT
>
 EXPLCT_ACC:  Y
>
 AMA_EXPLCT:  N
>Y
 AMA_IPDIAL:  N
>Y
 REM_ACC:  N
>
 OPTION:
>$
```

*Input in **No-prompt** mode*

```
>ADO $ 9915004 NFA $ $ $ $ $ Y Y $ $
```

Network Facility Access (continued)

Setting up Network Facility Access using ADO to add NFA to an existing line with the WML option (acceptance rejected)

Input and response

*Input in **Prompt** mode*

```
 NFA IMPLICIT ACCESS NOT COMPATIBLE WITH WML
 *** ERROR - INCONSISTENT DATA
 COMMAND AS ENTERED:
 ADO NOW 91 421 PM 9915004 ( NFA 9915004 Y 33 ACT Y Y Y)$
 ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>E
 SONUMBER:    NOW  91  4  21  PM
>
 DN_OR_LEN:  9915004
>
 OPTION:  NFA
>
 USER_ID:  9915004
>
 IMPLCT_ACC: Y
>N
 EXPLCT_ACC:  Y
>
 AMA_EXPLCT:  Y
>
 AMA_IPDIAL:  Y
>
 REM_ACC:  N
>
 OPTION:
>$
```

*Input in **No-prompt** mode*

```
>E $ $ $ $ N $ $ $ $  $
```

Network Facility Access (continued)

The following service order example shows the creation of an MDC line with the Network Facility Access option.

Setting up Network Facility Access using NEW to create an MDC line with NFA

Input and response

*Input in **Prompt** mode*

```
 SERVORD:
>new
 SONUMBER:    NOW  91  6  5  PM
>
 DN_OR_LEN:
>6216677
 LCC:
>IBN
 GROUP:
>IBNTST
 SUBGRP:
>0
 NCOS:
>0
 SNPA:
>919
 LATANAME:
>LATA1
 LTG:  0
>
 LEN_OR_LTID:
>HOST 0 0 9 3
```

-continued-

Network Facility Access (continued)

Setting up Network Facility Access using NEW to create an MDC line with NFA (continued)

Input and response

```
 OPTION:
>NFA
 USER_ID:  6216677
>9196216677
 IMPLCT_ACC: Y
>
 IMPLCT_SC: 0
>12345
 IMPLCT_STAT: ACT
>
 EXPLCT_ACC:  Y
>N
 AMA_IPDIAL:  N
>Y
 REM_ACC:  N
>
 OPTION:
>$
```

*Input in **No-prompt** mode*

```
>NEW  $ 6216677  IBN  IBNTST  0  0  LATA1  $
    HOST 00 0 09 03  NFA  9196216677  $  12345  $  N  Y  $  $
```

End

Network Facility Access (end)

The following service order example shows how to change the LCC of the previous line, 621-6677, to 1FR ,with RES_SO_SIMPLIFICATION field RES_AS_POTS set to Y.

Setting up Network Facility Access using the CHG command to change LCC to 1FR

Input and response

*Input in **Prompt** mode*

```
 SERVORD:
>chg
 SONUMBER:    NOW  91  6 5  PM
>
 WHAT:
>LINE
 DN_OR_LEN:
>6216677
 LINE_INFO:
>LCC
 NEW_LCC:
>1FR
```

*Input in **No-prompt** mode*

```
>CHG  $ LINE 6216677  LCC  1FR
```

NFA: Remote Access, Flash Processing

Feature name

NFA: Remote Access, Flash Processing

Feature number

NC0497

Feature package

NTXR25AA

BCS applicability

BCS35 and up

Description

The NFA: Remote Access, Flash Processing feature enhances the functionality of NFA by adding four new capabilities: the ability to access an NFA trunk from other locations in addition to the subscribers base telephone line, the ability to place a connection to an NFA trunk on hold whenever the subscriber flashes from his or her line, the ability to extend dial pulse (DP) to DTMF conversion through the entire life of a call dialed by an IP, and the introduction of an extra inverted wink into the NFA trunk signaling protocol.

Remote access to an NFA trunk

A remote connection to an NFA trunk can be initiated by placing a call to a number which has been established for direct inward system access (DISA). If the network facility remote access (NFRA) option has been assigned to the DISA directory number (DN) and is activated, the subscriber is prompted to enter his or her home telephone number followed by a personal identification number (PIN). If the subscriber has been authorized for remote access to an NFA trunk, a remote connection is established using the NFA trunk by outpulsing the remote access service code datafilled for the customer group along with the subscribers user ID. The originator then has access to the IP functionality which is compatible with a remote access, such as having the IP place a call to a routing DN for the subscriber.

Flash processing enhancements

The second area of development for this feature enhances the NFA trunk signaling protocol to allow an explicit or remote NFA trunk connection to be placed on hold. If the subscribers line has been assigned flash capability, the subscriber can place an explicit NFA trunk connection on hold or remove it from hold by entering a flash from the telephone set. The flash is propagated on the NFA trunk to the IP whenever this is done.

In addition, the NFA flash processing enhancements also provide for an implicit NFA connection to the IP following a flash from the subscribers line. This implicit access can be used to dial either a directory number or a feature access code for the subscriber. The implicit access is provided in situations where the subscriber is required to dial digits from his or her telephone line.

Extended DP to DTMF conversion

Base DP to DTMF conversion was designed by NFA in BCS34 to convert dial pulses from the subscribers DP telephone set to DTMF tones before propagating them over an NFA trunk. However, this capability was only in effect while the NFA trunk was connected to the call. The third part of this feature implements a new form of DP to DTMF conversion called extended conversion. This form of conversion is available only for explicit NFA trunk connections which are initiated by entering an explicit NFA feature activation code that has been assigned the extended conversion option. Whenever extended conversion is activated on an explicit connection to an NFA trunk, it remains in effect throughout both the explicit connection and any call that the IP might dial for the subscriber.

Inverted wink protocol change

The fourth part of this feature involves adding an inverted wink to the NFA trunk signaling protocol. This inverted wink is sent on the NFA trunk from the DMS switch to the IP as soon as cut-through has occurred in order to give the IP a positive indication that it can begin interacting with the subscriber. The inverted wink is incorporated into the protocol for explicit, implicit, and remote NFA trunk connections.

Theory of operation

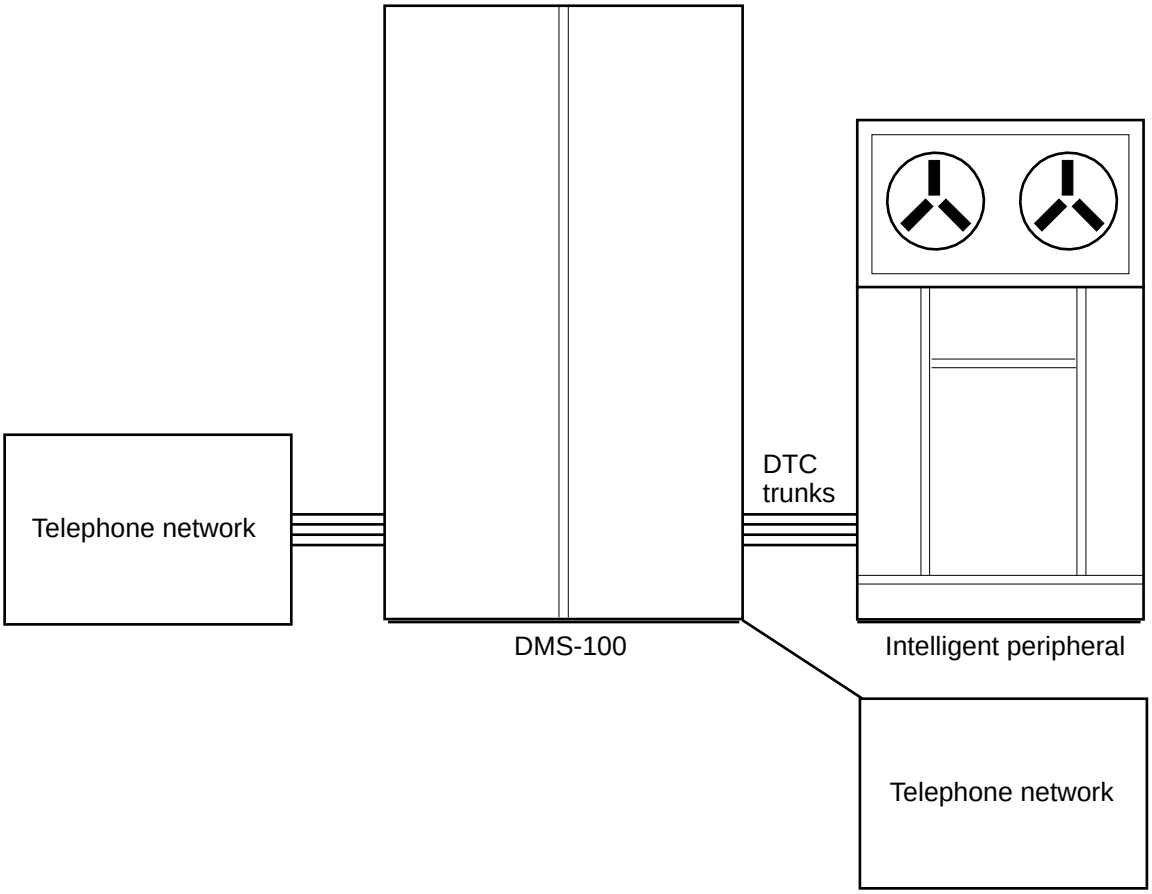
A description of how NFA: Remote Access, Flash Processing works is detailed in the following information.

NFA: Remote Access, Flash Processing (continued)

Figure 3-7
NFA Remote Access

Switch provides:

- DISA-type interface to NFA
- Prompts the user to enter their home telephone number and PIN
- Remote connection to the IP upon successful validation
- Remote access service code and the subscribers ID are outpulsed to the IP using DTMF signaling
- An IP that may extend a call to a routing DN for the subscriber



NFA: Remote Access, Flash Processing (continued)

Remote access to an NFA trunk

An NFA subscriber who has been assigned remote access capabilities can use the following process to initiate a remote connection to an NFA trunk.

1 The subscriber begins a remote session by dialing a DISA DN which has been assigned the NFRA DISA option. When the call terminates to this DN, one of the following occurs:

   a. If NFRA is the only remote DISA feature assigned to the DISA DN, the feature is activated automatically. The subscriber proceeds to step 2.

   b. If more than one remote DISA feature has been assigned to the DISA DN, the subscriber is prompted by a digital recorded announcement machine (DRAM) announcement to enter the access code of the feature they want to activate. To activate NFRA, the subscriber must enter the NFRA access code, which has been datafilled in table IBNXLA. The NFRA access code is translated using the customer group, subgroup, and network class of service (NCOS) specified for the DISA DN.

2 The subscriber is prompted by a DRAM announcement to enter the subscribers home telephone number followed by the PIN. The subscriber is given one attempt to enter a valid telephone number and PIN combination as a single digit stream. The end of dialing is indicated either by an octothorpe number or by the expiration of inter-digital timeout.

The customer group, subgroup, and NCOS specified for the DISA DN are used to translate the telephone number entered by the subscriber in order to determine if NFRA has been assigned to that line. The number of digits required for this translation must be specified in the CUSTSTN tuple for the customer group. If a valid telephone number and PIN are not entered, the call is routed to treatment. If the DRAM announcement is not properly datafilled or if an announcement channel is not available, the call is sent to treatment.

Remote access to an NFA trunk can only be activated by a subscriber who has specified a unique DN. If the DN entered by the subscriber translates to a distributed line hunt (DLH) or multiline hunt (MLH) group, then remote access capability must be assigned to the pilot of the group and the subscriber must enter the PIN that is datafilled for the pilot. The subscriber is not allowed to dial any number that translates to a non-unique DN, such as a multiple appearance directory number (MADN) group DN.

The subscriber is unable to enter a flash from the telephone set while connected to the DRAM announcement. If the line has been assigned flash

NFA: Remote Access, Flash Processing (continued)

capabilities, a flash can be entered as soon as an octothorpe has been entered or inter-digital timeout has expired.

3 If a valid telephone number and PIN combination are entered, the DMS switch attempts to establish a remote connection between the subscriber and an NFA trunk. This connection is accomplished using the same messaging protocol that is used for NFA explicit connections. First, the DMS switch seizes an idle member from the trunk group specified in the customer groups CUSTSTN tuple along with the subscribers ID and waits for the call to be answered.

If NFA trunk resources are not available to connect the subscriber to an NFA trunk, the call receives the same treatment as specified in the protocol for a regular explicit connection.

4 The IP sends answer supervision back on the NFA trunk to the DMS switch and the connection is completed. If the IP fails to answer within the specified time datafilled in the trunks group data, the trunk connection is dropped and the subscriber is sent to treatment. If the subscriber goes on-hook at any point during this process, the DMS switch disconnects the NFA trunk and takes down the call. As soon as cut-through occurs, an inverted wink is sent by the DMS switch on the NFA trunk.

5 At this point, a stable call is established between the remote subscriber and the IP. No DP to DTMF conversion is provided. The call between the remote subscriber and the NFA trunk remains in place until one of the following events occur:

a. The subscriber flashes. This can occur if the line being used by the subscriber has been assigned flash capability. If the subscriber flashes and the line being used is on the same switch as the DISA DN, the flash is handled as specified in the "Flash processing enhancements" section on page 3-79. If the subscribers line is on a different switch in the network, the terminating switch with the DISA DN is not aware of the action, since the flash is not propagated through the network. The connection between the NFA trunk from the terminating office and the IP remains in place.

b. The subscriber goes on-hook. If this occurs, the call is disconnected. An automatic message accounting (AMA) record can be generated, if datafilled, to record the remote connection that was established between the subscriber and the NFA trunk.

c. The IP goes on-hook. If this occurs, the leg of the call between the subscriber and the NFA trunk is disconnected. An AMA record can be generated, if datafilled, to record the remote connection that was established between the subscriber and the NFA trunk.

d. The IP returns an inverted wink. This indicates that the IP intends to dial a routing number for the subscriber. At this point, the DMS switch receives digits from the IP as specified in the existing protocol for IP dialing. Once the end of digits indication is received, the NFA trunk connection to the IP is disconnected and an AMA record can be generated, if datafilled, to record the remote connection that was established between the subscriber and the IP.

If the digits transmitted by the IP are received properly, the DMS switch translates them using the customer's dialing plan to determine whether or not the IP has attempted to dial a feature access code. If the digits indicate a feature access code, then the DMS switch sends the call to FEATURE_NOT_ALLOWED (FNAL) treatment. If the digits can translate to a regular line or trunk connection, then the DMS switch attempts to place the call as if the subscriber had dialed the digits from the subscribers home telephone line.

As soon as the digits received from the IP are dialed, the subscriber is removed from hold and reconnected to the call. One of the following events occurs:

- The call terminates to some type of treatment (busy, reorder, etc.). The subscriber is sent to the specified treatment.
- The call terminates but is never answered. The subscriber receives ringing and is required to go on-hook before further actions can be taken.
- The call terminates and is answered. A stable call is established between the remote NFA user and the called party. This call remains up until one or the other of these parties goes on-hook. When this occurs, this leg of the call is disconnected.

Flash processing enhancements

NFA trunk on hold

NFRA enhances the protocol to allow a subscriber flash to be propagated on the NFA trunk to the IP while it is connected to the call. This functionality allows the user to place either an explicit or remote NFA trunk connection on hold while activating another feature such as call waiting (CWT) or three-way calling (3WC). While the IP is on hold, the DMS switch does not recognize any signaling from the IP on the NFA trunk other than an on-hook signal.

NFA: Remote Access, Flash Processing (continued)

A subscriber can place an NFA trunk connection on hold if assigned flash capabilities and if involved in either an explicit NFA connection or a remote NFA connection from a line on the same switch as the subscribers home telephone line. If these requirements are met, the subscriber may enter a flash from the telephone set in order to activate another feature. One of the following actions can take place:

- If the flash places the NFA trunk connection on hold, then the flash is propagated to the IP according to LSSGR standards. This functionality can occur if the subscriber is connected to the IP and flashes to initiate the second leg of a three-way call. While the NFA trunk connection is on hold, the DMS switch ignores any inverted winks that are received on the trunk. The only signaling that the DMS switch recognizes from the NFA trunk is an on-hook signal. If an on-hook signal is received, the NFA trunk is idled and that leg of the call is disconnected. An AMA record can be generated, if datafilled, to record the connection to the NFA trunk.

  If the NFA trunk connection is a remote access to a different office other than the one that serves the originator, then a flash is not propagated on the NFA trunk to the IP. This functionality is because the flash from the originating office is not propagated through the network to the NFA office. In this scenario, the NFA trunk is not aware that the originator has placed it on hold.
- If the flash removes the NFA trunk connection from hold, then the trunk is reconnected to the call. This functionality can occur if the subscriber has placed the NFA trunk on hold in order for CWT to be activated and now wishes to reconnect to the first call leg with the IP. If the flash removes the NFA trunk from hold, the flash is propagated on the NFA trunk to the IP.

  If the NFA trunk connection is a remote access to a different office other than the one that serves the originator, then a flash is not propagated on the NFA trunk to the IP. This functionality is because the flash from the originating office is not propagated through the network to the NFA office. In this scenario, the NFA trunk is not aware that the originator has placed it on hold.
- If the flash drops the connection to the NFA trunk, then the leg of the call with the NFA trunk is disconnected. This functionality can occur if the subscriber has an active three-way call in progress with the NFA trunk on the second leg and flashes to disconnect the second leg. When this occurs, an on-hook signal is sent on the NFA trunk to the IP. An AMA record can be generated, if datafilled, to record the connection to the NFA trunk.

- If the flash does not alter the state of the NFA trunk connection, then it is not propagated on the NFA trunk to the IP. This functionality can occur if the subscriber has just initiated an explicit connection to an NFA trunk on the second leg of a three-way call. The next flash entered by the subscriber conferences the first and second legs together. However, the second leg of the call is not put on hold as a result of this action, and a flash is not propagated on the NFA trunk to the IP.

Implicit access on the second leg of 3WC

This feature provides the ability to access the NFA trunk on the second leg of a three-way call. Previously, only explicit access was allowed on the second leg.

After a flash to initiate the second leg of a three-way call, a subscriber with active implicit access is implicitly connected to the NFA trunk. The normal implicit access protocol applies in this scenario, which includes the ability for the trunk to dial a call for the subscriber. The following two differences exist between implicit functionality on the first leg of a call and implicit functionality on the second leg:

- Since stuttered dial tone is never supplied on the second leg of a three-way call, the aspects of the implicit protocol concerning stuttered dial tone do not apply (for example, no stuttered dial tone service code).
- If an implicit connection on the second leg of a call is not answered before the subscriber dials digits, recall dial tone is returned to the subscriber. This functionality also occurs if an answered implicit connection on the second leg disconnects before the NFA trunk dials digits. In either case, the ROH timer is reset for the subscriber.

The functionality of the following features is supported by NFA implicit following a flash entered by the subscriber. This functionality is subject to the existing flash handling capabilities of each individual feature.

- Account Code feature

A subscriber with Account Code feature (ACCT) can flash to enter the account code feature activation code followed by the subscribers account code. The resulting implicit connection from the flash is used to dial the account code feature activation code. Upon receiving recall dial tone, the subscriber must then dial the account code.

NFA: Remote Access, Flash Processing (continued)

- Authorization Code feature

When a subscriber with Authorization Code feature (AUTH) enters a flash, the authorization code feature's activation code is entered followed by the authorization code. After the code is verified, the subscriber dials the DN of the party for the second leg of the call. The implicit access that results is used to dial the authorization code feature's activation code. Upon receiving recall dial tone, the subscriber must then dial the authorization code and the DN of the party for the second leg.

The AUTH and ACCT features can be configured so that an account code must be entered following the authorization code. In this scenario, the subscriber enters the authorization code feature's activation code following the flash. At this point, recall dial tone is received and the subscriber enters the authorization code and the account code. Once this is verified, the subscriber dials the DN of the party for the second leg of the call. The implicit access that results from the flash can be used to dial the authorization code feature's activation code. Upon receiving recall dial tone, the subscriber must then dial the authorization code, account code, and the DN of the party for the second leg.

- Automatic Call Back (ACB) feature

If the subscriber dials a party that is busy, he or she may flash to dial the ACB activation code. The implicit connection that results from the flash can be used to dial the ACB feature activation code.

- Speed Call (SC) feature

When a subscriber with the Speed Call feature enters a flash, a cell identifier can be entered that will cause the digits programmed in the speed call cell to be dialed. The implicit access that results from the flash can be used to dial the speed call cell identifier.

- Call Hold (CHD)
- Call Pickup (CPU)
- Call Request Activation (Message Waiting) (CRA)
- Call Transfer (CXR)
- Call Waiting Origination (CWO)
- Cancel Call Waiting (CCW)
- Executive Busy Override (EBO)
- Group Intercom (GIC)
- Last Number Redial (LNR)
- Meet-Me Conference (MMC)
- Pre-set Conference (PSC)

- Ring Again (RAG)
- Station Controlled Conference (SCC)
- Three Way Calling (3WC)

The functionality of the following features is not supported following a flash. Therefore, the functionality is also not supported by implicit access following a flash. If an attempt is made to enter any of the following feature activation codes, the call routes to treatment.

- Call Forwarding (CFW)
- Customer Originated Trace (COT)
- Call Request Retrieve (Message Waiting) (CRR)
- Directed Call Pickup with Barge In (DCBI)
- Directed Call Pickup - Non Barge In (DCPU)
- Speed Call Programming (SC)
- Automatic Redial (AR)

The following features only apply to call terminations; therefore, they are not applicable to NFA implicit activation following a flash:

- Calling Name Delivery (CNAMD)
- Calling Number Delivery (CND)
- Call Waiting (CWT)

Conferencing with explicit access on second leg of 3WC

In the BCS34 version of NFA, if the subscriber dialed an explicit access to the NFA trunk on the second leg of a three-way call and wished to flash to conference back to the first party, the subscriber had to wait until the NFA trunk returned answer supervision before doing so. This feature provides functionality that allows the subscriber to flash and conference the first party back into the call immediately after the NFA trunk has been seized.

> ***Note:*** This functionality only applies if the first party is not an NFA trunk, because a single subscriber may not conference two NFA connections together.

Extended DP to DTMF conversion

This feature implements a new type of DP to DTMF conversion called extended conversion which coexists with the existing implementation of DP to DTMF conversion, referred to as base conversion. The primary advantage of extended conversion is that it remains active not only while the subscriber is connected to the NFA trunk, but also during any call the IP might extend for the subscriber. With base conversion, the DP to DTMF conversion is only active while the subscriber is connected to the NFA trunk.

NFA: Remote Access, Flash Processing (continued)

A new subfield is added to each NFA explicit access code tuple in table IBNXLA that specifies whether or not extended conversion is to take place. If this field is set to Y, then extended conversion will occur on all NFA calls initiated by dialing that explicit access code. If this subfield is set to N, then the existing implementation of DP to DTMF conversion applies during explicit NFA connections initiated with that access code.

Note: Neither form of DP to DTMF conversion applies to implicit or remote NFA connections.

The following figure shows a tuple from table IBNXLA for an NFA explicit access code with extended conversion activated.

Datafill example for table IBNXLA

Example of a MAP display

```
KEY                                                    RESULT

IBNXLA1      78      FTR  2 NFAEXPL TRKGP1 54321 Y
```

If the EXT_CONV subfield is set to Y, then the subscriber hears the tone that is generated by the DP dialing. The tone begins as soon as the connection to the NFA trunk is established and continues while the NFA trunk is involved in the call as well as during any call that is extended for the subscriber.

The tone is generated following each DP digit after it has been outpulsed. This tone is both audible and recognizable to any parties that may be conferenced to the call. If the subscriber dials an explicit access code which has been assigned extended conversion, then extended conversion starts as soon as answer is received on the NFA trunk. If that subscriber then flashes to place the NFA trunk connection on hold and initiates a three-way call, then extended conversion continues to take place on the second leg of the three-way call.

If the EXT_CONV subfield is set to N, then the subscriber does not hear the tone that is generated by the DP dialing. This functionality is provided by base conversion in BCS34.

In instances where an explicit NFA connection extends a call to another explicit NFA connection, the type of DP to DTMF conversion in effect depends on the datafill for the table IBNXLA explicit access code used in the most recent access. For example, if line A dials an explicit access code with EXT_CONV set to Y, then extended DP to DTMF conversion is initiated. If the NFA trunk then dials a different explicit access code for the

subscriber that has EXT_CONV set to N, then extended DP to DTMF conversion ceases and regular DP to DTMF conversion is initiated.

Once extended conversion is initiated, it remains in effect until it is either deactivated by an additional explicit access (with EXT_CONV set to N as described in the preceding paragraph) or until the subscriber disconnects from the call. This functionality implies that extended conversion is in effect during calls extended by the IP as well as other call legs that are initiated. If extended conversion is activated for a subscriber and they access a feature requiring further digit collection, DP digits are echoed by their DTMF equivalents, possibly resulting in double digit dialing.

As previously mentioned, if an explicit connection using extended conversion is put on hold by a user flash, extended conversion continues on the second call leg. If that call leg then activates an explicit connection that uses normal conversion (feature NC0418), the extended conversion ends. If the user then flashes again, thus dropping the normal connection and removing the extended connection from hold, extended conversion resumes.

> ***Note:*** Extended conversion is only resumed in this manner if an explicit connection to the NFA trunk is being brought off from hold. If an extended call to some other agent is being brought off from hold, extended conversion (if previously stopped) will not be restarted.

The NFA line itself may be put on hold while extended conversion is in progress, either due to another lines flashing (in a 3WC scenario, for example), or due to the trunk extending a call for the line. At such time, if the subscriber enters a DP digit, they hear the converted tone, but it is not transmitted to any other agent.

If DP to DTMF conversion takes place while the subscriber is connected by an explicit connection to an NFA trunk, the AMA record that is generated for the connection has its CONV REQ field set to two. This functionality indicates that DP to DTMF conversion was performed during the explicit connection. If DP to DTMF conversion does not occur while the explicit connection to the NFA trunk is in place, then the CONV REQ field in the AMA record is set to one, even if conversion is performed later during the call extension.

Inverted wink protocol change

This feature incorporates an extra inverted wink into the trunk signaling protocol that is used in implicit, explicit, and remote NFA connections. This extra inverted wink is delivered to the IP on the NFA trunk after the IP has answered the call and cut-through has occurred. The duration of the

NFA: Remote Access, Flash Processing (continued)

inverted wink is approximately 100 ms, depending on the switch load at the time.

Customized announcements

NFRA uses a recorded DRAM announcement to prompt for the subscribers home telephone number and PIN. This DRAM announcement is required and must be custom recorded by the operating company. In addition, a recorded announcement that prompts for a remote DISA feature access code is required if more than one remote DISA feature is assigned to a DISA DN.

Customized announcements are recorded on an NT1X77 random access memory (RAM) or NT1X79 electrically erasable programmable read-only memory (EEPROM) card using the DRAMREC utility. The phrases are then datafilled in table DRMUSERS in the same way as prerecorded announcements.

The following announcement text is suggested:

1 *Please enter a code to remotely access a feature*.

This interruptible announcement is provided by the DISA feature to allow a common remote access interface for all remote access features. If the DISA DN is dedicated to one remote access feature, this announcement is not given. (An interruptible announcement replaces dial tone; thus, digits are accepted at any point during the announcement text.) This announcement is datafilled as a standard announcement in tables ANNS, ANNMEMS, DRAMTRK, and CUSTHEAD.

2 *Please enter your x digit telephone number, followed by your PIN number*.

This interruptible announcement is specific to NFRA. It is composed of phrases that form the announcement. This announcement plays once and allows the subscriber one opportunity to enter a valid combination of home telephone number and PIN.

The following tables must be datafilled in order to use these announcements.

Table CLLI

The CLLI names for the DISA and NFRA announcements are defined in this table. The TRKGRPSIZ field indicates the maximum number of simultaneous users of the announcement and should be set depending on the office engineering for DRAM announcements. In this example, a value of 15 was selected arbitrarily.

Datafill example for table CLLI

Example of a MAP display

CLLI	ADNUM	TRKGRSIZ	ADMININF
DISARAC	353	15	DISA_ANNOUNCEMENT
NFRAANN	354	15	NFRA_ANNOUNCEMENT

Table ANNS

The DISA announcement is a standard announcement and should be datafilled as announcement type STND (standard). The NFRA announcement should be defined as announcement type NFRA. The MAXCON field specifies how many callers can hear the announcement at a time. The CYTIME field indicates the length of each announcement cycle or is set to 0 for flexible announcements datafilled in DRMUSERS. The MAXCYC field indicates the number of times the announcement plays during each cycle.

Datafill example for table ANNS

Example of a MAP display

CLLI	ANTYPE	TRAFSNO	MAXCONN	CYTIME	MAXCYC
NFRAANN	NFRA	23	15	0	1
DISARAC	STND	23	15	12	1

Table ANNMEMS

The announcement channels are defined for use. NFRA uses unilingual announcements, so one track is sufficient. Each announcement must have a tuple for each announcement trunk member. (The phrase content of the DISA announcement is defined in table DRAMTRK. The phrase content of the NFRA announcement is defined in table DRMUSERS.)

NFA: Remote Access, Flash Processing (continued)

Datafill example for table ANNMEMS

Example of a MAP display

```
ANNMEM       HDWTYPE CARD                          MEMINFO
-------------------------------------------------------------
DISARAC  0     DRAM  DRA                  (0  MTM 1 5)$

DISARAC 14     DRAM  DRA                 (0  MTM 1 19)$

NFRAANN  0     DRAM  DRA                 (0  MTM 2 15)$

NFRAANN 14     DRAM  DRA                 (0  MTM 2 29)$
```

Table DRAMS

The DRAM memory cards that store the announcement phrases are specified in this table. The table is arranged with each NT1X75BA DRAM controller card followed by the 1 to 8 memory cards that it controls. The NT1X75BA controller card should be used for the DRAM when custom recorded announcements are used. The controller and all of its memory cards must be on the same MTM shelf. The following example shows use of the NT1X79AA EEPROM DRAM memory card.

Switch settings on the DRAM memory cards indicate the DRAM virtual card number to the DRAM controller card. The TMCKT field in table DRAMS is the DRAM virtual card number.

Datafill example for table DRAMS

Example of a MAP display

```
DRAMCARD TMTYPE TMNO TMCKT CARDCODE CARDINFO
-------------------------------------------------------------
0        MTM     1     0   1X75BA   CTLR DRAM0$

1        MTM     1     2   1X79AA   EEPROM (0)$
```

The DRAMREC command ASSIGNDUMP determines the DRAM commands used to reassign PROM phrases after DMS-100 switch image booting. These commands can then be added to the profile executed by the operator during system initialization.

See *Digital Recorded Announcement Machine DRAM and EDRAM Guide*, 297-1001-527, for further information on the DRAM recording utility.

The operating company should record the NFRA announcement phrases using the DRAMREC facility. See *Digital Recorded Announcement*

Machine Administration Guide, 297-1001-316, for further information on the DRAMREC.

The following phrases are required for this feature. The exact wording can be modified at the discretion of the operating company. The phrase "SILENCE" is required to internally pad each announcement. This phrase can be as short as one second. The phrases "NFRAEDNPIN1" and "NFRAEDNPIN2" must be recorded in order for this feature to function. The digit phrases are required if the number of digits in the home telephone number is to be included in the message.

- SILENCE — one second of silence
- NFRAEDNPIN1 — "Please enter your"
- NFRAEDNPIN2 — "telephone number followed by your PIN number"
- NFRAEONEDIGIT — "one digit"
- NFRAETWODIGIT — "two digit"
- NFRAETHREEDIGIT — "three digit"
- NFRAEFOURDIGIT — "four digit"
- NFRAEFIVEDIGIT — "five digit"
- NFRAESIXDIGIT — "six digit"
- NFRAESEVENDIGIT — "seven digit"
- NFRAEEIGHTDIGIT — "eight digit"
- NFRANINEDIGIT — "nine digit"
- NFRAETENDIGIT — "ten digit"

Table DRMUSERS

This table indicates the phrase list that is used to construct the NFRA announcement. Phrases NFRAEDNPIN1 and NFRAEDNPIN2 correspond to the phrases recorded using the DRAMREC facility. Phrase NFRAEDIGITS will correspond to the phrase "X digit", where X is specified by the NUMDIGS field in the NFRA tuple for the customer group in table CUSTSTN. If the operating company does not wish to provide the number of digits required to dial the base station, the phrase NFRAEDIGITS may be omitted.

NFA: Remote Access, Flash Processing (continued)

Datafill example for table DRMUSERS

Example of a MAP display

```
USERANN                                        PHSLIST
-------------------------------------------------------

NFRAANN     1     (NFRAEDNPIN1)
                  (NFRAEDIGITS) (NFRAEDNPIN2)$
```

Table DRAMTRK

This table indicates the phrase that is used for a standard announcement. A tuple is only required in this table if the DISA announcement that prompts for a feature access code is required. This example assumes that the phrase DISAPHRASE has been recorded.

Datafill example for table DRAMTRK

Example of a MAP display

```
ANNTRACK                PHSLIST
-------------------------------------------------------

DISARAC  0            DISAPHRASE $
```

Translations table flow

The NFRA translations process is shown in the flowchart that follows. The flowchart shows the table flow for programming NFA from a remote set. In this example, the IP is used to extend a call for the subscriber.

Table DNROUTE lists information for writable DNs in the switch, such as a DN that identifies a route instead of a line equipment number (LEN). The DISA DN used in the flowchart that follows is defined in table DNROUTE. NFRA must be assigned to the DN.

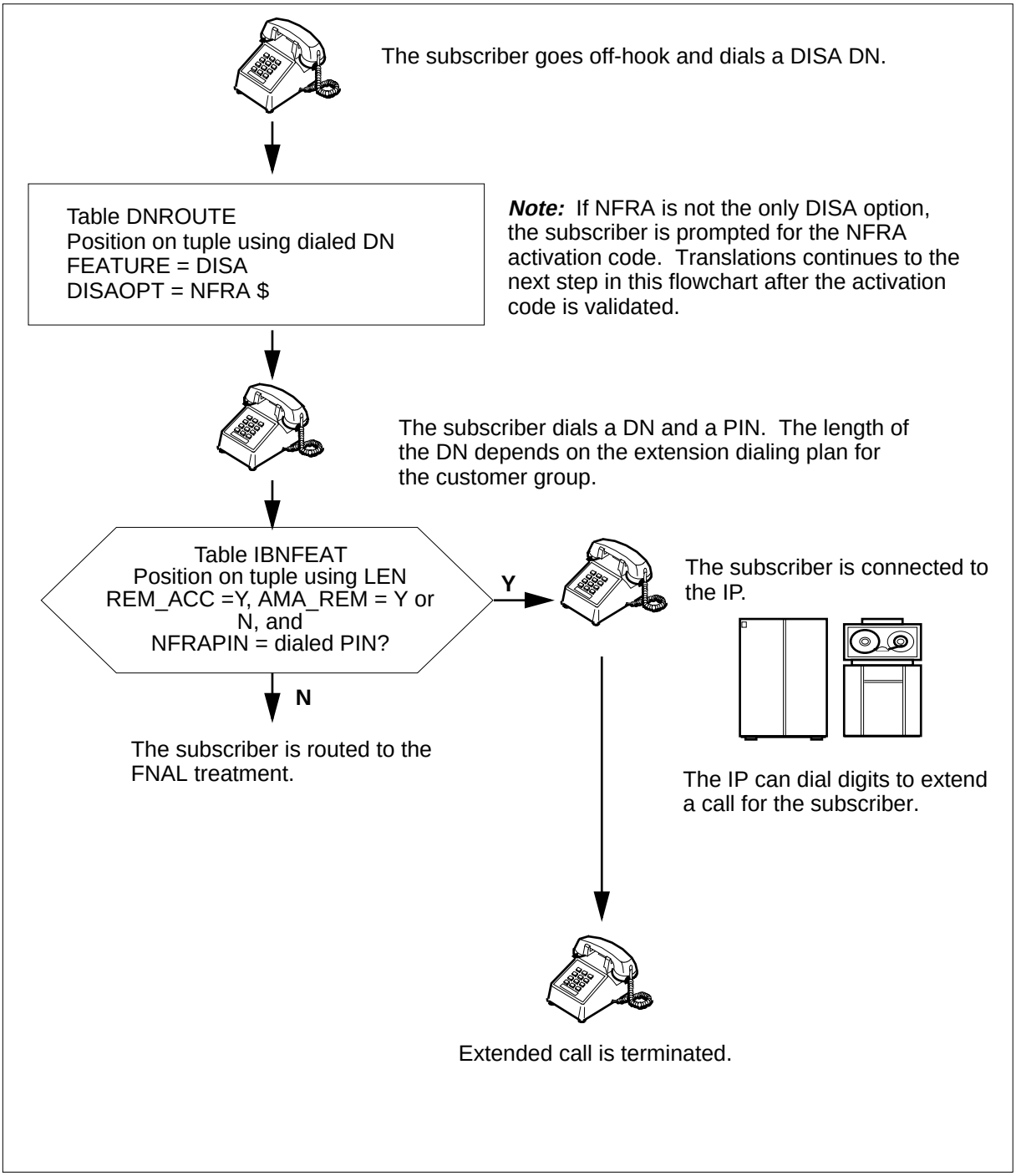
Table IBNFEAT lists the features assigned to a LEN.

Table CUSTSTN contains the station options assigned to a customer group. Datafill in this table determines the number of digits that can be entered for the subscribers DN, the name of the remote trunk group, and the remote service code.

NFA: Remote Access, Flash Processing (continued)

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

Figure 3-8
Translations data flow for NFRA



NFA: Remote Access, Flash Processing (continued)

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

Datafill example for NFA: Remote Access, Flash Processing	
Item	**Example data**
DISA DN	621-1000
LEN of subscriber	HOST 00 02 0 05
Datafill table	**Example data**
DNROUTE	613 621 1000 FEAT DISA RESGRP 0 N N N Y (NFRA) (NCOSOPT 0) $
IBNFEAT	HOST 00 0 09 07 0 NFA NFA 6211233 Y 33 INACT Y N N Y Y 654321 $
CUSTSTN	IBNTST NFRA NFRA NFRATKGP 9999 7

Feature limitations and restrictions

The following limitations and restrictions apply to NFA: Remote Access, Flash Processing.

Remote access to an NFA trunk

- The IP is only allowed to dial routing DNs for a subscriber that has accessed the IP using a remote connection. The IP is not allowed to dial any feature activation codes for a remote originator, including speed call activations and IBNXLA features.
- The remote subscriber must enter a DN that uniquely identifies the line. A remote subscriber cannot access a PIN stored for a member of a MADN group. A remote subscriber cannot access a PIN stored for a member of a DLH or MLH group. The subscriber must enter the PIN assigned to the pilot of these hunt groups in order to initiate a remote connection.

NFA flash processing

- The subscriber can flash and place an explicit or remote NFA trunk connection on hold if the trunk connection has been answered by the IP.
- A single subscriber is not allowed to conference together more than one connection to an NFA trunk. If an attempt is made, the second NFA trunk connection is dropped.

DP to DTMF conversion

- The DP conversion process, whether normal or extended conversion, does not survive over an XMS-based peripheral module (XPM) warm switch of activity (SWACT). An established call will survive, but attempts by the subscriber to dial a dial pulse digit will not result in a DTMF tone.

Feature interactions

The NFA: Remote Access, Flash Processing feature interacts with the features described in the following paragraphs.

Three-way calling and explicit NFA connections

Whenever an explicit NFA connection attempts to extend a call for the subscriber while it is involved in a three-way call, the new party, being the last to join the conference, is added on the second leg of the three-way call. The other party in the three-way call is then placed on the first leg.

For example, party A establishes a three-way call with an NFA explicit trunk connection on the first leg and party B on the second leg. When the NFA trunk indicates that it intends to extend a call, party B is transferred to the first leg of the call and placed on hold while the DMS switch extends the call to party C on the second leg. Party A is now connected to a two-party call with party C. When party A flashes again, a three-way call is formed with party B on the first leg and party C on the second leg. If party A flashes again at this point, party C is dropped from the call and a two-way call is reestablished between A and B (according to existing three-way call functionality).

As another example, party A establishes a three-way call with party B on the first leg and an NFA explicit trunk connection on the second leg. When the NFA trunk indicates that it intends to extend a call, party B is placed on hold while the DMS switch extends the call to party C on the second leg. Party A is now connected to a two-party call with party C. When party A flashes again, a three-party call is formed with party B on the first leg and party C on the second leg. If party A flashes again at this point, party C is dropped from the call and a two-way call is reestablished between A and B (according to existing three-way call functionality).

Three-way calling and remote NFA connections

NFRA is allowed on either leg of a three-way call. Whenever a remote NFA connection attempts to extend a call for the subscriber while it is involved in a three-way call, the new party replaces the NFA remote connection on whichever leg of the call in which it was involved. The state of the three-way call and the state of the other party's connection is not changed. This provides a consistent interface on remote NFA connections, where the connection is established from the local office or from a remote office.

NFA: Remote Access, Flash Processing (continued)

For example, party A establishes a three-way call with a remote NFA trunk connection on the first leg and party B on the second leg. When the NFA trunk indicates that it intends to extend a call to party C, party C is placed on the first leg of the three-way call, and audible ringing is heard by both parties A and B. The state of the call remains as a three-way conference; therefore, party A does not need to enter a flash in order to reform the conference. If party A does flash at this point, party B is dropped from the second leg of the call and a two-way call is reestablished between A and C (according to existing three-way call functionality). This functionality is the same regardless of whether the remote NFA connection is in the same office as party A or in a different office.

As another example, party A establishes a three-way call with party B on the first leg and a remote NFA trunk connection on the second leg. When the NFA trunk indicates that it intends to extend a call to party C, party C is placed on the second leg of the three-way call and audible ringing is heard by both parties A and B. The state of the call remains as a three-way conference, so party A does not need to enter a flash in order to reform the conference. If party A does flash at this point, party C is dropped from the second leg of the call, and a two-way call is reestablished between A and B (according to existing three-way call functionality). This functionality is the same regardless of whether the remote NFA connection is in the same office as party A or in a different office.

Flash restrictions

The flash processing capability of NFA allows NFA trunk connections to the IP to be placed on hold. This capability provides a consistent interface for any features that cause a party involved in the call to be placed on hold. However, whenever an NFA trunk has been placed on hold, the DMS switch ignores all signaling received from the NFA trunk except for an on-hook.

Three-way calling

A single subscriber is not allowed to conference two NFA trunk connections together. If an attempt is made, the second NFA trunk connection is dropped.

The subscriber is not allowed to transfer a connection to an NFA trunk to another party.

It is possible to establish a call that includes two NFA trunk connections through the use of call chaining. For example, if party A and party B both have NFA and three-way calling, it is possible for party A to call party B. This connection can be followed by both parties A and B adding an explicit NFA connection to their respective second call legs. When A and B are conferenced together, the call chain will include two NFA trunk connections.

It is also possible to establish a call that includes two NFA trunk connections, if either of the connections is a remote access to an NFA trunk in another office. For example, party A dials an explicit NFA connection and flashes to place the connection on hold. Then, party A dials an NFRA DISA number in another office, enters a valid DN and PIN combination to establish a remote connection, and at this point, flashes to form a three-way call between the two trunk connections.

Call Transfer

The subscriber is not allowed to transfer a connection to an NFA trunk to another party. This restriction applies to explicit NFA connections and to remote NFA connections in the same office as the subscriber. It is possible to transfer a remote NFA connection to a different office from the originator. For example, party A forms a three-way call between party B and a remote NFA connection in a different office. (The remote NFA connection was established by dialing an NFRA DISA DN associated with an office other than party A's office). If call transfer capabilities have been assigned, party A can transfer party B to the remote NFA connection. The AMA records generated for any calls that are extended by the remote NFA connection use the DN associated with the PIN that was used to establish the connection as the originating DN.

NFA: Remote Access, Flash Processing (continued)

Activation/deactivation by the end user

To activate NFRA from a remote station, a subscriber must follow the steps listed below.

Activation of NFRA

Step	Action	Response
1	Go off-hook.	Receive dial tone.
2	Dial a DISA directory number DN to the office serving the NFRA subscriber set.	If NFRA is the only remote DISA feature assigned to the DISA DN, the feature is activated automatically and the subscriber then enters the DN and PIN, as described in the next step. If more than one remote DISA feature is assigned to the DISA DN, the subscriber then enters that feature's activation code. If hardware resources are not available to process the call, the subscriber receives no service circuit (NOSC) treatment and must reattempt the call. If software resources are not available to process the call, the subscriber receives NOSR treatment and must reattempt the call.

-continued-

NFA: Remote Access, Flash Processing (continued)

Activation of NFRA (continued)

Step	Action	Response
3	Enter the DN of the subscriber set plus a PIN, and an octothorpe (#) to signal the end of dialing on Digitone sets.	If an incorrect DN or PIN is entered, the subscriber receives feature not allowed (FNAL) treatment. If the correct DN and PIN are entered, a remote connection is established between the originator and an NFA trunk. The call between the remote subscriber and the NFA trunk remains in place until either party disconnects or until either step 4 or step 5 occurs.
4	Flash the switchhook	If the NFA trunk connection is a remote access to the same office as the one serving the originator, then a flash is propagated on the NFA trunk. ▪ If the switchhook is flashed, the subscriber can put the NFA trunk on hold in order to activate another feature. ▪ If the switchhook is flashed, the subscriber can put the NFA trunk on hold in order to connect to another call. ▪ If the switchhook is flashed, the subscriber can remove the NFA trunk connection from hold and the trunk will be reconnected to the call. If the NFA trunk connection is a remote access to a different office than the one serving the originator, then a flash is not propagated on the NFA trunk.
5	IP dials digits	The DMS switch receives digits from the IP as specified in the existing protocol for IP dialing. Once the end of digits indication is received, the NFA trunk connection to the IP is disconnected.
	End	

NFA: Remote Access, Flash Processing (continued)

Billing

NFA: Remote Access, Flash Processing uses Bellcore billing format. AMA record generation is based on the subscribers datafill. Call code types 174 and 175, which use an existing structure code 00001, and module code 047 are used to record NFA billing information.

Call type 174 records explicit connections (in BCS34), as well as remote connections (in BCS35). The terminating DN corresponds to the feature access code used on explicit connections. The terminating DN contains zeros on remote connections.

Station Message Detail Recording (SMDR)

NFA: Remote Access, Flash Processing does not affect SMDR.

Datafilling office parameters

When digit collection is initiated on a line that has activated NFA implicit access, a UTR connection is made to the subscribers line if the lines peripheral is engineered with UTR cards. The possibility of talkoff associated with UTR cards exists if the frequency of the subscribers voice is so close to the frequency of a DTMF tone that the UTR cannot distinguish between the two. In order to decrease the possibility of UTR talkoff, NFA implicit access traffic can be routed to network DTMF receivers for digit collection. A new office parameter called NFA_IMPLCT_BYPASS_UTR is added to table OFCENG and is set with a default value of N. If this parameter is set to N during an implicit access connection, digit collection is performed with UTRs, provided the lines peripheral is equipped with them. If the line's peripheral is not equipped with UTRs, network DTMF receivers are used for digit collection.

If this parameter is set to Y during an implicit access connection, the UTRs are bypassed whenever digit collection is initiated. Network DTMF receivers on the NT2X48 card are always used for digit collection for lines with NFA implicit access capabilities.

- The value in the office parameter NFA_IMPLCT_BYPASS_UTR only impacts the digit collection procedures for lines that have initiated a flash or gone off-hook to activate the NFA implicit access feature. It does not impact the digit collection procedures for any other features.
- The office parameter NFA_IMPLCT_BYPASS_UTR does not affect NFA lines which use DP digit collection procedures.
- If the office parameter NFA_IMPLCT_BYPASS_UTR has been set to Y, UTR will never be used for digit collection for lines that have activated the NFA implicit access feature. UTRs will never be used even if all the network DTMF receivers are busy.

NFA: Remote Access, Flash Processing (continued)

The following table shows the office parameters used by NFA: Remote Access, Flash Processing. For more information about office parameters, refer to *Office Parameters Reference Manual,* 297-1001-455.

Office parameters used by NFA: Remote Access, Flash Processing

Table name **Parameter**	**Explanation and action**
OFCENG NFA_IMPLCT_BYPASS_UTR	This parameter allows an office to bypass using UTRs for digit collection on lines that have activated the NFA implicit access feature. Instead, network DTMF receivers are used for digit collection. Default is N. Activation is immediate. ***Note:*** This parameter does not affect NFA lines which use DP digit collection.

NFA: Remote Access, Flash Processing (continued)

Datafill sequence

The following tables require datafill to implement NFA: Remote Access, Flash Processing. The tables are listed in the order in which they are to be datafilled.

Datafill tables required for NFA: Remote Access, Flash Processing

Table	Form	NTP	Purpose of table
CLLI	2100A, B	297-1001-451	Common Language Location Identifier The NFA trunk group type must be datafilled in table CLLI.
TRKGRP	(no form)	297-1001-451	Trunk Group Table TRKGRP contains some of the customer-defined data associated with each trunk group that exists in the switch. A trunk group type (NFA) is added, and field ANSTOUT specifies time in seconds within which the far end of the NFA trunk has to respond with answer supervision after its seizure from the DMS-100 switch.
TRKSGRP	2151A, B, C, D, E, G, H, J, K, L, M, N, O, P	297-1001-451	Trunk Subgroup Table TRKSGRP lists the signaling information for each subgroup that is assigned to one of the trunk groups listed in table TRKGRP. Fields in a tuple used for NFA are restricted to specific values.
TRKMEM	2152A, B	297-1001-451	Trunk Member Table TRKMEM lists the data associated with each trunk that is assigned to one of the trunk groups and subgroups specified in table TRKGRP and table TRKSGRP. Fields in a tuple used for NFA are restricted to specific values.

-continued-

NFA: Remote Access, Flash Processing (continued)

Datafill tables required for NFA: Remote Access, Flash Processing (continued)

Table	Form	NTP	Purpose of table
XLANAME	2202A-D	297-1001-451	List of Translator Names Table XLANAME defines the AIN translator names. Customer group translators reflect the class of service for the customer group. The preliminary translator states the exceptions to the network class of service (NCOS).
DIGCOL	2001A, B	297-1001-451	Digit Collection Table DIGCOL defines the digit collection procedures and the dialing plan.
ANNS	2350A, B	297-1001-451	Announcements Table ANNS defines the announcement used by the NFRA feature. The announcement phrases are datafilled in table DRMUSERS. Announcement type NFRA must be used for the ANNTYP field when defining the NFRA announcement.
ANNMEMS	2351A, B	297-1001-451	Announcement Members Table ANNMEMS contains information about announcement group members defined in table ANNS.
DRAMS	2353A, B	297-1001-451	Digital Recorded Announcement Machine Table DRAMS lists information for the trunk cards that constitute a digital recorded announcement machine. This table is required if the DMS switch has software package BCS7 and higher and is equipped with a digital recorded announcement machine.
DRMUSERS	2381A, B	297-1001-451	Digital Recorded Announcement Machine Users Table DRMUSERS contains the lists of phrases that constitute one announcement.

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NFA: Remote Access, Flash Processing (continued)

Datafill tables required for NFA: Remote Access, Flash Processing (continued)

Table	Form	NTP	Purpose of table
DRAMTRK	2354A, B	297-1001-451	Digital Recorded Announcement Machine Track Table DRAMTRK lists information for the trunk cards that constitute a digital recorded announcement machine. This table is required if the DMS switch has software package BCS7 and higher and is equipped with a digital recorded announcement machine.
CUSTENG	2280A, B	297-1001-451	Customer Engineering Table CUSTENG defines the engineering parameters and options for each of the customer groups. One of these parameters is the maximum NCOS value (up to 255) that can be assigned to a customer group.
CUSTHEAD	2236A, B	297-1001-451	Customer Group Head Table CUSTHEAD contains data that applies to all lines in a customer group. Some data, such as the digit collection name, is entered for all tuples in the table. Other data, such as a feature translator name, are optional.
CUSTNAME	(no form)	297-1001-451	Customer Name Table CUSTNAME defines the customer group names. In most of the examples in this chapter, customer group names IBNTST and RESGRP are used.
NCOS	2204A, B	297-1001-451	Network Class of Service Table NCOS and a subscribers customer group are used to index to table NCOS, which specifies the feature translator name in field FEATXLA. The XLAS option must be used for field NCOSOPTN if order to be able to specify a feature translator name in the FEATXLA field.

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NFA: Remote Access, Flash Processing (continued)

Datafill tables required for NFA: Remote Access, Flash Processing (continued)

Table	Form	NTP	Purpose of table
CUSTSTN	2238A-D	297-1001-451	Customer Station Table CUSTSTN defines remote access datafill specific to a customer group. Option NFRA is available for fields OPTNAME and OPTION. These fields specify that the customer group has the NFRA option and that lines in that group may have the remote access capability to NFA assigned to them. Three subfields are associated with the NFRA option: REMTRKGP (trunk group for remote accesses), REM_SC (remote access service code), and NUMDIGS (number of digits required to translate the subscribers home DN).
DNROUTE	2207	297-1001-451	Directory Number Route Table DNROUTE defines the DISA DN, including its CUSTGRP, SUBGRP, NCOS, and other DISA options. Option NFRA is available for the DISAOPT subfield and is used to indicate that the DISA DN can be used for remote access to NFA. Option NCOSOPT is available for the second DISAOPT subfield. It is suggested that this option be used on DISA DNs that have been assigned the NFRA option.

-continued-

NFA: Remote Access, Flash Processing (continued)

Datafill tables required for NFA: Remote Access, Flash Processing (continued)

Table	Form	NTP	Purpose of table
IBNLINES	2227A, B	297-1001-451	IBN Lines Table IBN lines is used to specify the customer group of an individual MDC or RES line. Also specified are a subgroup, the SNPA and a NCOS. For MDC lines, the customer group is specified in this table. For RES lines, a line attributes index (LAI) into table LINEATTR (like POTS) is used. This LAI is specified in IBNLINES and must be marked in table LINEATTR as supporting RES lines.
LINEATTR	2208A, B	297-1001-451	Line Attribute Table LINEATTR is used to identify the customer group for RES lines, as well as subgroup and NCOS. The LAI must be marked as supporting RES service before the conversion from POTS to RES will be performed, by setting the RESINFO field to Y. It is recommended that all RES lines be entered in the same customer group.
IBNXLA	2228	297-1001-451	IBN Translations Table IBNXLA defines the NFRA feature access code for use in selecting among different DISA remote access options. Option NFRA is available for field FEATURE and is used to remotely access the NFA option. The access code for NFRA can only be entered by a subscriber who is selecting an option to use with DISA. Subfield EXT_CONV is added to each tuple that has been datafilled with a FTR selector of NFAEXPL. This subfield indicates whether or not extended conversion is required for calls initiated with that feature access code.

-continued-

Datafill tables required for NFA: Remote Access, Flash Processing (continued)

Table	Form	NTP	Purpose of table
IBNFEAT	2217A, B	297-2001-451	IBN Features Table IBNFEAT defines the NFA features for a subscribers line. Three subfields activate NFA remote access: REM_ACC (remote access), AMA_REM (remote AMA), NFRAPIN (NFRA personal identification number). When Y is entered for subfield REM_ACC, remote access to NFA is allowed. Then subfield AMA_REM is prompted, which indicates whether an AMA record should be generated to record the connection to the NFA trunk. Subfield NFRAPIN specifies the PIN which the subscriber must use in order to initiate a remote NFA connection.
LCCOPT	(no form)	297-1001-451	Line Class Code Compatible Options Table LCCOPT is a read only table that cannot be modified by the customer. When adding lines by service order, this table and the incompatible options table (OPTOPT) are referenced to ensure the compatibility between line class code and options to ensure that incompatible options are not added to the same line. A value is added for the NFA line option.
End			

Datafilling table ANNS

The following procedure shows the datafill for table ANNS. This procedure contains only those fields that apply to NFA: Remote Access, Flash Processing. Refer to *Customer Data Schema*, 297-1001-451, for a description of the other fields.

NFA: Remote Access, Flash Processing (continued)

Datafilling table ANNS

Field	Subfield	Explanation and action
CLLI		*Announcement common language location identifier* This field specifies the announcements in table CLLI. Enter the alphanumeric code that represents the announcement in table CLLI.
ANTYPE		*Announcement type* This field specifies the announcement type. Enter NFRA.
TRAFSNO		*Traffic separator number* This field specifies whether or not the switching unit has the optional traffic separation software. Enter the outgoing traffic separation number from 1 to 127 if the switch has the traffic separation software. If not, enter 0.
MAXCONN		*Maximum connections* Enter 1. AIN announcements only allow a maximum of one simultaneous connection per channel when an announcement is playing. Valid entries are from 0 to 255.
CYTIME		*Cycle time* Enter 0. The actual cycle time is determined by the DRAM utility when an announcement is played. Valid entries are from 0 to 255.
MAXCYC		*Maximum cycles* Determines the number of times an announcement (ANN) is to be played for a user. Valid entries are from 0 to 255.

Datafill example for table ANNS

The following example shows sample datafill for the NFRA feature in table ANNS. In this example, NFRA is the announcement type used for the NFRA announcement, and STND is the announcement type used for the DISA announcement.

Datafill example for table ANNS

Example of a MAP display

```
 CLLI     ANTYPE TRAFSNO MAXCONN  CYTIME MAXCYC

 NFRAANN  NFRA      23      15       0      1

 DISARAC  STND      23      15      12      1
```

Datafilling table CUSTSTN

The following procedure shows the datafill for table CUSTSTN. This procedure contains only those fields that apply to the NFRA feature in table CUSTSTN. Refer to *Customer Data Schema*, 297-1001-451, for a description of the other fields.

Datafilling table CUSTSTN

Field	Subfield	Explanation and action
CUSTNAME		*Customer group name* This field specifies a customer group name. Enter the 1- to 16-character alphanumeric name.
OPTNAME		*Option name* This field specifies an option name. Enter NFRA.
OPTION		*Option* This field specifies the NFRA option on a customer group basis and retries the value for NFRA. Enter NFRA.
	REMTRKGP	*Remote trunk group* This subfield specifies the trunk group over which a remote connection is made upon activation of NFA remote access. (The trunk group selected must already be datafilled in table TRKGRP with a GRPTYP of NFA). Enter the remote trunk group name.
	REMSC	*Remote service code* This subfield specifies the service code that is outpulsed over the remote trunk during a remote access. Valid entries are from 1 to 5 digits, from 0 to 9, #, or *. Also, a $ can be entered to indicate that a service code is not assigned to this subscriber.
	NUMDIGS	*Number of digits* This subfield specifies the length (in digits) of the NFRA subscribers DN (base station). This value depends on the number of digits required for extension dialing in the customer group dialing plan. RES customers have a 7 datafilled here, while IBN customers may have a 4. Enter a value from 1 to 10.

Datafill example for table CUSTSTN

The following example shows sample datafill for the NFRA feature in table CUSTSTN. In this example, the customer group IBNTST is assigned the NFA Remote Access, Flash Processing feature.

NFA: Remote Access, Flash Processing (continued)

NFRA is added to the OPTNAME and OPTION fields. These fields specify that the customer group has the NFRA option and that lines in that group may have the remote access capability to NFA assigned to them. REMTKGP is the trunk group over which a remote connection is made upon activation of NFA remote access. The trunk group selected must already be datafilled in table TRKGRP with a GRPTYP of NFA. REM_SC is the service code that is outpulsed over the NFA trunk during a remote access. NUMDIGS is the number of digits that the subscriber needs to enter in order to identify their home telephone number.

Datafill example for table CUSTSTN

Example of a MAP display

```
CUSTNAME   OPTNAME                    OPTION
-------------------------------------------------
IBNTST       NFRA   NFRA   NFRATKGP   99999 7
```

Datafilling table DNROUTE

The following procedure shows the datafill for table DNROUTE. This procedure contains only those fields that apply to the NFRA feature in table DNROUTE. Refer to *Customer Data Schema*, 297-1001-451, for a description of the other fields.

Datafilling table DNROUTE

Field	Subfield	Explanation and action
AREACODE		*Area code* This subfield specifies the area code to which the NFA is assigned. Enter the 3-digit area code.
OFCODE		*Office code* This subfield specifies the office code of the DISA DN. Enter the 3-digit office code.
STNCODE		*Station number code* This subfield specifies the station number of the DISA DN. Enter the 4-digit station number.
DNRESULT		*Directory number result* This field consists of several subfields. Explanations follow.
	DN_SEL	*Directory number selector* This subfield specifies the DN selector. Enter FEAT.

-continued-

NFA: Remote Access, Flash Processing (continued)

Datafilling table DNROUTE (continued)

Field	Subfield	Explanation and action
	FEATURE	*Feature* This refinement specifies the feature to be added. Enter DISA.
If DISA is entered for FEATURE, subfields CUSTGRP, SUBGRP, AUTHREQ, SMDRTO, SMDRFROM, INTRAGRP, and OPTIONS require datafill.		
Note: The values of fields AUTHREQ, SMDRTO, and SMDRFROM do not affect the NFRA feature.		
	CUSTGRP	*Customer group* Enter the customer group name to which the DISA DN belongs. Valid entries are from 1- to 16-characters long.
	SUBGRP	*Subgroup* Enter the subgroup in the customer group to which the DISA DN belongs. Valid entries are from 0 to 7.
	AUTHREQ	*Authorization required* This subfield specifies whether an authorization code is required for users of this DISA DN. Valid entries are Y or N.
	SMDRTO	*Station message detail recording to* This subfield specifies whether or not the originator accesses DISA. Valid entries are Y or N.
	SMDRFROM	*Station message detail recording from* This subfield specifies whether SMDR is required on the leg of the call from DISA to the final destination. Valid entries are Y or N.
	INTRAGRP	*Intragroup* This subfield specifies whether SMDR is part of an intragroup. Valid entries are Y or N.
	OPTIONS	*DISA options* This subfield consists of subfield DISAOPT.

-continued-

NFA: Remote Access, Flash Processing (continued)

Datafilling table DNROUTE (continued)

Field	Subfield	Explanation and action
	DISAOPT	*DISA option* This subfield specifies the DISA options. Enter NCOSOPT followed by the NCOS to be used by the DISA DN. The NCOSOPT should be used to specify the network class of service for use by the DISA DN.

Note: It is recommended that a specific NCOS be assigned to each DISA DN used for NFRA access. The NCOS can be assigned by adding the NCOSOPT to the DISA DN as a DISAOPT.

End

Datafill example for table DNROUTE

The following example shows sample datafill for the NFRA feature in table DNROUTE. In this example, NFRA is added to the DISAOPT range. When this option is assigned to a DISA DN, the DN can be used to remotely access the NFA feature.

Datafill example for table DNROUTE

Example of a MAP display

```
AREACODE   OFCCODE   STNCODE                DNRESULT
613        621       1000        FEAT DISA IBNTST 0 N N N
                                 N (NFRA) (NCOSOPT 0) $
```

Datafilling table IBNXLA

The following procedure shows the datafill for table IBNXLA. This procedure contains only those fields that apply to the NFRA feature in table IBNXLA. Refer to *Customer Data Schema*, 297-1001-451, for a description of the other fields.

NFA: Remote Access, Flash Processing (continued)

Datafilling table IBNXLA		
Field	**Subfield**	**Explanation and action**
KEY		*Key field* This field consists of subfields XLANAME and DGLIDX.
	XLANAME	*Translator name* Enter the 1- to 8-character name assigned to the translator as the access code.
	DGLIDX	*Digilator index* Enter the 2 digit or digits assigned to the index. This access code is used by DISA users who must distinguish NFRA from other DISA features.
RESULT		*Result* This field consists of several subfields, depending upon the feature activation.
	TRSEL	*Translation selector* This subfield specifies the translation selector type. Enter FEAT or FTR.
If FEAT is entered, subfields ACR, VCDR, and FEATURE require datafill.		
	ACR	*Account code entry* This subfield specifies whether or not an account code entry is required. Valid entries are Y or N.
	SMDR	*Station Message Detail Recording* This subfield specifies whether or not SMDR is required for calls originated by a customer group station or an attendant console. Valid entries are Y or N.
	VCDR	*Variable call detail record* Enter N.
	FEATURE	*Feature* This subfield specifies the feature assigned to the access code. Enter NFRA.
If NFRA is entered, subfields NO_ACCODE_DIGITS and FTR_TYP are presented.		
	NO_ACCODE_ DIGITS	*Number of activation code digits* This subfield specifies the number of digits in the activation code. Valid entries are from 0 to 7.

-continued-

NFA: Remote Access, Flash Processing (continued)

Datafilling table IBNXLA (continued)

Field	Subfield	Explanation and action
	FTR_TYPE	*FTR selector* This subfield specifies the feature selector. Option NFAEXPL is added to datafill access codes for explicit access. Enter NFAEXPL.
If NFAEXPL is entered, subfields EXPLTKGP, EXPL_SC, and EXT_CONV require datafill.		
	EXPLTKGP	*Explicit trunk group* This subfield specifies the trunk group over which an explicit connection is made. Enter NFA. ***Note:*** The trunk group entered must have been datafilled already in table TRKGRP with a GRPTYP of NFA.
	EXPL_SC	*Explicit service code* Enter the service code to be outpulsed over the NFA trunk during an explicit access. Valid entries are from 1 to 5 digits, from 0 to 9, #, or *.
	EXT_CONV	*Extended conversion* This subfield specifies whether or not extended DP to DTMF conversion is to be performed for all NFA calls that originate from this feature access code. Valid entries are Y or N. ***Note:*** The value should be set to N for base DP to DTMF conversion.
End		

NFA: Remote Access, Flash Processing (continued)

Datafill examples for table IBNXLA

The first example shows sample datafill for the NFRA feature in table IBNXLA. In this example, FEAT selector NFRA is used to define remote access to NFA.

Datafill example for table IBNXLA

Example of a MAP display

KEY	RESULT
NFAXLA1 78	FEAT N N N NFRA

The second example shows sample datafill for the NFRA feature in table IBNXLA. In this example, FTR selector NFAEXPL is used to define extended conversion.

Datafill example for table IBNXLA

Example of a MAP display

KEY	RESULT
NFAXLA1 79	FTR 2 NFAEXPL NFATKGP1 9999 Y

Datafilling table IBNFEAT

The following procedure shows the datafill for table IBNFEAT. This procedure contains only those fields that apply to the NFRA feature in table IBNFEAT. Refer to *Customer Data Schema*, 297-1001-451, for a description of the other fields.

CAUTION

Use the service order system, not the table editor, to add and delete tuples to and from table IBNFEA T. Using the table editor to datafill this table can result in incompatible features being assigned to the line. The table datafill is shown here for information only.

NFA: Remote Access, Flash Processing (continued)

Datafilling table IBNFEAT		
Field	**Subfield**	**Explanation and action**
LEN		*Line equipment number* This field consists of the subfields SITE, FRAME, UNIT, DRAWER, LSG, and CIRCUIT. Refer to *Meridian Digital Centrex (MDC) Customer Data Schema*, 297-2001-451, for complete details on these subfields. Enter the LEN.
DNNO		*Directory number number* This field specifies the DN of the LEN being referenced. Enter a value from 0 to 6 for the DN.
DF		*Data feature* This field specifies the data feature assigned to the line. Enter NFA.
FEATURE		*Feature* This field specifies the data feature assigned to the line. Enter NFA.
DATA		*Data* Data is composed of subfields USR_ID, IMPLCT_AC, and REM_ACC. Explanations follow.
	USR_ID	*User identification* Enter the lines 1- to 10-digit user ID.
	IMPLCT_ACC	*Implicit access code* This subfield specifies whether or not the subscriber is allowed implicit access to the NFA trunk. Enter Y or N.
If Y is entered for IMPLCT_ACC, subfields IMPLCT_SC and IMPLCT_STAT require datafill.		
	IMPLCT_SC	*Implicit service code* Enter the 1- to 5-digit service code that is outpulsed over the NFA trunk during an implicit access.
	IMPLCT_STAT	*Implicit status* This subfield specifies the status of implicit access. Valid entries are ACT or INACT.
	EXPLCT_ACC	*Explicit access code* This subfield specifies whether or not the subscriber is allowed explicit access to the NFA trunk. Enter Y or N.

-continued-

NFA: Remote Access, Flash Processing (continued)

Datafilling table IBNFEAT (continued)

Field	Subfield	Explanation and action
If Y is entered for EXPLCT_ACC, subfields AMA_EXPLCT and AMA_IPDIAL are presented.		
	AMA_EXPLCT	*Automatic Message Accounting explicit* This subfield specifies whether or not an AMA record is generated following an explicit connection to the NFA trunk. Enter Y or N.
	AMA_IPDIAL	*Automatic Message Accounting IP dialing* This subfield specifies whether or not an AMA record is generated following a call that was dialed by the IP. Enter Y or N.
	REM_ACC	*Remote access* This subfield specifies whether or not the subscriber is allowed remote access to the NFA trunk. Enter Y or N.
If Y is entered for REM_ACC, subfields AMA_REM and NFRAPIN require datafill.		
	AMA_REM	*Remote Automatic Message Accounting* This subfield specifies whether or not an AMA record is generated following a remote connection to the NFA trunk. Enter Y or N.
	NFRAPIN	*NFRA Personal identification number* Enter the 2- to 10-digit PIN the subscriber must use in order to initiate a remote NFA connection.
End		

Datafill example for table IBNFEAT

The following example shows sample datafill for the NFRA feature in table IBNFEAT. In this example, the line is given implicit access and remote access to NFA.

Datafill example for table IBNFEAT

Example of a MAP display

```
 LEN              DNNO     DF    FEATURE
    DATA
-------------------------------------------------------
 HOST 00 0 09 07    0     NFA     NFA
   6211233 Y 33 INACT  Y  N  N  Y  Y  654321
```

NFA: Remote Access, Flash Processing (continued)

Translation verification tools

TRAVER

The following is an example of the output from the TRAVER (translations verification) command when it is used to verify translations for this feature. In this example, line 6215001 dials a DISA DN 6211012, which has been assigned the NFRA option.

TRAVER output example for NFA: Remote Access, Flash Processing

Line	Output
	>traver l 6215001 6211012 b
1	TABLE IBNLINES
2	HOST 00 0 08 01 0 DT STN RES 6215001 0 $
3	TABLE LINEATTR
4	0 1FR NONE NT FR01 0 613 P621 L613 TSPS 10 NIL NILSFC LATA1 0 NIL
5	NIL 00 Y RESGRP 0 2 $
6	LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
7	TABLE DNATTRS
8	613 621 5001
9	(PUBLIC (NAME TOM_WATSON) $)$ $
10	TABLE DNGRPS
11	TUPLE NOT FOUND
12	TABLE NCOS
13	RESGRP 2 0 0 RNCOS2 (XLAS RXCMN2 NXLA RES)$
14	TABLE CUSTHEAD: CUSTGRP, PRELIMXLA, CUSTXLA, FEATXLA, VACTRMT, AND
15	DIGCOL
16	RESGRP NXLA RESXLA RXCFN 0 RES
17	TABLE DIGCOL
18	RES specified: RES digit collection
19	TABLE IBNXLA: XLANAME RXCMN2
20	TUPLE NOT FOUND
21	default from table XLANAME:
22	RXCMN2
23	(NET N N N 0 N NDGT N Y GEN (LATTR 1) (EA MCI Y 0) $)$ 9
24	TABLE DIGCOL
25	NDGT specified: digits collected individually
26	TABLE LINEATTR
27	1 1MR NONE NT FR01 0 613 P621 L613 TSPS 10 NIL NILSFC LATA1 0 NIL
28	NIL 00 N $
29	LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
30	TABLE STDPRTCT
31	P621 (1) (0) 0

-continued-

NFA: Remote Access, Flash Processing (continued)

TRAVER output example for NFA: Remote Access, Flash Processing (continued)

Line	Output
32	. SUBTABLE STDPRT
33	WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
34	BILLING. CALL TYPE DEFAULT IS NP. PLEASE REFER TO
43	DOCUMENTATION.
44	. 621 632 N NP 0 NA
45	. SUBTABLE AMAPRT
46	. KEY NOT FOUND
47	. DEFAULT VALUE IS: NONE OVRNONE N
48	TABLE HNPACONT
49	613 128 2 (36) (1) (0) (0) 0
50	. SUBTABLE HNPACODE
51	. 621 621 DN 613 621
52	TABLE TOFCNAME
53	613 621
54	TABLE DNINV
55	613 621 1012 FEAT DISA RESGRP 0 N N N Y (NCOSOPT 0) (NFRA) $
56	TABLE DNATTRS
57	TUPLE NOT FOUND
58	TABLE DNGRPS
59	TUPLE NOT FOUND
60	TABLE LCASCRCN
61	613 L613 (28) OPTL N
62	. SUBTABLE LCASCR
63	. 621 622
64	TABLE PFXTREAT
65	OPTL NP Y NP UNDT
66	TABLE CLSVSCRC
67	KEY NOT FOUND
68	DEFAULT IS TO LEAVE XLA RESULT UNCHANGED
69	
70	+++ TRAVER: SUCCESSFUL CALL TRACE +++
71	DIGIT TRANSLATION ROUTES
72	1 Feature 6136211012 ST
73	TREATMENT ROUTES. TREATMENT IS: GNCT

End

NFA: Remote Access, Flash Processing (continued)

Service orders

The NFA feature is assigned to individual subscriber lines using the service order system (SERVORD).

Service order prompts

The following table shows the service order prompts used to assign the NFA feature to a line.

Service order prompts for NFA: Remote Access, Flash Processing

Prompt	Valid input	Defaults	Explanation
OPTION	NFA	NFA	Assigns NFA to the line.
USR_ID	numeric	numeric	Specifies the user ID.
IMPLCT_ACC	Y, N	Y	Allows implicit access to the NFA trunk.
IMPLCT_SC	numeric	0	Specifies the service code that is outpulsed over the NFA trunk during an implicit access.
IMPLCT_STAT	ACT/INAC	ACT	Specifies the status of implicit access.
EXPLCT_ACC	Y, N	Y	Allows explicit access to the NFA trunk.
AMA_EXPLCT	Y, N	N	Allows AMA record generation following an explicit connection to the NFA trunk.
AMA_IPDIAL	Y, N	N	Allows AMA record generation following an IP dialed call.
REM_ACC	Y, N	N	Allows remote access to the NFA trunk.
AMA_REM	Y, N	Y	This prompt only appears if REM_ACC is set to Y. Allows AMA record generation following a remote connection to the NFA trunk.
NFRAPIN	numeric	Y	This prompt only appears if REM_ACC is set to Y. Enter the remote access PIN.

NFA: Remote Access, Flash Processing (continued)

Example service orders

The following service order example shows how the NFA feature is added to an existing line using the ADO command. This line is assigned remote access to NFA.

Setting up NFA: Remote Access, Flash Processingusing ADO

Input and response

*Input in **Prompt** mode*

```
>SERVORD
 SO:
>ADO
 SO NUMBER NOW 91 6 5 PM
>(CR)
 DN_OR_LEN
>6215001
 OPTION:
>NFA
 USR_ID:  6215001
>(CR)
 IMPLCT_ACC: Y
>N
 EXPLCT_ACC: Y
>Y
 AMA_EXPLCT: N
>(CR)
 AMA_IPDIAL: N
>Y
 REM_ACC: N
>Y
 AMA_REM:
>Y
 NFRAPIN:
>654321
 OPTION:
```

-continued-

NFA: Remote Access, Flash Processing (continued)

Setting up NFA: Remote Access, Flash Processingusing ADO (continued)

Input and response

```
>$
 COMMAND AS ENTERED:
 ADO NOW 91 6 5 PM 6215001 (NFA 6215001 N Y N Y Y Y 654321)
 $
 ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>Y
```

*Input in **No-prompt** mode*

```
>ADO $ 6215001 NFA 6215001 N Y N Y Y Y 654321 $ Y
```

End

NFA: Remote Access, Flash Processing (continued)

The following service order example shows how NFA: Remote Access, Flash Processing is added to an existing line using the ADO command. This line is not assigned explicit access.

Setting up NFA: Remote Access, Flash Processing using ADO

Input and response

*Input in **Prompt** mode*

```
>SERVORD
 SO:
>ADO
 SO NUMBER NOW 91 6 5 PM
>(CR)
 DN_OR_LEN
>6215001
 OPTION:
>NFA
 USR_ID:  6215001

>(CR)
 IMPLCT_ACC: Y
>N
 EXPLCT_ACC: Y
>N
 AMA_IPDIAL: N
>(CR)
 REM_ACC: N

>Y
 AMA_REM:
>N
 NFRAPIN:
>654321
 OPTION:
>$
 COMMAND AS ENTERED:
 ADO NOW 91 6 5 PM 6215001 (NFA 6215001 N N N Y N 654321) $
 ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>Y
```

-continued-

NFA: Remote Access, Flash Processing (end)

Setting up NFA: Remote Access, Flash Processing using ADO (continued) **Input and response**
*Input in **No-prompt** mode*
>ADO $ 6215001 NFA 6215001 N N N Y N 654321 $ Y
End

NFA: AMA Modification

Feature name

NFA: AMA Modification

Feature number

AN0435

Feature package

NTXR25AA

BCS applicability

BCS36 and up

Description

This feature modifies the Network Facility Access (NFA) AMA generation procedures to incorporate the new definition for the Access Type field and alters the use of the CONV_REQ field of the 047 AMA module record. This module is appended to AMA records which are generated to record an NFA trunk connection as well as AMA records which are generated to record calls which are extended by an NFA trunk connection. This feature also eliminates all scenarios where two 047 module records are appended to a single AMA record.

Changes to the Access Method Field of the 047 Module

This feature incorporates the new definition of the access method field of the 047 AMA module into the NFA AMA generation procedures. The access method field has a range of four possible values: 0, 1, 2, and 3. Previously, the value recorded in this field indicated the type of IP connection which led to the creation of the corresponding AMA record. The value 0 was not used, a value of 1 indicated an implicit connection, a value of 2 indicated an explicit connection, and a value of 3 indicated a remote connection. With this feature, the access method field will indicate what type of NFA connection took place previous to the event which is recorded in the corresponding AMA record. A value of 0 will indicate that no IP connection occurred before the event which is recorded in the AMA record. A value of 1 will indicate that an implicit NFA connection took place prior to the event which is recorded in the AMA record. A value of 2 will indicate that an explicit NFA connection took place prior to the event which is recorded in the AMA record. A value of 3 will indicate that a remote NFA connection took place prior to the event which is recorded in the AMA record.

This feature also eliminates all scenarios in which two 047 modules are appended to any given AMA record. This is made possible with the new definition associated with the access method field. The call scenarios which previously caused two 047 records to be generated are outlined in the AM

NFA: AMA Modification (continued)

section of feature document NC0418 as well as the NFA section of the AIN translations guide.

CONV_REQ Modifications for Extended Conversion

This feature alters the use of the CONV_REQ field in the 047 AMA module. Previously, this field was set to 2 (true) if DP to DTMF conversion is performed while the subscriber is connected to the NFA trunk, and set to 1 (false) if DP to DTMF conversion is not performed while the subscriber is connected to the NFA trunk. With this feature, the CONV_REQ field will be set to 2 (true) if DP to DTMF conversion is performed at any time for the subscriber. This includes the time that the subscriber is connected to the NFA trunk as well as any call extended for the subscriber by an explicit access with extended DP to DTMF conversion.

Theory of operation

The originating DN field of AMA records with call codes 174 and 175 are always populated with the DN of the NFA subscriber.

The content of the terminating DN field of AMA records with call code 174 will depend on whether the record was generated to record an explicit connection or a remote connection. If the 174 record was generated to record an explicit connection, the terminating DN field will be populated with the feature access code which was dialed to initiate the explicit connection. If the 174 record was generated to record a remote connection, the terminating DN field will be populated with all zeros.

The service code field of the 047 module is always populated with the service code which was sent to the IP during the access which initiated the event which is recorded by the corresponding AMA record. This could be the implicit, explicit, or remote access service code, depending on the type of access which is being recorded.

The '*' and '#' digits will not be included in the terminating DN field of the 174 AMA record or in the service code field of the 047 module.

The access method field will indicate what type of NFA connection took place previous to the event which is recorded in the corresponding AMA record, as outlined in the previous section. In the case of remote access, the access method field will always contain a 0 for 047 modules which are appended to AMA records with call code 174. This is the case since the digit string that routes a call to the remote access authorization platform will be considered to be terminated on the platform. If the authorization is successful and results in a remote access connection to the IP, the remote access is considered to have not been dialed by the IP, but instead dialed by the remote access authorization platform. Since this is the case, the access

method field in the 047 module will be set to 0 to indicate that the remote access was not dialed by another IP access.

The conversion required field of the 047 module will always indicate whether or not Dial Pulse to DTMF conversion is performed for the subscriber while the subscriber is connected to the NFA trunk. This pertains to the IP access which initiated the event which is recorded by the corresponding AMA record.

Translations table flow

The NFA: AMA Modification does not affect translations table flow.

Feature limitations and restrictions

NFA: AMA Modification: has no limitations or restrictions.

Feature interactions

NFA: AMA Modification has no limitations or restrictions.

Activation/deactivation by the end user

NFA: AMA Modification does not require activation or deactivation by the end user.

Billing

The definition of two fields has changed in module code 047. These fields are Access Method and CONV REQ. Refer to Figure 3-9 for an example of an AMA record.

Figure 3-9
AMA record example

```
MODULE CODE:047C  SERV CODE:12345C  ACCESS:2C
SUBSCR ID:00000007246C CONV REQ:2C
```

The definition of the Access Method field has changed to indicate the type of NFA connection that took place previous to the event that is recorded in the corresponding AMA record. The range of values allowed for this field has not changed. This field still consists of two characters. The first character must still be taken from the set 0, 1, 2, or 3. The following definitions apply to these values:

- 0 = No previous IP connection
- 1 = Implicit Access

NFA: AMA Modification (continued)

- 2 = Explicit Access
- 3 = Remote Access

The second character is still hex-C.

For the CONV REQ field, the definition has also changed. This field is now set to 2 (true) if DP to DTMF conversion is performed for the subscriber at any point in the call.

Previously, this field was set to 2 (true) if DP to DTMF conversion is performed while the subscriber is connected to the NFA trunk, and set to 1 (false) if DP to DTMF conversion is not performed while the subscriber is connected to the NFA trunk. With this feature, the CONV_REQ field will be set to 2 (true) if DP to DTMF conversion is performed at any time for the subscriber. This includes the time that the subscriber is connected to the NFA trunk as well as any call extended for the subscriber by an explicit access with extended DP to DTMF conversion.

Station Message Detailed Recording (SMDR)

NFA: AMA Modification does not affect SMDR.

Datafilling office parameters

The following table shows the office parameters used by NFA: AMA Modification. For more information about office parameters, refer to 297-1001-455, *Office Parameters Reference Manual.*

Office parameters used by NFA: AMA Modification

Table name **Parameter**	**Explanation and action**
OFCENG CRS_SUBRU_POOL2_SIZE	This feature eliminates all scenarios where more than one 047 module code is appended to an AMA record. The provisioning rules for this parameter have been modified. Refer to "Parameter calculation" in this feature description for the provisioning rules.
Note:	
End	

Parameter calculation

Module code 047 uses the SUBRU_POOL2_BLOCK structure, which is 16 words in size. This structure is provisioned by the CRS_SUBRU_POOL2_SIZE office parameter in OFCENG. There are two

scenarios in which this module code is appended to an AMA record they are explicit and NFA dials a call for the subscriber. They are described below.

Explicit

The subscriber directly dials an NFA explicit access. In this case, an AMA record with call code 175 is generated, and a 047 module code is appended. The SUBRU_POOL2_BLOCK is first obtained when the NFA trunk is terminated upon, and is held until the trunk is released. The maximum provisioning impact to the SUBRU_POOL2_BLOCK due to this scenario is as follows:

The lesser of the two following values:

number of lines with NFA and AMA_EXPLCT set to 'Y', or
number of NFA trunks

NFA dials a call for the subscriber

In this scenario, an 047 module is appended to the AMA records that are generated in that case. The 047 module is obtained after the NFA trunk has outpulsed digits to the DMS (just prior to the trunk being released and the call being extended) and is held until the extended call is dropped. There are three categories of AMA records that the 047 might be appended to in the NFA-dial case. They are described below.

Existing AMA records that would normally be generated for the extended call This type uses one 047 module. The maximum provisioning impact for this scenario is number of lines with NFA.

A 175 record (as described above) This also uses one 047 module, but only occurs if the line involved has the AMA_IPDIAL field set to 'Y'. The maximum provisioning impact for this scenario is number of lines with NFA and AMA_IPDIAL set to 'Y'.

A 174 record This would occur if the initial access to the NFA trunk (initiated by the subscriber) then extends the call for the user to another access to an NFA trunk (and that line has AMA_EXPLCT set to 'Y'; otherwise this is the second category). In this case, one 047 module is appended to the 174 record. The maximum provisioning impact for this scenario is lesser of: number of lines with NFA and AMA_EXPLCT set to 'Y', or number of NFA trunks.

The maximum provisioning impact to the CRS_SUBRU_POOL2_BLOCK parameter occurs in a scenario in which all the NFA lines with AMA_EXPLCT set to 'Y' are described above, and all the remaining NFA lines are described in the first situation above. The formula for this would therefore be (the formula for 'C') + (total number of NFA lines - lesser of:

NFA: AMA Modification (end)

number of lines with NFA and AMA_EXPLCT set to 'Y', or number of NFA trunks).

Datafill sequence

NFA: AMA Modification does not affect datafill.

Translation verification tools

TRAVER

NFA: AMA Modification does not affect translation verification (TRAVER) tools.

Service orders

NFA: AMA Modification does not affect service orders.

DMS-100 Family

Network Facility Access (NFA)

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