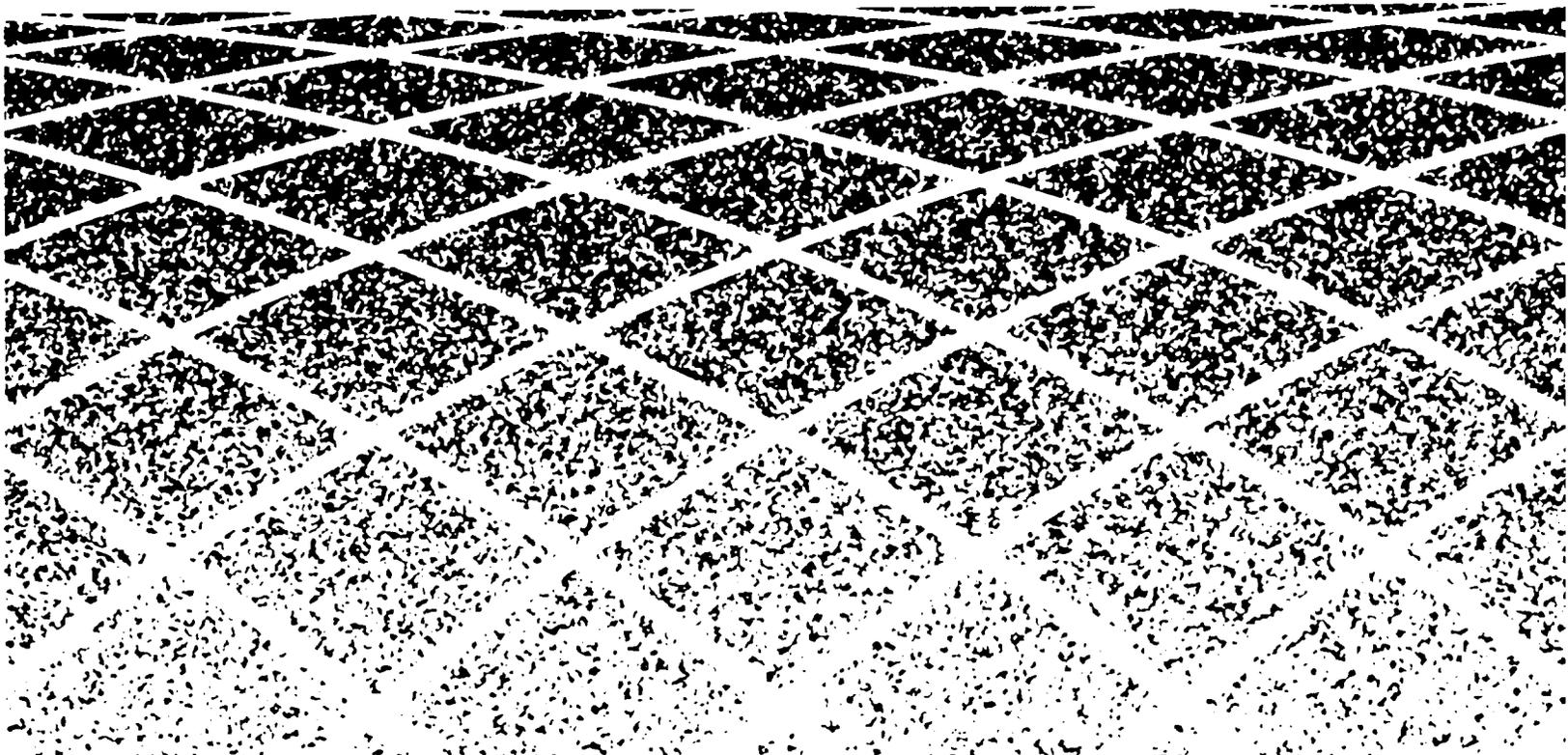




AT&T 234-090-182AC
Issue 1
April 1994

4ESS™ SWITCH

Product Release Document
4E18/4E19 Release 2 Generic



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About This Document

1. Purpose

1.01 The purpose of the Product Release Document (PRD) is to provide customers with information pertaining to the new features that are introduced in the 4ESS™ switch. A PRD is written to cover the features introduced in quarterly generic releases and full generic releases. This particular PRD provides information pertaining to the new features included in the 4E18/4E19 Release 2 generic.

2. Scope

2.01 The Product Release Document provides customers with information not covered in other 4ESS switch documentation. It is not a replacement for other documentation such as Standard AT&T Practices, Task Oriented Practices (TOP), Maintenance Reference Handbooks, etc., that support the 4ESS switch. The information in this document is intended only for the introduction of the new 4E18/4E19 Release 2 features, not the long-term maintenance. Since other documentation is used for the operation and maintenance of features after their introduction into the 4ESS switch, this PRD will not be reissued.

3. Intended Audience

3.01 This document is intended for people involved in testing, provisioning, maintenance, administration, and technical support of the 4ESS switch. Feature managers, Integrated Test Network (ITN) personnel, field support, Technical Control

Center (TCC), Product Engineering Control Center (PECC), and National Electronics System Assistance Center (NESAC) personnel are examples of some of the people who will use the PRD.

4. How to Use This Document

4.01 The 4E18/4E19 Release 2 generic contains 17 new features. The first 17 chapters in this document give information about these features. The chapters are in numerical order according to feature number. The chapter titles are also the feature names. A final chapter has been added to give important information that does not relate to a specific feature.

4.02 The following is a list of the chapters contained in this document with a brief description of the feature covered in that chapter:

Chapter 1: *Full Point Code Routing (FPCR) and E-Link Access Features (247/344)*

These two features provide the capability of having a direct connection from a signaling end point (SEP) to a Signal Transfer Point (STP) that is not a home STP (non-home STP). The links connecting an SEP and a non-home STP are called Extended Access Links (E-links). With E-links, the Common Network Interface (CNI) has the ability to specify up to three signaling routes (a primary and two alternate routes) to any signaling point in the network.

Chapter 2: *Advanced Intelligent Network (AIN) Dialed Number Triggers and Interactive Announcements Features (375/379)*

This Local Exchange Carrier only feature provides advanced services via switch and database interaction. The feature logic is located in a centralized node in the network rather than in each individual switching system node. The feature supports dialed number triggers (also known as 3/6/10 triggers), shared interoffice triggers, serial triggering, and interactive announcements.

Chapter 3: *Automatic Message Accounting Formatter Function Replacement Feature (384d)*

The Automatic Message Accounting (AMA) formatter is a kernel level process that collects recording information on calls from the 1A Processor, formats the AMA records, and stores the records on disk.

Currently, updates to the formatter process require that a new formatter be loaded and the old formatter be killed.

With the activation of this feature (AMA Formatter Function Replacement), the AMA formatter functions will be smaller (split). This will allow formatter process updates without killing the old formatter, which in turn decreases the chance of revenue loss.

Chapter 4: *AT&T 3B20D Conversion to 3-1/2 Inch Small Computer System Interface (SCSI) Disks Feature (385)*

This feature provides 3-1/2 inch 1 GB SCSI disk drives to replace the existing 600 MB SCSI disk drives in AT&T 3B20D computers. The change will affect 4ESS switches only when replacements are required.

Chapter 5: *Announcement System Manager—Plus Interface with Service Circuit Units Feature (386)*

The Announcement System Manager—Plus (ASM-Plus) is a cost effective announcement administration system that initiates announcement updates to Service Circuit Systems for the Local Exchange Carriers (LECs). The ASM-Plus consists of two main hardware components: The ASM-Plus Administrator and the ASM-Plus Controller. The ASM-Plus Administrator, a PC-based system, is where the end users administer announcement activities. The ASM-Plus Administrator interfaces with the ASM-Plus Controller using high speed modems and an analog line.

Chapter 6: *Ring Node Version Number Feature (395)*

This feature makes it possible to confirm that the AT&T 3B20D computer disk and the operating ring node are working on the same version of the node processor file (lvfile). Lack of concurrency in the lvfiles can result in call failures.

Chapter 7: *CCIS2WRE Field Enhancements in Recent Change (RC) Feature (403)*

This feature greatly simplifies the process of switching trunks connected to the 4ESS switch when an office replaces the 1A ESS™ switch with a 5ESS® switch. No longer do all trunks have to be manually disabled, removed, added back, and reactivated.

Chapter 8: *Feature Group-D Carrier Identification Code Expansion Cause Transparency Feature (405)*

The Feature Group-D (FG-D) Carrier Identification Code (CIC) Expansion Cause Transparency feature changes the Integrated Services Digital Network User Part (ISUP) cause value sent by the 4ESS Access Tandem switch to the Local Exchange Carrier (LEC) end office.

Chapter 9: *10-Digit Global Title Translation (GTT) Support Feature (3917b)*

This feature introduces a method for the Signaling Network Analysis System (SNAS) to determine the identity of the Network Control Point (NCP) application that was queried, that is, the point code and subsystem number, without having to support a duplicate database of global title translations.

Chapter 10: *Inbound 10-Digit Global Title Translation File Structure Expansion Feature (3949)*

The Inbound 10-Digit Global Title Translation (GTT) File Structure Expansion feature (proprietary) supports the long-term forecasts for dialed digit numbers for Inbound Services in 4ESS switches. It provides 500,000 records, a maximum of 7,000 unique NPA-XXX combinations, and 1,023 Point Code/Subsystem Number pairs. The growth in the number of NPA-XXX and GTT entries requires expanding the file area that supports the tables. This chapter covers the Inbound 10-Digit GTT file structure expansion procedures.

Chapter 11: *Building Long Distance Services (BLDS) Call Disposition Recording Feature (3991)*

This feature causes the Call Disposition Module (317) to be added to originating Access Charge Verification (ACV) records or originating Automatic Message Accounting (AMA) records that contain an ACV module. Previously, ACV recording had only been available for switched-access calls on Local Carrier Connecting (LCC) Trunk Subgroups (TSGs). With this feature, ACV recording will also become available for nodal services/arrangements on Private Branch Exchange (PBX) and Single Trunk Customer (STC) TSGs.

Chapter 12: *Self-Provisioning Global Title Translation (GTT) Feature (4032)*

The Self-Provisioning Global Title Translation (GTT) feature provides a fast and cost effective method of provisioning Software Defined Network (SDN) GTT records in the 4ESS switch.

Chapter 13: *1A/1B Processor Recent Change Throughput Improvements Feature (4057)*

The 1A/1B Processor Recent Change (RC) software currently does many different operations to load a specific RC. Of all the operations involved, writing the new RC date to the 3B Attached Processor System (APS) is the most time consuming.

The activation of this feature will eliminate unnecessary disk reads/writes and reduce the amount of time needed for each RC operation.

Chapter 14: *Never Miss a Call Feature (4136)*

Never Miss a Call (NMC) is a proprietary, pre-answer call redirection feature. It provides Centralized Alternate Destination Call Redirection (CADCR) to switched-egress customers who were not offered CADCR because of how the Local Exchange Carrier (LEC) end office handled certain busy conditions. With this feature, a customer's call can be redirected even if the LEC does not return a busy trigger to the original AT&T switch. Specifically, this feature increases the number of CADCR triggers that invoke a redirection and expands the conditions under which the Ring/No Answer timer is activated for switched-egress calls.

Chapter 15: *International ISDN User Part (INUP) Echo Control—Phase 2 Feature (4180a)*

This feature expands the capabilities of the International Integrated Services Digital Network User Part (INUP) Echo Control feature (4180) to apply to INUP Per Call Control (PCC) test calls.

Chapter 16: *Increase International Point Codes Feature (4213)*

This feature increases the number of international point codes available at International Switching Centers from 64 to 128. This increase will allow more countries to be homed on International Switching Center 4ESS switches.

Chapter 17: *ABC Architecture Modification: Identification of Terminating Switch Feature (4218)*

The Adjunct Based Capabilities (ABC) architecture for the 4ESS switch requires that an "Egress Indicator" be provisioned in the translation data to determine that it is the terminating switch for ABC functions. However, due to the cancellation of features that used the terminating switch functions in the original ABC architecture, support for provisioning the Egress Indicator was not provided in the core network provisioning system. To resolve this problem, an ABC modification has been added to the number of methods the 4ESS switch uses to determine that it is the "terminating" switch for a call.

Chapter 18: *Updates and Notices*

This chapter points out differences between the 4E18 Release 2 and 4E19 Release 2 generics as a result of two recent modification requests. Some change made in 4E19 Release 2 were not made in 4E18 Release 2 due to patch space limitations.

4.03 A list of abbreviations and acronyms, and their definitions, is included at the end of this document.

5. Product Safety Labels

- 5.01** There are three types of safety labels used in AT&T documentation: DANGER, WARNING, and CAUTION. This document does not contain safety labels.

6. How to Comment on This Document

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Full Point Code Routing (FPCR) and E-Link Access Features (247/344)

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Full Point Code Routing (FPCR) and E-Link Access Features (247/344)

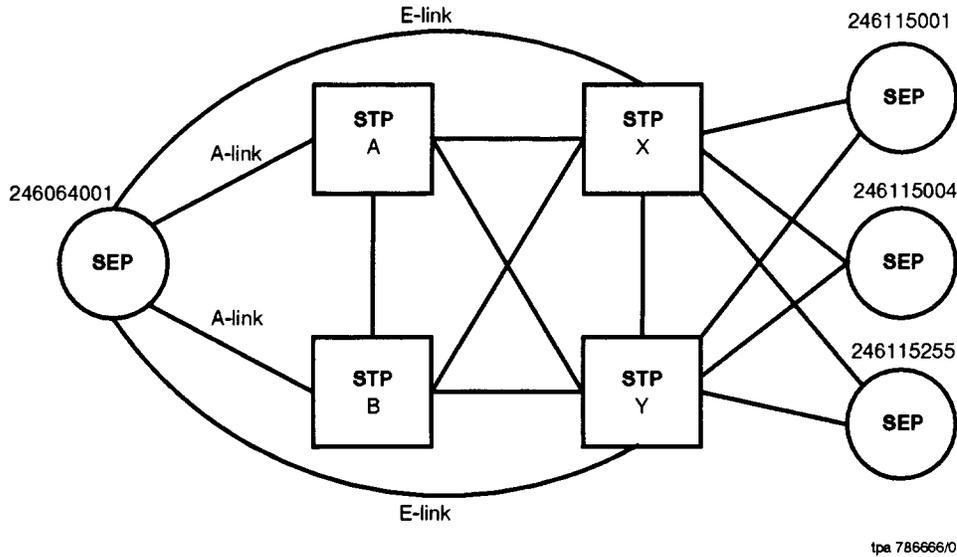
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1. Feature Description

1.01 Links are defined as the connections used to carry signaling messages between two signaling points. The links that connect a signaling end point (for example, a 4ESS™ switch) to a Signal Transfer Point (STP) pair are called A-links. (A signaling end point (SEP) is a point where signaling messages originate or terminate but are not switched.) The STP that is connected to an SEP via an A-link is called a home STP with respect to the SEP. These two features provide the capability to have a direct connection from an SEP to an STP that is not a home STP (non-home STP). The links that connect an SEP to a non-home STP are called Extended Access Links (E-links). See Figure 1-1 for a pictorial example of A-links, E-links, home STPs, and non-home STPs.

1.02 The following are some of the advantages of having E-links in the network:

- E-links provide the Common Network Interface (CNI) with the ability to specify additional signaling routes to any signaling point. Up to three signaling routes can be specified: a primary route and two alternate routes.
- If an A-link set fails, E-links can be used as backups and vice versa.
- E-links improve network reliability by providing additional destination routes. The possibility of an SEP being isolated from the network is minimized.
- With E-links, traffic can be switched between A-links and E-links for network reconfiguration.
- Traffic can be routed directly to non-home STP pairs thereby reducing the number of intermediate STPs that are involved in a call. This speeds up call setup which improves network performance and network utilization.

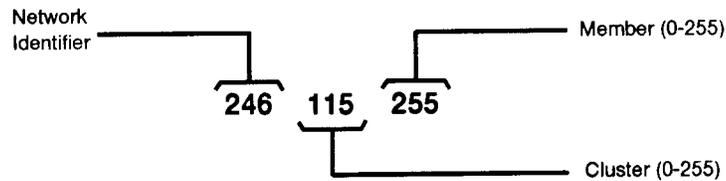


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Figure 1-1. A-Link and E-Link Routing

1.03 In order to make the most effective use of E-links, full point code routing (FPCR) is required. A point code is a unique 9-digit number that is assigned to every signaling point in the Common Channel Signaling System 7 (CCS7) network. (See Figure 1-2.) A point code is really the address that is used to transfer signaling information in the network. Routing labels of a CCS7 message use point codes to identify the origination of the message and the destination of the message.

1.04 There is a specific structure to point codes. The first 3 digits of the point code identify the network, the second 3 digits identify the cluster, and the last 3 digits identify the member. A cluster identifies groups of signaling points in a network, and a member identifies the individual signaling points within a network cluster.



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Figure 1-2. Point Code Format

1.05 In the past, 4ESS switch routing was limited to network or cluster routing. Only the first 6 digits of the point code were used. As the name implies, full point code routing uses all 9 digits of the point code. By using the full point code, a switch can route to 5,079 members. After the FPCR feature is installed, the restriction that members of a cluster must have the same routes does not apply.

1.06 E-links are installed and provisioned as a pair of link sets from an SEP to any other STP pair. The physical interface on the CNI ring for E-links is identical to the interface for A-links.

2. Call Flow (Not Affected)

3. Provisioning

3.01 The FPCR and E-Link Access features are secured features that need to be purchased. AT&T Field Support will provide provisioning instructions for these features when they are purchased.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

Measurements

- 6.01** The following new measurements have been added to the SIGNALING NETWORK PERFORMANCE REPORT - PART 1 and 2:
- The number of times traffic is diverted to a lower priority link set is collected on a link set basis as a result of either a rerouting or changeover procedure.
 - The duration (in seconds) that traffic is diverted to a lower priority link set is collected on a link set basis. The duration begins on the first occurrence of any signaling traffic being diverted from a higher priority route to this link set (that was not previously handling alternate routed traffic) and ends when no alternate routed signaling traffic is being sent to the lower priority link set. (This could be an A-link or E-link set.)

The measurements, which are reported by CNI, are collected every 5 minutes and are available on a 15 minute basis.

3B System Integrity

- 6.02** The following audits were impacted by these features:

NIDATA 1	NIDATA 1 audits the Office Identification Data, which includes a new timer, the Signal Routing Set Test (SRST) office timer.
NIDATA 4	NIDATA 4 audits CNI routing tables. Audits that were performed by NIDATA 9 are now performed by this audit.
NIDATA 9	The NIDATA 9 audit has been removed. The functions that were performed by NIDATA 9 are now performed by the NIDATA 4 audit.
NMDATA 1	Major changes were made to this audit to support the new CNI routing tables.

7. Transition Considerations

Turn On/Turn Off Mechanism

- 7.01** Since the FPCR feature and E-Link feature are secured features, the turn on procedure will be provided by AT&T Field Support when the features are purchased.

8. Input/Output Manual Pages

8.01 One new input message and one new output message were created to support these features. Several other input and output messages were modified. Tables 1-A and 1-B identify the input and output manual pages that were effected.



NOTE:

Since the manual pages affected by these features were released with the 4E18 Release 1 Generic, copies of the manual pages are not included in this document.

Table 1-A. Input Messages

Message	New/ Modified	Purpose
CLR:SRST	New	Stops the Signal Routing Set Test (SRST) for a route and sets the status of the route to available
AUD:NIDATA	Modified	Runs internal data audits on the recent-changeable tables. Modified because data table 9 was removed and changes were made to data tables 1 and 4.
AUD:NMDATA	Modified	Checks the integrity of the network management dynamic data. Modified because information was removed from AUD NMDATA 3 and audits of routing tables were added to AUD NMDATA 1.
DUMP:SMEAS	Modified	Dumps the signaling system measurements from measurement history files in a nonpaged format
OP:C7NET	Modified	Requests CNI CCS7 network routing information. A new option, ABNORMAL, was added to request a report of all routes that are available, restricted, or congested, and all subsystems that are prohibited.

Table 1-B. Output Messages

Message	New/ Modified	Purpose
CLR SRST	New	Reports that the Message Transfer Part (MTP) Signal Routing Set Test (SRST) has stopped and outputs the results of the test
AUD NIDATA 1	Modified	Reports any errors encountered while auditing the office identification data. The message has been changed to add error codes 134, 135, and 136 to the error code list.
AUD NIDATA 4	Modified	Reports any errors encountered while auditing the cluster/member routing data. This message was modified to include audits of the ccs7_pc file and the routing priority table. Also, changes were made to support some new error codes that were added and error codes that were changed.
AUD NMDATA 1	Modified	Outputs the results of the NMDATA 1 audit. This message was modified to add tables and error codes and to support some error codes that were changed.
OP C7NET	Modified	Outputs routing tables information. The format for the output of the routing data has changed to show all the routes to a point code and the status of these routes.
OP SMR	Modified	Output of the measurement reports requested by OP:SMR. The reports identify the duration and number of times traffic is diverted to a lower priority link set. (REPT SMR is the same report except it is created automatically.)
REPT CNCE	Modified	Autonomously reports CCS Network Critical Events (CNCE). The message was modified to add new CNCEs.
REPT SMR	Modified	Automatically displays new measurements for the duration and number of times traffic is diverted to a lower priority link set. These measurements are produced by the automatic measurement reports.

Advanced Intelligent Network (AIN) Dialed Number Triggers and Interactive Announcements Features (375/379)

2

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Advanced Intelligent Network (AIN) Dialed Number Triggers and Interactive Announcements Features (375/379)

2

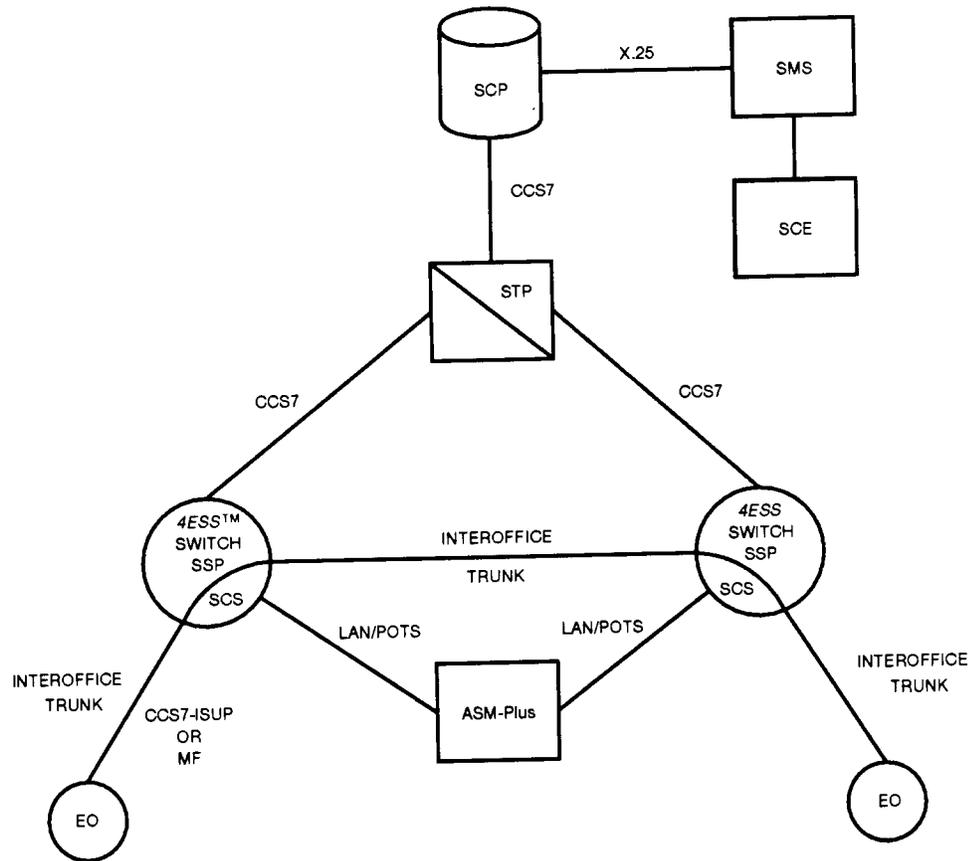
1. Feature Description

1.01 Features 375 and 379 are Local Exchange Carrier (LEC) only features for the 4E18 Release 2 and later generics. The Advanced Intelligent Network (AIN) is an industry term that is used by Bellcore to define a set of switch and network database capabilities used in the LEC environment to provide advanced services via switch and database interaction. The capabilities provided by these features are a subset of Service Switching Point functionality, as defined by Bellcore in specifications AIN 0.1 TR-NWT-001284 and TR-NWT-001285, to be provided on the 4ESS™ switch. The features build on and expand the capabilities provided by the Service Switching Point 800 feature which was introduced in 4E12.

1.02 The Advanced Intelligent Network (AIN) is a general platform from which many different services and features can be built, based on feature logic and data located at a centralized node in the network rather than in each individual switching system node. The 4ESS switch equipped to identify calls requiring database interaction and to perform the interaction is called a Service Switching Point (SSP). The database is referred to as a Service Control Point (SCP). Together, the SSP and the SCP provide various AIN services.

1.03 The Service Management System (SMS) is an operations system used to administer data in the SCP and provide other operations, administration and maintenance functions for the AIN. The Service Circuit System (SCS) is used to provide announcement capability and to perform digit collection as requested by the SCP. The Announcement System Manager—Plus (ASM-Plus) is a PC-based system which administers announcements on the SCS.

- 1.04** The Service Creation Environment (SCE) is a workstation-based system used for developing and testing new services that execute on the AIN platform.
- 1.05** The 4ESS switch already supports SSP/800 (4E12); this feature supports AIN 0.1 calls. It is important to note, however, that the SSP/800 and AIN 0.1 Transaction Capabilities Application Part (TCAP) protocols that are used between the SSP and the SCP are very different. SSP/800 calls must communicate with an SCP that supports SSP/800 TCAP, and AIN 0.1 calls must communicate with an SCP that supports AIN 0.1. AIN provides more functionality than SSP/800, enabling the LEC to provide more sophisticated AIN services.
- 1.06** This feature supports interworking with an SCP and not an intelligent peripheral or adjunct. Figure 2-1 shows a typical AIN network.
- 1.07** The SSP knows which calls require AIN services based on characteristics of the call, such as the dialed digits. The process of identifying calls that require AIN processing is known as triggering, since a particular characteristic of the call triggers the SSP into providing AIN treatment. Once a trigger occurs, a query message is sent to the SCP asking for instructions. Based on information contained in the query message, the SCP determines which service is being requested and provides appropriate information, such as routing and billing instructions that the SSP then executes to complete the call.
- 1.08** A dialed number trigger (DNT), also known as 3/6/10 triggers, is used to initiate AIN action for services based on the analysis of the dialed number or the SCP returned routing numbers.
- 1.09** Only the SCP knows which service is being performed on a particular AIN call. The SSP knows how to identify calls that require AIN processing and how to execute instructions provided by the SCP. For example, two services that are very different from the viewpoint of the subscriber and the SCP might appear identical to the SSP, since it performs the same basic functions for both.



- Legend:
- | | |
|--|------------------------------------|
| ASM-Plus - Announcement System Manager—Plus | POTS - Plain Old Telephone Service |
| CCS7 - Common Channel Signaling System 7 | SCE - Service Creation Environment |
| EO - End Office | SCP - Service Control Point |
| ISUP - Integrated Services Digital Network User Part | SCS - Service Circuit System |
| LAN - Local Area Network | SSP - Service Switching Point |
| LEC - Local Exchange Carrier | SMS - Service Management System |
| MF - Multifrequency | STP - Signal Transfer Point |

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Figure 2-1. Typical AIN Network

Example of AIN Operation

1.10 The following example illustrates the use of DNTs and the general operation of an AIN network. In this example, assume that a subscriber is a retail chain of video tape rental stores that would like to advertise a single number its customers could call to find out whether a particular video tape is available and perhaps reserve it. These calls should be routed to the store that is closest to the caller.

1.11 The subscriber and the LEC determine that 708-555-1111 will be the number to be used for this service. A directory number trigger is used for this service as the NPA-NXX of the advertised number in a central office code served by an SSP.

1.12 The subscriber and the LEC also determine the method to be used at the SCP to determine routing. In this example, the North Avenue store is open from 10:00 a.m. to 9:00 p.m. daily, while the South Avenue store is open 10:00 a.m. to 9:00 p.m. Monday through Saturday, but is closed Sundays. The subscriber would like to route the calls to the nearest store, based on the caller's central office code (NPA-NXX). However, on Sundays, all calls should go to the North Avenue store. In addition, if the calling party's number is unknown, the call should go to the North Avenue store by default.

1.13 The LEC provisions 708-555-1111 as a DNT in the appropriate SSP and provisions the service logic in the SCP via the SMS. Assume that translations in the rest of the network are already set up to route 708-555-1111 traffic to the SSP.

1.14 The call flow for this example is as follows:

1. A caller dials 708-555-1111 at 7:00 p.m. on a Friday.
2. The originating end office analyzes the call and determines that it should be routed to the 4ESS switch SSP based on the dialed NXX. Normal plain old telephone service (POTS) procedures are used to perform this routing. The calling party number (708-555-3333) is transported to the 4ESS switch SSP using Common Channel Signaling System 7—Integrated Services Digital Network User Part (CCS7-ISUP) signaling.
3. When the SSP receives the call, a DNT trigger is detected based on the routing number of 708-555-1111. The SSP sends a query message to the SCP database via the Signal Transfer Point (STP).
4. The SCP database determines that the video store service is being invoked. The service logic then examines the calling party number (708-555-3333) and the current time-of-day and day-of-week and determines that the call should be routed to the North Avenue store (708-555-4141).
5. Routing instructions are sent to the SSP with a routing number of 708-555-4141.

6. Based on the SCP-provided routing number and SSP office translations, the SSP routes the call to the office serving the North Avenue store.
 7. The POTS end office receives the call and routes it to the appropriate line.
- 1.15** The service used in this example could be modified to increase its value to the subscriber. For example, if the subscriber finds that many calls being made to 708-555-1111 concern questions about returns, extending the rental period, and so on, it might be more efficient to route these calls to different lines at each respective store. To accomplish this, the SCP service logic would be changed so that after receiving a query for calls to 708-555-1111, the following instructions would be sent to the SSP:
- Play an announcement to the caller, for example, "Please enter 1 for availability information or 2 for any other information."
 - Then collect a single digit from the caller and return that digit to the SCP.
- 1.16** The subscriber and the LEC would have to expand the routing method described to account for the new information, for cases where no digits are dialed, or for when a number other than 1 or 2 was dialed.

Secured Feature

- 1.17** Features 375 and 379 are secured within the 4E18 Release. AT&T will provide access instructions at the time the features are purchased.

Feature Capabilities

- 1.18** The features provide a number of interrelated capabilities that affect the interactions between the SSP and SCP in an AIN network as follows:
- Recognize and process shared interoffice trunk triggers
 - Recognize and process dialed number triggers (3/6/10 Triggers)
 - SCP interface via AIN 0.1 TCAP protocol (TR1285)
 - Announcements and digit collection via SCS (Feature 379)
 - Serial triggering
 - Standard Equal Access Multifrequency (EAMF) and CCS7-ISUP interfaces to other switches
 - Operations, Administration, and Maintenance (OA&M), including test queries, network load control (automatic code gapping) and new traffic measurements
 - Billing under control of the SCP with modular extended Bellcore Automatic Message Accounting (AMA) Format (EBAF).

A. Recognize and Process Shared Interoffice Trunk Triggers

1.19 Interoffice trunk groups can carry SSP 800, AIN and POTS traffic. Because of this, the SSP must be able to detect the calls that are AIN, so that it can send a query to the SCP. This capability utilizes the 0ZZ-XXX[X] portion of the EAMF signaling sequence or the Transit Network Selection (TNS) parameter of the ISUP Initial Address Message (IAM) to identify AIN calls. The possible scenarios are:

- The 0ZZ-XXX[X] (or TNS) translation indicates a Send AIN Information Collected Query. This causes the SSP to intercept the second (KP + II + ANI + ST) and the third (KP + digits + ST) stages of digits in the EAMF signaling sequence. The indicated query is sent to the SCP without any analysis of the dialed number.
- The 0ZZ-XXX[X] (or TNS) translation indicates an Analyze the II/OLI Digits. This again causes the SSP to intercept the second and third stages of EAMF digits and to check for the Send AIN Information Collected Query value. If Information Digits/Original Line Indicator (II/OLI) equals the AIN value, the Information Collected Query is sent to the SCP. If II/OLI does not equal the AIN value, the call is given reorder treatment.
- The 0ZZ-XXX[X] (or TNS) translation indicates Analyze Called Number. Once again this causes the SSP to intercept the second and third stages of EAMF digits and to proceed with digit translation, searching for DNT as described below.

B. Recognize and Process Called Number Triggers

1.20 With EAMF and ISUP Network Interconnect (NI) signaling, the only way to detect DNTs in incoming calls is through 0ZZ-XXX[X]/TNS translation, which yields the Analyze Called Number indication described above. For traditional (Feature Group C) MF or non-ISUP NI incoming calls, normal digit translation can also result in the detection of DNTs.

1.21 AIN DNTs can be defined for any number of digits in the called number from 3 through 10. The DNT defined for the longest string of digits will always be used if multiple DNTs are encountered during digit translation. For example, a DNT defined for 708-555-1212 would be used even if another trigger had been defined for 708. This means that a DNT encountered during translation must be saved, translation continued, and the last DNT detected will be used to build and send the query to the SCP.

1.22 The DNT indication is defined in addition to the normal routing information for the digit string. This allows for actual routing for the same number if it is received with the LEC carrier identification in the response from the SCP.

C. SCP Interface Via AIN 0.1 TCAP Protocol

1.23 With this feature, the interface between the SSP and the SCP in the AIN network utilizes a version of the TCAP protocol defined by Bellcore as the AIN 0.1 SSP/SCP Interface. This version of TCAP includes two query operations:

- Information Collected (for shared interoffice triggers)
- Information Analyzed (for dialed number triggers).

1.24 Other messages sent from the SSP to the SCP are:

- Resource Clear (sent after play/collect is complete)
- Termination Notification (informs SCP when the call ends, but only when requested by the SCP).

1.25 Messages from the SCP to the SSP include:

- Analyze Route (route the call)
- Disconnect (terminate the call)
- Send To Resource (play announcement/collect digits)
- Cancel Resource Event (stop noninterruptible announcement)
- Send Notification (request notification of call termination from SSP)
- Automatic Call Gap (ACG) (install network management ACG control).

D. Announcements and Digit Collection Via SCS

1.26 After the query has been sent, the SCP can request that an announcement be played and/or digits be collected by the SSP. This capability is provided by the SCS on the 4ESS switch. Refer to AT&T 234-100-130, *Service Circuit System, System Description*, for additional information on the SCS. These requests are received in Response or Conversation package types (messages).

1.27 Each 4ESS switch must be equipped with an SCS in order to support AIN interactive and customized final announcements.

1.28 When a play announcement request is received in a Response package type, the request is for a final announcement. Final announcements are not interruptible, and any digits received during the announcement are ignored. The announcement is played, and the call is disconnected.

1.29 When a play announcement and collect digits request is received in a Conversation package, the request is for interactive announcement and from 0 to 32 digits can be collected. If 0 digits is indicated, the announcement is noninterruptible,

and no digits are collected; all other interactive announcements are interruptible, and the indicated number of digits are collected. If the number of digits to collect has been specified, the collected digits are returned to the SCP in the collected digits parameter.

1.30 The SSP can request the following collection options:

- 0—Play NI announcement
- 1-32—Collect requested number of digits, 1-32
- Any—Collect any number of digits. End of digits is determined via # or interdigit timing
- Normal—Same as in Any, except the 4ESS switch translates the collected digits and determines whether an interexchange carrier was dialed. In addition, the nature of number of the address digit is derived.

1.31 When collecting the normal number of digits requested by the SCP, the SSP collects 10XXX[X] and 101XXX[X] as the leading digits and uses the XXX[X] digits to populate the carrier identification. The digits following this leading sequence may contain 0 + 7-10 digits, 01 + 7-12 digits, 011 + 7-12 digits, or 1 + 7-12 digits. The prefix digits are used to populate the nature of the number field; the remaining digits that are sent are used in the collected address information parameter. The digits 0- or 00- can also follow the leading carrier identification digits and are used to populate the nature of the number field in the collected address information with no digits.

1.32 The SSP will pass the announcements requested by the SCP directly to the SCS. There is no mapping of SCP announcements to SCS announcements.

E. Serial Triggering

1.33 Serial triggering allows multiple AIN queries to be activated for a single call. When the SCP response to a query indicates routing via the LEC, translation of the number returned by the SCP can result in the detection of another dialed number trigger. This will result in a series of operations that include the launch of another query, the receipt of another reply, etc. Up to six AIN queries (the number is specified on Recent Change Form 810) can be launched by a single SSP for a call. This multiple querying is referred to as serial triggering.

1.34 With serial triggering, up to six billing records and up to six Termination Notification messages are generated per call (one per leg, six legs per call). SSP 800 queries can be launched prior to or after an AIN query for calls routed via the LEC. These queries are not counted in the serial triggering limit.

1.35 Additional information on AIN components is available in the following AT&T publications:

- AT&T 234-100-130, *Service Circuit System, System Description*
- AT&T 201-519-012, *Announcement System Manager—Plus, User's Guide* and Chapter 5 in this document
- AT&T 270-710-010, *Service Creation Environment, System Description*.

New SCS Service Circuit

1.36 A new SCS service circuit, SVC* AIN, is used to provide customized announcements. It is defined on Office Data Administration (ODA) Form 401E; the trunks are defined on ODA Form 402G. Trunks can be added with Recent Change (RC) Form 200 or deleted with RC Form 202.

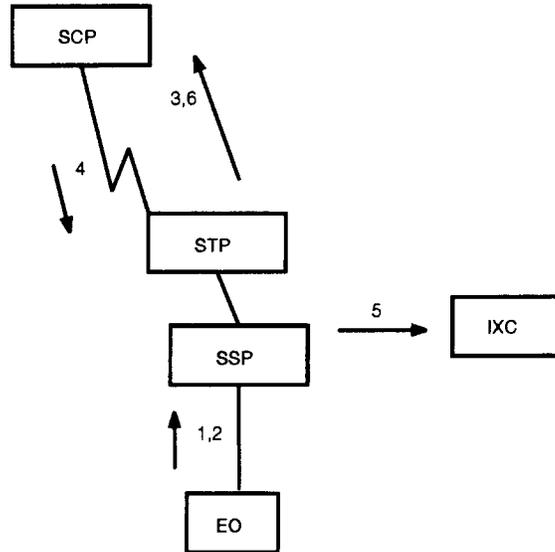
2. Call Flow

2.01 The following examples describe the call flow for an AIN call routed to an Interexchange Carrier (IXC) and for an AIN call routed via a LEC.

A. AIN Call Routed to an IXC

2.02 Figure 2-2 shows the call flow of an AIN call routed to an IXC as follows:

1. An EAMF call arrives from the end office (EO). 0ZZ-XXX[X] translation indicates Send Information Collected Query (SICQ).
2. SSP gets second stage (II + ANI) and third stage (digits) from EO.
3. SSP builds and sends the Information Collected query to the SCP.
4. SCP returns an Analyze Route response with IXC's ID, billing information, and termination notification request.
5. SSP creates AIN billing record, translates IXC's ID, and sends call to IXC.
6. When the call disconnects, SSP sends termination notification to SCP.



Legend:
 EO - End Office
 IXC - Interexchange Carrier
 SCP - Service Control Point
 SSP - Service Switching Point
 STP - Signal Transfer Point

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Figure 2-2. AIN Call Routed to IXC

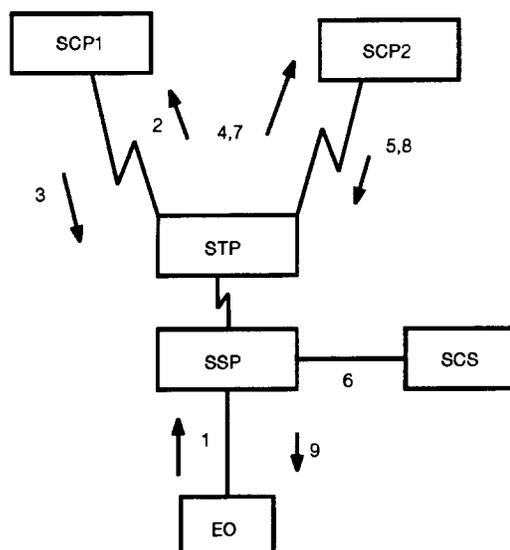
B. AIN Call Routed Via a LEC

2.03 Figure 2-3 shows the call flow of an AIN call routed via a LEC as follows:

1. Call arrives from EO via ISUP NI signaling. The SSP translates TNS resulting in the indication of Analyze Called Party Number (ACPN). SSP translation of the called number results in a DNT.
2. SSP builds and sends an Information Analyzed query to SCP 1.
3. SCP 1 sends an Analyze Route response that indicates the LEC's ID and billing information. The SSP creates an AIN billing record and translates the called party number received from SCP 1 which results in the detection of a second DNT.
4. SSP builds and sends a second Information Analyzed query, this time to SCP 2.

5. SCP 2 requests that the SCS play the announcement and collect digits.
6. SCS plays the announcement and collects digits.
7. Collected digits are returned to SCP 2 in a Resource Clear message.
8. SCP 2 sends the Analyze Route response that indicates the LEC's ID with the same dialed number previously received from SCP 1 and used in detecting this DNT along with billing information.
9. Since the number returned is the same as the number used to detect this DNT, the SSP routes the call normally to the EO and creates another AIN billing record.

2.04 Operator routing is not supported by this feature, but is expected to be available in a later release.



Legend:
 EO - End Office
 SCP - Service Control Point
 SCS - Service Circuit System
 SSP - Service Switching Point
 STP - Signal Transfer Point

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Figure 2-3. AIN Call Routed Via a LEC

3. Provisioning

3.01 Provisioning information for Features 375 and 379 is included in a Description and User's Guide manual, which will be provided at the time these secured features are purchased. Contact your 4ESS switch Account Manager for additional information.

4. Recording

AMA Record Information

4.01 Multiple Extended Bellcore AMA Format (EBAF) records can be created on a single AIN call. Each serial triggering leg can cause a single EBAF record to be created.

5. Network Management

Automatic Call Gap (ACG) Controls

5.01 For AIN service, ACG controls are placed on a global title address digits and translation type basis. For SCP overload ACG, the digit strings are always 6 in length. However, for Service Management System originated code control (SOCC), the digits can be controlled on a 3-digit or 6- through 10-digit basis for different translation types. The list supports 64 entries for each type of ACG control for a total of 128. The SOCC type of ACG takes precedence over the SCP-initiated controls for digit strings of the same length.

6. Maintenance/Troubleshooting

New Final Handling Codes

6.01 There are 39 new Final Handling Codes associated with this feature. These codes are listed in Table 2-A.

Table 2-A. Final Handling Codes

Code Number	Description
1913	Call attempted to serial trigger to the SCP more than the allowed number of times, causing the call to terminate. Simply changing the ODA value will not normally correct this problem. Call is final handled, and all associated resources are idled.
1914	Redirection indicated by the SCP would cause the call to be redirected more times than allowed by the SSP ODA. The call is final handled, and all associated resources are idled.
1915	While attempting to route the call to the carrier, the SSP detected a No Circuit condition. The SSP will attempt another carrier route. This is a Call Irregularity Report only.
2013	An AIN DNT was detected for which the call type and/or subtype were found to be invalid. This can only occur because of invalid RC or ODA. The call will be final handled, and all associated structures will be cleared.
2014	A protocol error was detected in a message that was sent or received by the 4ESS™ switch. The transaction with the SCP will be terminated. The call will be final handled, and all associated resources will be released.
2015	A protocol error was detected in a message sent or received by the SSP. The transaction with the SCP will be terminated, the call will receive final handling, and all associated resources will be released.
2016	While processing the call, an application error was detected either by the SCP or the SSP. A message has been sent if applicable. The transaction with the SCP will be terminated, the call will receive final handling, and all associated resources will be released.
2017	Initial query was returned as Unidata Service Message due to transport problems. The query was returned either by the Common Network Interface (CNI), STP or the SCP. This type of error is usually encountered due to routing problems in the CNI network. It could occur due to Global Title Translation failure, subsystem failure, network failure, etc. The TCAP transaction is terminated, the call is final handled, and all resources are idled.
2018	The DLN detected an invalid situation in the TCAP message and returned the message to the 1A/1B Processor. The TCAP transaction is terminated, the call is final handled, and all associated resources are released.

Table 2-A. Final Handling Codes (Contd)

Code Number	Description
2019	The CNI detected an invalid routing condition and returned the message to the 1A/1B Processor. The TCAP transaction is idled, the call is final handled, and all call-related resources are released.
2020	The AIN TCAP timed out while waiting for a response from the SCP. The message sent to the SCP was lost or the SCP did not respond in the time allowed for the message sent by the SSP. The TCAP transaction is terminated, the call is final handled, and all call-related resources are idled.
2021	A request was received from the SCP to final handle this call. This final handling code can be expected in the normal operation of the AIN feature. The call is final handled, and all associated resources are idled.
2022	The SCP sent a request to the SSP to play an announcement which is not present on the SCS. The call is final handled, and all transactions with the SCP are terminated. All call associated resources are released.
2023	An invalid call type was detected while attempting to route the call on carrier information received from the SCP. The call will receive final handling, transactions with the SCP are terminated, and all call associated resources are idled.
2024	An invalid operation was detected while processing a TCAP response from the SCP. The transaction with the SCP is terminated, and all associated resources are released.
2025	While attempting to send an AIN TCAP initial query to the SCP, a CNI send buffer overflow condition was detected. The call is final handled, and all associated resources are idled. The transaction will not be terminated at the SCP because the 4ESS switch is unable to send a message to the SCP. The transaction will be terminated at the SCP because of time-out.
2026	A stream down condition was detected while attempting to send the message to the SCP, causing the message not to be sent. The call is terminated.
2027	Call encountered AIN SMS Originated Code Controls prior to sending query to the SCP. A check of the control list determined that this call should be terminated. The call is terminated, and all associated resources are idled.

Table 2-A. Final Handling Codes (Contd)

Code Number	Description
2028	Prior to sending query to the SCP, a check of the SCP overload ACG control list indicated that the call should be controlled. The call is final handled, and all associated resources are released.
2029	A protocol error was detected while parsing a TCAP message from the SCP. The call is final handled, and all associated resources are idled. The TCAP transaction is terminated, and the SCP is informed if necessary.
2030	Bad data was detected in the TCAP parameter received from the SCP. The call is final handled, and (if applicable) the transaction with the SCP is terminated.
2031	An AIN call was attempted at a 4ESS switch that has not purchased this feature. The call is final handled, and all associated resources are released.
2032	Call was determined to be an AIN data call (no carrier ID available). Data calls are not allowed or supported by AIN. The call will receive the ODA final handling treatment or the default Reorder Announcement.
2033	Call was determined to be an AIN call (no carrier ID available), but the internal call type translations specified an incompatible SSP AIN subtype. The call is given final handling treatment or the default Reorder Announcement.
2034	Call was determined to be an AIN data call (carrier ID available). Data calls are not allowed or supported by AIN. The call will receive the ODA final handling treatment or the default Reorder Announcement.
2035	Call was determined to be an AIN call (carrier ID available), but the internal call type translations specified an incompatible SSP AIN subtype. The call will receive the ODA final handling treatment or the default Reorder Announcement.
2036	After an initial database query, translations specified an incompatible SSP AIN subtype. The call will receive the ODA final handling treatment or the default Reorder Announcement.
2037	Before an initial database query, an incompatible call type was detected while translating the called party number. The call will be given the ODA final handling treatment or the default Reorder Announcement.
2038	No DNT was detected when translating or analyzing the called party number that resulted in a routing data block (RDB) call type. The call will receive the ODA final handling treatment or the default Reorder Announcement.

Table 2-A. Final Handling Codes (Contd)

Code Number	Description
2039	Before an initial database query, there are no II or OLI digits to analyze. The call will receive the ODA final handling treatment or the default Reorder Announcement.
2040	Before an initial database query, the II or OLI digits did not correspond to a valid AIN call. The call will receive the ODA final handling treatment or the default Reorder Announcement.
2041	After an initial database query, the routing digits translated into an illegal call type for AIN. The call will receive the ODA final handling treatment or the default Reorder Announcement.
2042	After an initial database query, no routing digits were provided by the database. The call will receive the ODA final handling treatment or the default Reorder Announcement.
2043	After an initial database query, an invalid AIN trigger type was encountered. The call will receive the ODA final handling treatment or the default Reorder Announcement.
2044	The DNT and corresponding called party number are identical to the previously stored DNT and called party number which caused the original database query; there is no routing available for this call. The call will receive the ODA final handling treatment or the default Reorder Announcement.
2045	The number of routing digits received is unacceptable according to the corresponding call type translations. The call will receive the ODA final handling treatment or the default Reorder Announcement.
2046	For a Network Services Routing (NSR) call, the corresponding call type translation was nondeterminant. The call will receive the ODA final handling treatment or the default Reorder Announcement.
2047	A nonfatal exception occurred while processing the call. This exception is noncall affecting, and the call need not be finaled. Call processing will continue. The 4ESS switch will perform appropriate actions depending on the situation in which the call irregularity occurs.

New Traffic/Plant Measurements

6.02 Table 2-B lists and defines the new traffic/plant measurements required to support this feature. The measurements are listed in the same order they appear in the output report.

Table 2-B. New Traffic/Plant Measurements

Count	Definition
INC	The AIN Calls Received From Another Switch (INC) count is pegged for all AIN calls that have been received from another switch (that is, the AIN call did not originate on this SSP switch).
QRYS	The AIN Queries Sent to the SCP (QRYS) count is pegged for each query that is sent to the SCP. This is the total amount of queries sent and can be incremented more than once for each AIN call attempt.
NMBLK	Regardless of the type of Network Management (NM) control, the Network Management Control Blocks Call (NMBLK) count is pegged on every occurrence of an AIN query blocked at the SSP due to an NM control. This count can be pegged due to the following reasons: <ul style="list-style-type: none"> ■ An SCP overload automatic code gap (ACG) control ■ An SCP overload manual automatic code gap (MACG) control ■ An SMS originated code control (SOCC) ■ A POTS destination code control. <p>This count is not pegged when a call is blocked after the SCP has provided routing instructions.</p>
FAIL-CP-BIQ	The Call Processing Failure Before Initial Query (FAIL-CP-BIQ) count is pegged when an AIN call is terminated before the query to the SCP is sent. The reason for an AIN call being terminated could either be because of a hardware or software initialization or a failure in the normal call processing routine. Any call processing failure that can be detected by the SSP is counted under this failure.
UNAVAIL-BIQ	The Resource Unavailable Before Initial Query (UNAVAIL-BIQ) count is pegged when an AIN call fails because a resource, which is normally provided by the SSP, is unavailable because of maintenance or engineering reasons before the query to the SCP is sent. The resources might either be engineerable or might be fixed internally via the switch software release.
RSP-MSG	The Normal Route Response Message Received (RSP-MSG) count is pegged when a route response is received from the SCP on AIN calls.
PLAY-ANN	The Play Announcement Messages from the SCP (PLAY-ANN) count is pegged when a play announcement message is received from the SCP.

Table 2-B. New Traffic/Measurements (Contd)

Count	Definition
RETREJ	The Return Error or Reject Message (RETREJ) count is pegged when the SSP receives a Return Error message or a Reject message in response to a Query or Conversation message. A Return Error message is returned from the SCP for an invalid command sent from the SSP. The Reject message is returned from the SCP for a valid command sent from the SSP that is either incomplete or out of sequence.
SIG-FAIL-TD	The Signaling Failure Time-out at SSP (SIG-FAIL-TD) count is pegged when the SSP times out while waiting for a reply from the SCP.
ABDNBO	The Abandon Before Outpulsing (ABDNBO) count is pegged when an on-hook is received from the calling party before the SSP receives and interprets a routing response. This includes the case where the caller abandons during a play announcement and collect digits operation.
ABDNAO	The Abandon After Outpulsing (ABDNAO) count is pegged when an on-hook is received from the calling party while the SSP is processing an SCP route response.
TN-REC	The Termination Requests Received (TN-REC) count represents the number of Termination Notification requests received from the SCP.
INVLD	The Invalid Command Sequence (INVLD) count is pegged when the SSP receives a response from the SCP that contains an incomplete or out-of-sequence valid command. In other words, the SSP receives a valid command from the SCP, but its order or completeness, with reference to the current dialogue sequence, is incorrect.
INVLD-CMD	The Invalid Command Message (INVLD-CMD) count is pegged when the SSP receives a response from the SCP that is undecipherable or has bad data.
TRIG-OVFL	The Serial Triggering Limit Overflowed (TRIG-OVFL) measurement represents the number of times the office-administrable, serial-triggering limit has been overflowed or exhausted.
FAIL-CP-AIQ	The Call Processing Failure After Initial Query (FAIL-CP-AIQ) count is pegged when an AIN call is terminated after the query is sent. The reason for an AIN call being terminated could either be because of a hardware or software initialization or a failure in the normal call processing routine. A call processing failure that can be detected by the SSP is counted under this failure. This count indicates a more serious event than the FAIL-CP-BIQ one because of the waste in resources.

Table 2-B. New Traffic/Measurements (Contd)

Count	Definition
UNAVAIL-AIQ	The Resource Unavailable After Initial Query (UNAVAIL-AIQ) count is pegged when an AIN call fails because a resource, which is normally provided by the SSP, is unavailable because of maintenance or engineering reasons after the query to the SCP is sent. This count indicates a more serious event than the UNAVAIL-BIQ one because of the waste in resources.
TN-RET	The Termination Notification Response (TN-RET) count represents the number of Termination Notification responses sent to the SCP.
RECREGINST	This is the number of recording registers installed.
RECREGSEIZ	This is the number of recording registers seized in the last 15 minutes.
RECREGUSAG	This is the recording register usage in Common Channel Signaling (CCS). It is determined by adding the number of registers in use every 100 seconds.

6.03 Figure 2-4 shows an example of a typical measurement report.

```

16 REPT:MEASREPT 1 MSG COMPL
  NPVL IL IH IMD    PRIM MTC
  SAT 01/08/94 ACCUMULATION TIME SAT 1500 - SAT 1515
  LAST MEASREPT CHANGE 01/08/94
  MSC 49 INWATS, OUTWATS, BSSP, DIRECT SIGNALING AND ACI
  OMS 1 AIN CALLS
  -- AIN ORIGINATIONS --
      INC
      9

----- PRE-SCP RESPONSE -----
  QRY5    NMBLK    FAIL-CP-BIQ    UNAVAIL-BIQ
      20         0         0         0

----AWAITING/RECEIVED SCP RSPONSE ----
  RSP-MSG  PLAY-ANN  RETREJ    SIG-FAIL-TD
      15         10         0         0

--- ABANDON ---    --- TN INFO ---
  ABDNBO  ABDNAO      TN-REC
      0         0         5

-----UNABLE TO COMPLETE-----
  INVLD    INVLD-CMD  TRIG-OVFL  FAIL-CP-AIQ  UNAVAIL-AIQ
      0         0         0         0         0

OMS 2 DIRECT SIGNALING
  MISROUTED
  MSGS RCVD
      0
- SADC MESSAGES -
  TOTAL    UNX
      0     0
  TERM  NTFY
  MSGS  LOST
      0
  1A-3B AMA RECORDS
  SENT    LOST
      3     0
  AIN TN INFO
  TN-RET
      5

01/08/94 15:16:05
#996

```

Figure 2-4. Typical Measurements Report

7. Transition Considerations

Turn On/Off Mechanism

7.01 These features are secured and are turned on only by ODA. Additional provisioning is described in the Description and User's Guide for Features 375 and 379, which is provided at the time the features are purchased. Provisioning of the SCP and other AIN network components is also required. Contact your 4ESS switch Account Manager for additional information.

8. Input/Output Manual Pages

8.01 The following new Input and Output Manual Pages for 4E18 Release 2 and 4E19 Release 2 Generics support this feature:

- Input - TEST:TCAPAIN
- Output - TEST:TCAPAIN

8.02 The following modified Input and Output Manual Pages for 4E18 Release 2 and 4E19 Release 2 Generics support this feature:

- Input - VER:AIN-LIST
- Output - VER:AIN-LIST
- Output - VER:CODEGRP-3
- Output - VER:CODEGRP-6
- Output - VER:CODEGRP-9
- Output - VER:CODEGRP-12
- Output - VER:MEMORY-EM

ID TEST:TCAPAIN
WORK CENTER.. MAC, MOC, NMOC, TOC
GENERIC 4E18 Rel. 2 and later
CLASS ALL
APPLICATION .. 4E
TYPE Input

1. PURPOSE

Requests a test query to be sent to the service control point (SCP) from the 4ESS™ Switch serving as a service switching point (SSP). This test query will enable office personnel, via input messages, to initiate queries to verify the contents of specific fields in the SCP response message. This test query tests the integrity of the common channel signaling system 7 (CCS7) network between the two end points utilizing the American National Standard Institute (ANSI) based transaction capability application part (TCAP) protocol. It also serves as a tool to test the data for a particular advanced intelligent network (AIN) customer. The queries sent to the SCP can be either for Info_Collected or Info_Analyzed.

2. FORMAT

To request an Info_Analyzed test query:

```
[1]  TEST:TCAPAIN;QRYTYPE a:TSGN b,DATA c,TRNUM d
      ,DIG e,TOS f[,ANI g][,SID h][,OLI i |,IIDIGITS j]
      [,RID k][,RDC l][,AUTHCODE m][,TIME n][,CD][,LIST]!
```

To request an Info_Collected test query:

```
[2]  TEST:TCAPAIN;QRYTYPE a:TSGN b,DATA c,ANI g
      ,DIG o,TOS f[,SID h][,OLI i |,IIDIGITS j]
      [,RID k][,RDC l][,AUTHCODE m][,TIME n][,CD][,LIST]!
```

3. EXPLANATION OF MESSAGE

- a The type of query to be sent:
 - 1 — Info_Collected query
 - 2 — Info_Analyzed query
- b The USERID contains the identity of the originating user which is the trunk subgroup number (TSGN).
- c The bearer capability of the call that encountered the trigger:
 - 0 — Speech
 - 1 — f31kHz audio
 - 2 — 7kHz audio, (NOT SUPPORTED)
 - 3 — b56kbps, (NOT SUPPORTED)
 - 4 — b64kbps, (NOT SUPPORTED)

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- 5 — Packet mode data, (NOT SUPPORTED)
- d Trigger criteria type:
- 0 — Feature activator, (NOT SUPPORTED)
 - 1 — Vertical service code, (NOT SUPPORTED)
 - 2 — Customized access, (NOT SUPPORTED)
 - 3 — Customized intercom, (NOT SUPPORTED)
 - 4 — Numbering plan area (NPA)
 - 5 — NPANXX
 - 6 — Exchange number (NXX)
 - 7 — NXXxxxx, where x is the final four digits of a number
 - 8 — NPANXXxxxx, where x is the final four digits of a number
 - 9 — Country code NPANXXxxxx, (NOT SUPPORTED), where x is the final four digits of a number
 - 10 — Carrier access, (NOT SUPPORTED)
 - 11 — Prefixes, (NOT SUPPORTED)
 - 12 — n11, (NOT SUPPORTED), where n is a decimal number (2-9).
 - 13 — aFR, (NOT SUPPORTED)
 - 14 — Shared IO trunk, (NOT SUPPORTED)
 - 15 — Termination attempt, (NOT SUPPORTED)
 - 16 — Off hook immediate, (NOT SUPPORTED)
 - 17 — Off hook delay, (NOT SUPPORTED)
 - 18 — Channel setup primary rate interface (PRI), (NOT SUPPORTED)
 - 19 — NPAN
 - 20 — NPANX
 - 21 — NPANXXx, where x is a decimal number (0-9).
 - 22 — NPANXXxx, where x is a decimal number (0-9).
 - 23 — NPANXXxxx, where x is a decimal number (0-9).
 - 24 — Network busy, (NOT SUPPORTED)
- e Called party identification (ID) represents the call's destination address. This parameter includes the nature of number along with the numbering plan, followed by the digits. Range: 3,6,7,10-15 digits.

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Nature of number (first two digits)

- 00 — Not applicable, (NOT SUPPORTED)
- 01 — Subscriber number
- 02 — National (significant) number
- 03 — International number
- 04 — Subscriber number, operator requested (0+ call)
- 05 — National number, operator requested (0+ call)
- 06 — International number, operator requested (0+ call)
- 07 — No address present, operator requested (0-, 10xxx+0(0), or 00- call), where x is a decimal number (0-9), (NOT SUPPORTED).
- 08 — No address present, cut-through call to carrier
- 09 — 950+ call from local exchange carrier public station or hotel/motel line or non-equal access end office (EAEO)
- 10 — Test line test code

Numbering plan (third digit)

- 0 — Unknown or not applicable, (NOT SUPPORTED)
- 1 — Integrated services digital network (ISDN) numbering plan
- 2 — Private

For example:

EX: 0121234567
Nature of number: Subscriber number
Numbering plan: Private
Digits: 1234567

- f Type of service (TOS) indicator is used to obtain the transaction type to use in sending the query (0-31).
- g Charge number represents the billing number automatic number identification (ANI) of the call's originating party. Range: 3,6,10 digits.
- h Calling party ID represents the call's originating party. This parameter includes the nature of number, numbering plan, presentation restriction, screening indicator, followed by the digits. Range: 3,6,10-15.

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Nature of number (first digit)

- 0 — Unknown or not applicable
- 1 — Unique subscriber number
- 2 — Unique national (significant) number
- 3 — Unique international number
- 4 — Non-unique subscriber number
- 5 — Non-unique national number
- 6 — Non-unique international number
- 7 — Test line test code

Numbering plan (second digit)

- 0 — Unknown or not applicable
- 1 — ISDN numbering plan
- 2 — Private

Presentation restriction indicator (PRI) - screening indicator (SI) (third digit)

- 0 — Presentation allowed - reserved for user provided, not screened or spare
- 1 — Presentation allowed - user provided, passed network screening
- 2 — Presentation allowed - network provided
- 3 — Presentation restricted - reserved for user provided, not screened or spare
- 4 — Presentation restricted - user provided, passed network screening
- 5 — Presentation restricted - network provided
- 6 — Number unavailable - reserved for user provided, not screened or spare
- 7 — Number unavailable - user provided, passed network screening
- 8 — Number unavailable - network provided

For example:

EX: 1081234567
Nature of number: Unique subscriber number
Numbering plan: Unknown or not applicable
PRI-SI: Number unavailable -
network provided
Digits: 1234567

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- i Charge party station type represents the originating line information (OLI) of the call's originating party. Range: 0...99.
- j Charge party station type represents the information digits (II) of the call's originating party. Range: 0...99.
- k Redirecting party ID represents the dialed number of the last station for which call forwarding was invoked. This parameter includes the nature of number, numbering plan, presentation restriction, screening indicator, followed by the digits. Range: 3,6,10-15 Digits

Nature of number (first digit)

- 0 — Unknown or not applicable
- 1 — Unique subscriber number
- 2 — Unique national (significant) number
- 3 — Unique international number
- 4 — Non-unique subscriber number
- 5 — Non-unique national number
- 6 — Non-unique international number
- 7 — Test line test code

Numbering plan (second digit)

- 0 — Unknown or not applicable
- 1 — ISDN numbering plan
- 2 — Private

Presentation restriction indicator (PRI) - screening indicator (SI) (third digit)

- 0 — Presentation allowed - reserved for user provided, not screened or spare
- 3 — Presentation restricted - reserved for user provided, not screened or spare
- 6 — Number unavailable - reserved for user provided, not screened or spare

For example:

EX: 1067081234567
Nature of number: Unique subscriber number
Numbering plan: Unknown or not applicable
PRI-SI: Number unavailable - reserved for user provided, not screened or spare
Digits: 7081234567

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- 1 Redirection information reflects the information about the call forwarding which has occurred on the call. It is only meaningful if the call has encountered call forwarding (either switch-based, or SCP initiated via forward_Call) before encountering a trigger. The redirection information parameter contains the following fields:
- Original Redirection Reason — Field reflects the reason the first call forwarding action was taken.
 - Redirection Reason — Field reflects the reason the most recent call forwarding action was taken.
 - Redirection Counter — Keeps count of the number of call forwarding actions which have occurred on the call. It is incremented each time SCP initiated forwarding occurs.

Original redirection reason (first digit)

- 0 — Unknown/ not available
- 1 — User busy
- 2 — No reply
- 3 — Unconditional

Redirection reason (second digit)

- 0 — Unknown/ not available
- 1 — User busy
- 2 — No reply
- 3 — Unconditional

Redirection counter (third and fourth digit) Range: 01-10

- m Original called party ID represents the call's destination address. This parameter includes the nature of number, numbering plan, presentation restrictions, and screening indicator, followed by the digits. Range: 3,6,10-15.

Nature of number (first digit)

- 0 — Unknown or not applicable
- 1 — Unique subscriber number
- 2 — Unique national (significant) number
- 3 — Unique international number
- 4 — Non-unique subscriber number
- 5 — Non-unique national number

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- 6 — Non-unique international number
- 7 — Test line test code

Numbering plan (second digit)

- 0 — Unknown or not applicable
- 1 — ISDN numbering plan
- 2 — Private

Presentation restriction indicator (PRI) - screening indicator (SI) (third digit)

- 0 — Presentation allowed - reserved for user provided, not screened or spare
- 1 — Presentation allowed - user provided, passed network screening
- 2 — Presentation allowed - network provided
- 3 — Presentation restricted - reserved for user provided, not screened or spare
- 4 — — Presentation restricted - user provided, passed network screening
- 5 — Presentation restricted - network provided
- 6 — Number unavailable - reserved for user provided, not screened or spare
- 7 — Number unavailable - user provided, passed network screening
- 8 — Number unavailable - network provided

For example:

EX: 1081234567
Nature of number: Unique subscriber number
Numbering plan: Unknown or not applicable
PRI-SI: Number unavailable -
network provided
Digits: 1234567

- n Sets the T1 timer for waiting reply. If not specified the default will be the value normally used for call processing messages. Range: 01-10.
- o Collected address information contains the "untranslated" address information collected from the originating trunk. This parameter includes the nature of number along with the numbering plan, followed by the digits. Range: 0-15 digits.

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Nature of number (first two digits)

- 00 — Not applicable
- 01 — Subscriber number
- 02 — National (significant) number
- 03 — International number
- 04 — Subscriber number, operator requested (0+ call)
- 05 — National number, operator requested (0+ call)
- 06 — International number, operator requested (0+ call)
- 07 — No address present, operator requested (0-, 10XXX+0(0), or 00- call)
- 08 — No address present, cut-through call to carrier
- 09 — 950+ call from local exchange carrier public station or hotel/motel line or non-EAEO
- 10 — Test line test code

Numbering plan (third digit)

- 0 — Unknown or not applicable
- 1 — ISDN numbering plan
- 2 — Private

For example:

EX: 0127081234567
Nature of number: Subscriber number
Numbering plan: Private
Digits: 7081234567

- CD** Continue data is used when there is too much data for one line a second test query has to be entered with the remaining data.
- LIST** Used to dump the message received from the signaling control point (SCP) database.

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The Info_Analyzed message is a switch event message. It is sent from the SSP to the SCP. The trigger detection point associated with this message is information analyzed.

The follow description will show the valid use of parameters for the Info_Analyzed message:

InfoAnalyzed OPERATION	
PARAMETER	Designation
UserID (TSGN)	MANDATORY
BearerCapability (DATA)	MANDATORY
CalledPartyID (DIG)	MANDATORY
Lata (LATA)	NOT SUPPORTED
TriggerCriteriaType (TRNUM)	MANDATORY
ChargeNumber (ANI)	OPTIONAL
CallingPartyID (SID)	OPTIONAL
ChargePartyStationType (OLI or IIDIGITS)	OPTIONAL
PrimaryCarrier	NOT SUPPORTED
CollectedAddressInfo	NOT SUPPORTED
CollectedDigits	NOT SUPPORTED
VerticalServiceCode	NOT SUPPORTED
TCM	NOT SUPPORTED
OriginalCalledPartyID	OPTIONAL
RedirectingPartyID	OPTIONAL
RedirectionInformation	OPTIONAL
ACGEncountered	NOT SUPPORTED

The Info_Collected message is a switch event message. It is sent from the SSP to the SCP. The trigger detection point associated with this message is information collected.

The follow description will show the valid use of parameters for the Info_Collected message:

InfoCollected OPERATION	
PARAMETER	Designation
UserID (TSGN)	MANDATORY
BearerCapability (DATA)	MANDATORY
ChargeNumber (ANI)	MANDATORY
Lata (LATA)	NOT SUPPORTED
PrimaryCarrier	NOT SUPPORTED
TriggerCriteriaType (TRNUM)	NOT SUPPORTED
continued next page	

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InfoCollected OPERATION	
PARAMETER	Designation
CallingPartyID (SID)	OPTIONAL
ChargePartyStationType (OLI or IIDIGITS)	OPTIONAL
AccessCode	NOT SUPPORTED
CollectedAddressInfo	MANDATORY
CollectedDigits	NOT SUPPORTED
VerticalServiceCode	NOT SUPPORTED
TCM	NOT SUPPORTED
OriginalCalledPartyID	OPTIONAL
RedirectingPartyID	OPTIONAL
RedirectionInformation	OPTIONAL
ACGEncountered	NOT SUPPORTED
Amp	NOT SUPPORTED

4. SYSTEM RESPONSE

- ?D, CODE 1 Data field error. Keyword entered twice in input.
- ?D, CODE 2 Data field error. Input parameter not allowed in send info collected query (SICQ).
- ?D, CODE 3 Data field error. Input parameter not allowed or all mandatory parameters not entered in SICQ.
- ?D, CODE 4 Data field error. All mandatory parameters not entered in send info analyzed query (SIAQ).
- ?D, CODE 5 Data field error. Invalid query type detected.
- ?D, CODE 6 Data field error. Invalid user ID detected.
- ?D, CODE 7 Data field error. Invalid bearer capability detected.
- ?D, CODE 8 Data field error. LATA not supported.
- ?D, CODE 9 Data field error. Invalid T1 timer detected.
- ?D, CODE 11 Data field error. Invalid collected address info digit count detected.
- ?D, CODE 12 Data field error. Nature should be cut to carrier for a zero digit collected address info parameter.
- ?D, CODE 13 Data field error. Invalid trigger criteria type detected.
- ?D, CODE 14 Data field error. Invalid called party ID digit count detected.
- ?D, CODE 15 Data field error. Invalid called party ID nature of number detected.
- ?D, CODE 16 Data field error. Invalid called party ID numbering plan detected.
- ?D, CODE 17 Data field error. Invalid calling party ID digit count detected.
- ?D, CODE 18 Data field error. Invalid calling party ID nature of number detected.

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?D, CODE 19	Data field error. Invalid calling party ID numbering plan detected.
?D, CODE 21	Data field error. Invalid charge party station type detected.
?D, CODE 22	Data field error. IIDIGITS and OLI both input.
?D, CODE 23	Data field error. Invalid original called processor ID (PID) digit count detected.
?D, CODE 24	Data field error. Invalid original called PID nature of number detected.
?D, CODE 25	Data field error. Invalid original called PID numbering plan detected.
?D, CODE 26	Data field error. Invalid original called PID presentation/screening detected.
?D, CODE 27	Data field error. Invalid redirection PID digit count detected.
?D, CODE 28	Data field error. Invalid redirection PID nature of number detected.
?D, CODE 29	Data field error. Invalid redirection PID numbering plan detected.
?D, CODE 31	Data field error. Invalid redirection information original redirection reason detected.
?D, CODE 32	Data field error. Invalid redirection information redirection reason detected.
?D, CODE 33	Data field error. Invalid redirection information redirection count detected.
?D, CODE 34	Data field error. Invalid redirection information digit count detected.
?D, CODE 35	Data field error. Invalid type of service detected.
?D, CODE 36	Data field error. Unrecognized keyword.
?D, CODE 37	Data field error. Invalid charge number digit count detected.
?D, CODE 38	Data field error. Invalid calling party ID presentation/screening indicator detected.
?D, CODE 39	Data field error. Invalid redirection PID presentation/screening indicator detected.
?D, CODE 41	Data field error. The TMAD0005 pident found errors.
?E	Syntax error. An invalid keyword combination was discovered.
PF, CODE 0	Printout follows. Teletypewriter (TTY) message accepted and sent.
PF, CODE 1	Printout follows. TTY message accepted waiting further input.
RL, CODE 2	Retry later. Unable to seize a trunk maintenance register (TMR).
RL, CODE 3	Retry later. Previous test in progress.
RL, CODE 4	Retry later. Terminal congestion.
RL, CODE 5	Retry later. Signaling link failure.

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RL, CODE	6	Retry later. Audit condition detected in link security.
RL, CODE	7	Retry later. Response timing could not be initiated.
RL, CODE	8	Retry later. System overload.
RL, CODE	9	Retry later. Stream down.
RL, CODE	11	Retry later. Buffer overflow.

5. REFERENCES

PIDENT
AINTMESH
AINTTEST
IOCPIMC4
TMAD0005

Output Message
TEST:TCAPAIN

SEE PROPRIETARY NOTICE ON COVER PAGE

ID TEST:TCAPAIN
WORK CENTER.. MAC, MOC, NMOC, TOC
GENERIC 4E19 Rel. 2 and later
CLASS ALL
APPLICATION .. 4E
TYPE Input

1. PURPOSE

Requests a test query to be sent to the service control point (SCP) from the 4ESS™ Switch serving as a service switching point (SSP). This test query will enable office personnel, via input messages, to initiate queries to verify the contents of specific fields in the SCP response message. This test query tests the integrity of the common channel signaling system 7 (CCS7) network between the two end points utilizing the American National Standard Institute (ANSI) based transaction capability application part (TCAP) protocol. It also serves as a tool to test the data for a particular advanced intelligent network (AIN) customer. The queries sent to the SCP can be either for Info_Collected or Info_Analyzed.

2. FORMAT

To request an Info_Analyzed test query:

[1] **TEST:TCAPAIN;QRYTYPE a:TSGN b,DATA c,TRNUM d
,DIG e,TOS f[,ANI g][,SID h][,OLI i |,IIDIGITS j]
[,RID k][,RDC l][,AUTHCODE m][,TIME n][,CD][,LIST]!**

To request an Info_Collected test query:

[2] **TEST:TCAPAIN;QRYTYPE a:TSGN b,DATA c,ANI g
,DIG o,TOS f[,SID h][,OLI i |,IIDIGITS j]
[,RID k][,RDC l][,AUTHCODE m][,TIME n][,CD][,LIST]!**

3. EXPLANATION OF MESSAGE

- a The type of query to be sent:
- 1 — Info_Collected query
 - 2 — Info_Analyzed query
- b The USERID contains the identity of the originating user which is the trunk subgroup number (TSGN).
- c The bearer capability of the call that encountered the trigger:
- 0 — Speech
 - 1 — f31kHz audio
 - 2 — 7kHz audio, (NOT SUPPORTED)
 - 3 — b56kbps, (NOT SUPPORTED)
 - 4 — b64kbps, (NOT SUPPORTED)

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- d
- 5 — Packet mode data, (NOT SUPPORTED)
- Trigger criteria type:
- 0 — Feature activator, (NOT SUPPORTED)
 - 1 — Vertical service code, (NOT SUPPORTED)
 - 2 — Customized access, (NOT SUPPORTED)
 - 3 — Customized intercom, (NOT SUPPORTED)
 - 4 — Numbering plan area (NPA)
 - 5 — NPANXX
 - 6 — Exchange number (NXX)
 - 7 — NXXxxxx, where x is the final four digits of a number
 - 8 — NPANXXxxxx, where x is the final four digits of a number
 - 9 — Country code NPANXXxxxx, (NOT SUPPORTED), where x is the final four digits of a number
 - 10 — Carrier access, (NOT SUPPORTED)
 - 11 — Prefixes, (NOT SUPPORTED)
 - 12 — n11, (NOT SUPPORTED), where n is a decimal number (2-9).
 - 13 — aFR, (NOT SUPPORTED)
 - 14 — Shared IO trunk, (NOT SUPPORTED)
 - 15 — Termination attempt, (NOT SUPPORTED)
 - 16 — Off hook immediate, (NOT SUPPORTED)
 - 17 — Off hook delay, (NOT SUPPORTED)
 - 18 — Channel setup primary rate interface (PRI), (NOT SUPPORTED)
 - 19 — NPAN
 - 20 — NPANX
 - 21 — NPANXXx, where x is a decimal number (0-9).
 - 22 — NPANXXxx, where x is a decimal number (0-9).
 - 23 — NPANXXxxx, where x is a decimal number (0-9).
 - 24 — Network busy, (NOT SUPPORTED)
- e
- Called party identification (ID) represents the call's destination address. This parameter includes the nature of number along with the numbering plan, followed by the digits. Range: 3,6,7,10-15 digits.

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Nature of number (first two digits)

- 00 — Not applicable, (NOT SUPPORTED)
- 01 — Subscriber number
- 02 — National (significant) number
- 03 — International number
- 04 — Subscriber number, operator requested (0+ call)
- 05 — National number, operator requested (0+ call)
- 06 — International number, operator requested (0+ call)
- 07 — No address present, operator requested (0-, 10xxx+0(0), or 00- call), where x is a decimal number (0-9), (NOT SUPPORTED).
- 08 — No address present, cut-through call to carrier
- 09 — 950+ call from local exchange carrier public station or hotel/motel line or non-equal access end office (EAEO)
- 10 — Test line test code

Numbering plan (third digit)

- 0 — Unknown or not applicable, (NOT SUPPORTED)
- 1 — Integrated services digital network (ISDN) numbering plan
- 2 — Private

For example:

EX: 0121234567
Nature of number: Subscriber number
Numbering plan: Private
Digits: 1234567

- f Type of service (TOS) indicator is used to obtain the transaction type to use in sending the query (0-31).
- g Charge number represents the billing number automatic number identification (ANI) of the call's originating party. Range: 3,6,10 digits.
- h Calling party ID represents the call's originating party. This parameter includes the nature of number, numbering plan, presentation restriction, screening indicator, followed by the digits. Range: 3,6,10-15.

SEE PROPRIETARY NOTICE ON COVER PAGE

Nature of number (first digit)

- 0 — Unknown or not applicable
- 1 — Unique subscriber number
- 2 — Unique national (significant) number
- 3 — Unique international number
- 4 — Non-unique subscriber number
- 5 — Non-unique national number
- 6 — Non-unique international number
- 7 — Test line test code

Numbering plan (second digit)

- 0 — Unknown or not applicable
- 1 — ISDN numbering plan
- 2 — Private

Presentation restriction indicator (PRI) - screening indicator (SI) (third digit)

- 0 — Presentation allowed - reserved for user provided, not screened or spare
- 1 — Presentation allowed - user provided, passed network screening
- 2 — Presentation allowed - network provided
- 3 — Presentation restricted - reserved for user provided, not screened or spare
- 4 — Presentation restricted - user provided, passed network screening
- 5 — Presentation restricted - network provided
- 6 — Number unavailable - reserved for user provided, not screened or spare
- 7 — Number unavailable - user provided, passed network screening
- 8 — Number unavailable - network provided

For example:

EX: 1081234567
Nature of number: Unique subscriber number
Numbering plan: Unknown or not applicable
PRI-SI: Number unavailable -
network provided
Digits: 1234567

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- i Charge party station type represents the originating line information (OLI) of the call's originating party. Range: 0...99.
- j Charge party station type represents the information digits (II) of the call's originating party. Range: 0...99.
- k Redirecting party ID represents the dialed number of the last station for which call forwarding was invoked. This parameter includes the nature of number, numbering plan, presentation restriction, screening indicator, followed by the digits. Range: 3,6,10-15 Digits

Nature of number (first digit)

- 0 — Unknown or not applicable
- 1 — Unique subscriber number
- 2 — Unique national (significant) number
- 3 — Unique international number
- 4 — Non-unique subscriber number
- 5 — Non-unique national number
- 6 — Non-unique international number
- 7 — Test line test code

Numbering plan (second digit)

- 0 — Unknown or not applicable
- 1 — ISDN numbering plan
- 2 — Private

Presentation restriction indicator (PRI) - screening indicator (SI) (third digit)

- 0 — Presentation allowed - reserved for user provided, not screened or spare
- 3 — Presentation restricted - reserved for user provided, not screened or spare
- 6 — Number unavailable - reserved for user provided, not screened or spare

For example:

EX: 1067081234567
Nature of number: Unique subscriber number
Numbering plan: Unknown or not applicable
PRI-SI: Number unavailable -
reserved for user provided,
not screened or spare
Digits: 7081234567

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- 1 Redirection information reflects the information about the call forwarding which has occurred on the call. It is only meaningful if the call has encountered call forwarding (either switch-based, or SCP initiated via forward_Call) before encountering a trigger. The redirection information parameter contains the following fields:
- Original Redirection Reason — Field reflects the reason the first call forwarding action was taken.
 - Redirection Reason — Field reflects the reason the most recent call forwarding action was taken.
 - Redirection Counter — Keeps count of the number of call forwarding actions which have occurred on the call. It is incremented each time SCP initiated forwarding occurs.

Original redirection reason (first digit)

- 0 — Unknown/ not available
- 1 — User busy
- 2 — No reply
- 3 — Unconditional

Redirection reason (second digit)

- 0 — Unknown/ not available
- 1 — User busy
- 2 — No reply
- 3 — Unconditional

Redirection counter (third and fourth digit) Range: 01-10

- m Original called party ID represents the call's destination address. This parameter includes the nature of number, numbering plan, presentation restrictions, and screening indicator, followed by the digits. Range: 3,6,10-15.

Nature of number (first digit)

- 0 — Unknown or not applicable
- 1 — Unique subscriber number
- 2 — Unique national (significant) number
- 3 — Unique international number
- 4 — Non-unique subscriber number
- 5 — Non-unique national number

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- 6 — Non-unique international number
- 7 — Test line test code

Numbering plan (second digit)

- 0 — Unknown or not applicable
- 1 — ISDN numbering plan
- 2 — Private

Presentation restriction indicator (PRI) - screening indicator (SI) (third digit)

- 0 — Presentation allowed - reserved for user provided, not screened or spare
- 1 — Presentation allowed - user provided, passed network screening
- 2 — Presentation allowed - network provided
- 3 — Presentation restricted - reserved for user provided, not screened or spare
- 4 — — Presentation restricted - user provided, passed network screening
- 5 — Presentation restricted - network provided
- 6 — Number unavailable - reserved for user provided, not screened or spare
- 7 — Number unavailable - user provided, passed network screening
- 8 — Number unavailable - network provided

For example:

EX: 1081234567
Nature of number: Unique subscriber number
Numbering plan: Unknown or not applicable
PRI-SI: Number unavailable -
network provided
Digits: 1234567

- n Sets the T1 timer for waiting reply. If not specified the default will be the value normally used for call processing messages. Range: 01-10.
- o Collected address information contains the "untranslated" address information collected from the originating trunk. This parameter includes the nature of number along with the numbering plan, followed by the digits. Range: 0-15 digits.

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Nature of number (first two digits)

- 00 — Not applicable
- 01 — Subscriber number
- 02 — National (significant) number
- 03 — International number
- 04 — Subscriber number, operator requested (0+ call)
- 05 — National number, operator requested (0+ call)
- 06 — International number, operator requested (0+ call)
- 07 — No address present, operator requested (0-, 10XXX+0(0), or 00- call)
- 08 — No address present, cut-through call to carrier
- 09 — 950+ call from local exchange carrier public station or hotel/motel line or non-EAEO
- 10 — Test line test code

Numbering plan (third digit)

- 0 — Unknown or not applicable
- 1 — ISDN numbering plan
- 2 — Private

For example:

EX: 0127081234567
Nature of number: Subscriber number
Numbering plan: Private
Digits: 7081234567

- CD** Continue data is used when there is too much data for one line a second test query has to be entered with the remaining data.
- LIST** Used to dump the message received from the signaling control point (SCP) database.

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The Info_Analyzed message is a switch event message. It is sent from the SSP to the SCP. The trigger detection point associated with this message is information analyzed.

The follow description will show the valid use of parameters for the Info_Analyzed message:

InfoAnalyzed OPERATION	
PARAMETER	Designation
UserID (TSGN)	MANDATORY
BearerCapability (DATA)	MANDATORY
CalledPartyID (DIG)	MANDATORY
Lata (LATA)	NOT SUPPORTED
TriggerCriteriaType (TRNUM)	MANDATORY
ChargeNumber (ANI)	OPTIONAL
CallingPartyID (SID)	OPTIONAL
ChargePartyStationType (OLI or IIDIGITS)	OPTIONAL
PrimaryCarrier	NOT SUPPORTED
CollectedAddressInfo	NOT SUPPORTED
CollectedDigits	NOT SUPPORTED
VerticalServiceCode	NOT SUPPORTED
TCM	NOT SUPPORTED
OriginalCalledPartyID	OPTIONAL
RedirectingPartyID	OPTIONAL
RedirectionInformation	OPTIONAL
ACGEncountered	NOT SUPPORTED

The Info_Collected message is a switch event message. It is sent from the SSP to the SCP. The trigger detection point associated with this message is information collected.

The follow description will show the valid use of parameters for the Info_Collected message:

InfoCollected OPERATION	
PARAMETER	Designation
UserID (TSGN)	MANDATORY
BearerCapability (DATA)	MANDATORY
ChargeNumber (ANI)	MANDATORY
Lata (LATA)	NOT SUPPORTED
PrimaryCarrier	NOT SUPPORTED
TriggerCriteriaType (TRNUM)	NOT SUPPORTED
continued next page	

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InfoCollected OPERATION	
PARAMETER	Designation
CallingPartyID (SID)	OPTIONAL
ChargePartyStationType (OLI or IIDIGITS)	OPTIONAL
AccessCode	NOT SUPPORTED
CollectedAddressInfo	MANDATORY
CollectedDigits	NOT SUPPORTED
VerticalServiceCode	NOT SUPPORTED
TCM	NOT SUPPORTED
OriginalCalledPartyID	OPTIONAL
RedirectingPartyID	OPTIONAL
RedirectionInformation	OPTIONAL
ACGEncountered	NOT SUPPORTED
Amp	NOT SUPPORTED

4. SYSTEM RESPONSE

- ?D, CODE 1 Data field error. Keyword entered twice in input.
- ?D, CODE 2 Data field error. Input parameter not allowed in send info collected query (SICQ).
- ?D, CODE 3 Data field error. Input parameter not allowed or all mandatory parameters not entered in SICQ.
- ?D, CODE 4 Data field error. All mandatory parameters not entered in send info analyzed query (SIAQ).
- ?D, CODE 5 Data field error. Invalid query type detected.
- ?D, CODE 6 Data field error. Invalid user ID detected.
- ?D, CODE 7 Data field error. Invalid bearer capability detected.
- ?D, CODE 8 Data field error. LATA not supported.
- ?D, CODE 9 Data field error. Invalid T1 timer detected.
- ?D, CODE 11 Data field error. Invalid collected address info digit count detected.
- ?D, CODE 12 Data field error. Nature should be cut to carrier for a zero digit collected address info parameter.
- ?D, CODE 13 Data field error. Invalid trigger criteria type detected.
- ?D, CODE 14 Data field error. Invalid called party ID digit count detected.
- ?D, CODE 15 Data field error. Invalid called party ID nature of number detected.
- ?D, CODE 16 Data field error. Invalid called party ID numbering plan detected.
- ?D, CODE 17 Data field error. Invalid calling party ID digit count detected.
- ?D, CODE 18 Data field error. Invalid calling party ID nature of number detected.

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?D, CODE 19	Data field error. Invalid calling party ID numbering plan detected.
?D, CODE 21	Data field error. Invalid charge party station type detected.
?D, CODE 22	Data field error. IIDIGITS and OLI both input.
?D, CODE 23	Data field error. Invalid original called processor ID (PID) digit count detected.
?D, CODE 24	Data field error. Invalid original called PID nature of number detected.
?D, CODE 25	Data field error. Invalid original called PID numbering plan detected.
?D, CODE 26	Data field error. Invalid original called PID presentation/screening detected.
?D, CODE 27	Data field error. Invalid redirection PID digit count detected.
?D, CODE 28	Data field error. Invalid redirection PID nature of number detected.
?D, CODE 29	Data field error. Invalid redirection PID numbering plan detected.
?D, CODE 31	Data field error. Invalid redirection information original redirection reason detected.
?D, CODE 32	Data field error. Invalid redirection information redirection reason detected.
?D, CODE 33	Data field error. Invalid redirection information redirection count detected.
?D, CODE 34	Data field error. Invalid redirection information digit count detected.
?D, CODE 35	Data field error. Invalid type of service detected.
?D, CODE 36	Data field error. Unrecognized keyword.
?D, CODE 37	Data field error. Invalid charge number digit count detected.
?D, CODE 38	Data field error. Invalid calling party ID presentation/screening indicator detected.
?D, CODE 39	Data field error. Invalid redirection PID presentation/screening indicator detected.
?D, CODE 41	Data field error. The TMAD0005 pident found errors.
?E	Syntax error. An invalid keyword combination was discovered.
PF, CODE 0	Printout follows. Teletypewriter (TTY) message accepted and sent.
PF, CODE 1	Printout follows. TTY message accepted waiting further input.
RL, CODE 2	Retry later. Unable to seize a trunk maintenance register (TMR).
RL, CODE 3	Retry later. Previous test in progress.
RL, CODE 4	Retry later. Terminal congestion.
RL, CODE 5	Retry later. Signaling link failure.

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RL, CODE	6	Retry later. Audit condition detected in link security.
RL, CODE	7	Retry later. Response timing could not be initiated.
RL, CODE	8	Retry later. System overload.
RL, CODE	9	Retry later. Stream down.
RL, CODE	11	Retry later. Buffer overflow.

5. REFERENCES

PIDENT
AINTMESH
AINTTEST
IOCPIMC4
TMAD0005

Output Message
TEST:TCAPAIN

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ID VER:AIN-LIST
WORK CENTER .. MAC, MOC
GENERIC 4E18 Rel. 2 and later
CLASS VER
APPLICATION .. 4E
TYPE Input

1. PURPOSE

To display the code group domain, area code indicator, and type of service index associated with the advanced intelligent network (AIN) trigger.

2. FORMAT

VER:AIN:LIST a!

3. EXPLANATION OF MESSAGE

AIN Advanced intelligent network.
a Trigger number (1-8191), which may be a single number, a list (a, a, . . .), a range, a-a, or a combination of a range and a list of announcement numbers. A list or a combination must be enclosed in parentheses.

4. SYSTEM RESPONSE

PF Printout follows. Followed by a VER:AIN-LIST output message.
NA Not accepted.

5. REFERENCES

PIDENTs
IOCPIMC4
VRFYCNTL
VRFYINPT
VRFYOUT
VRFYRTNG

Translation Guide, 4ESS™, TG-4, Division 8, Section 13T

Output Message
VER:AIN-LIST

SEE PROPRIETARY NOTICE ON COVER PAGE

ID VER:AIN-LIST
WORK CENTER.. MAC, MOC
GENERIC 4E19 Rel. 2 and later
CLASS VER
APPLICATION .. 4E
TYPE Input

1. PURPOSE

To display the code group domain, area code indicator, and type of service index associated with the advanced intelligent network (AIN) trigger.

2. FORMAT

VER:AIN:LIST a!

3. EXPLANATION OF MESSAGE

AIN	Advanced intelligent network.
a	Trigger number (1-8191), which may be a single number, a list (a,a,...), a range, a-a, or a combination of a range and a list of announcement numbers. A list or a combination must be enclosed in parentheses.

4. SYSTEM RESPONSE

PF	Printout follows. Followed by a VER:AIN-LIST output message.
NA	Not accepted.

5. REFERENCES

PIDENTs
IOCPIMC4
VRFYCNTL
VRFYINPT
VRFYOUT
VRFYRTNG

Translation Guide, 4ESS™, TG-4, Division 8, Section 13T

Output Message
VER:AIN-LIST

SEE PROPRIETARY NOTICE ON COVER PAGE

ID TEST:TCAPAIN
WORK CENTER . . MAC, MOC, NMOC, TOC
GENERIC 4E18 Rel. 2 and later
APPLICATION . . 4E
TYPE Output

1. FORMAT

An Info_Analyzed test query:

[1] TEST:TCAPAIN;QRYTYPE a[:TSGN b,DATA c,TRNUM d,TOS e,DIG f]
[,ANI g][,SID h][,OLI i | ,IIDIGITS j][,RID k][,RDC l][,TIME m]...
... [LIST][,CD][,AUTHCODE n]

[OPERATION: o
PARAMETERS: p]
[v]

An Info_Collected test query:

[2] TEST:TCAPAIN;QRYTYPE a[:TSGN b,DATA c,TOS e,ANI g,DIG u]
[,SID h] [,OLI i | ,IIDIGITS j] [,RID k] [,RDC l][,TIME m]...
... [LIST][,CD][,AUTHCODE n]

[OPERATION: o
PARAMETERS: p]
[v]

2. REASON FOR OUTPUT

This output message is in response to the TEST:TCAPAIN input message, which requests either an Info_Analyzed or Info_Collected query.

The variable field o explains the results of the test query (whether successful or not). Variable p gives information to support the results.

3. VARIABLE FIELD DEFINITIONS

- a Type of query sent:
- 1 — Info_Collected query
 - 2 — Info_Analyzed query
- b The USERID contains the identity of the originating user which is the trunk subgroup number (TSGN).
- c The bearer capability of the call that encountered the trigger. The service switch point (SSP) shall include the bearer capability parameter in the message regardless of the originating access type as follows:
- 0 — Speech

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- 1 — f31kHz audio
- 2 — 7kHz audio, (NOT SUPPORTED)
- 3 — b56kbps, (NOT SUPPORTED)
- 4 — b64kbps, (NOT SUPPORTED)
- 5 — Packet mode data, (NOT SUPPORTED)

d

Trigger criteria type:

- 0 — Feature activator, (NOT SUPPORTED)
- 1 — Vertical service code, (NOT SUPPORTED)
- 2 — Customized access, (NOT SUPPORTED)
- 3 — Customized intercom, (NOT SUPPORTED)
- 4 — Numbering plan area (NPA)
- 5 — NPANXX
- 6 — Exchange number (NXX)
- 7 — NXXxxxx, where xxxx is the final four digits of the number.
- 8 — NPANXXxxxx, where xxxx is the final four digits of the number.
- 9 — Country code NPANXXxxxx, (NOT SUPPORTED), where xxxx is the final four digits of the number.
- 10 — Carrier access, (NOT SUPPORTED)
- 11 — Prefixes , (NOT SUPPORTED)
- 12 — n11, (NOT SUPPORTED), where n is a decimal number (2-9).
- 13 — aFR, (NOT SUPPORTED)
- 14 — Shared input/output (IO) trunk, (NOT SUPPORTED)
- 15 — Termination attempt, (NOT SUPPORTED)
- 16 — Off hook immediate (NOT SUPPORTED)
- 17 — Off hook delay, (NOT SUPPORTED)
- 18 — Channel setup primary rate interference (PRI), (NOT SUPPORTED)
- 19 — NPAN
- 20 — NPANX
- 21 — NPANXXx , where n is a decimal number (0-9).

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- 22 — NPANXXxx , where n is a decimal number (0-9).
- 23 — NPANXXxxx , where n is a decimal number (0-9).
- 24 — Network busy, (NOT SUPPORTED)

e Type of service (TOS) indicator is used to obtain the transaction type to use in sending the query.

f Called party identification (ID) represents the call's destination address. This parameter includes the nature of number along with the numbering plan, followed by the digits.

Nature of number (first two digits)

- 00 — Not applicable
- 01 — Subscriber number
- 02 — National (significant) number
- 03 — International number
- 04 — Subscriber number, operator requested (0+ call)
- 05 — National number, operator requested (0+ call)
- 06 — International number, operator requested (0+ call)
- 07 — No address present, operator requested (0-, 10XXX+0(0), or 00- call)
- 08 — No address present, cut-through call to carrier
- 09 — 950+ call from local exchange carrier public station or hotel/motel line or non-equal access end office (EAEO)
- 10 — Test line test code

Numbering plan (third digit)

- 0 — Unknown or not applicable
- 1 — Integrated services digital network (ISDN) numbering plan
- 2 — Private

For example:

EX: 0121234567
Nature of number: Subscriber number
Numbering plan: Private
Digits: 1234567

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- g Charge number represents the billing number automatic number identification (ANI) of the call's originating party. Range: 3,6,10 digits.
- h Calling party ID represents the call's originating party. This parameter includes the nature of number, numbering plan, presentation restriction, screening indicator, followed by the digits.

Nature of number (first digit)

- 0 — Unknown or not applicable
- 1 — Unique subscriber number
- 2 — Unique national (significant) number
- 3 — Unique international number
- 4 — Non-unique subscriber number
- 5 — Non-unique national number
- 6 — Non-unique international number
- 7 — Test line test code

Numbering plan (second digit)

- 0 — Unknown or not applicable
- 1 — ISDN numbering plan
- 2 — Private

Presentation restriction indicator (PRI) - screening indicator (SI) (third digit)

- 0 — Presentation allowed - reserved for user provided, not screened or spare
- 1 — Presentation allowed - user provided, passed network screening
- 2 — Presentation allowed - network provided
- 3 — Presentation restricted - reserved for user provided, not screened or spare
- 4 — Presentation restricted - user provided, passed network screening
- 5 — Presentation restricted - network provided
- 6 — Number unavailable - reserved for user provided, not screened or spare

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- 7 — Number unavailable - user provided, passed network screening
- 8 — Number unavailable - network provided

For example:

EX: 1081234567
Nature of number: Unique subscriber number
Numbering plan: Unknown or not applicable
PRI-SI: Number unavailable -
network provided
Digits: 1234567

- i Charge party station type represents the originating line information (OLI) of the call's originating party. Range: 0...99.
- j Charge party station type represents the information digits (II) of the call's originating party. Range: 0...99.
- k Redirecting party ID represents the dialed number of the last station for which call forwarding was invoked. It is only meaningful if the call has encountered call forwarding (either switched-based, or signaling control point (SCP) initiated via forward_call) before encountering a trigger. This parameter includes the nature of number, numbering plan, presentation restriction, screening indicator, followed by the digits.

Nature of number (first digit)

- 0 — Unknown or not applicable
- 1 — Unique subscriber number
- 2 — Unique national (significant) number
- 3 — Unique international number
- 4 — Non-unique subscriber number
- 5 — Non-unique national number
- 6 — Non-unique international number
- 7 — Test line test code

Numbering plan (second digit)

- 0 — Unknown or not applicable
- 1 — ISDN numbering plan
- 2 — Private

SEE PROPRIETARY NOTICE ON COVER PAGE

Presentation restriction indicator (PRI) - screening indicator (SI) (third digit)

- 0 — Presentation allowed - reserved for user provided, not screened or spare
- 3 — Presentation restricted - reserved for user provided, not screened or spare
- 6 — Number unavailable - reserved for user provided, not screened or spare

For example:

EX: 1067081234567
Nature of number: Unique subscriber number
Numbering plan: Unknown or not applicable
PRI-SI: Number unavailable - reserved for user provided, not screened or spare
Digits: 7081234567

1

Redirection information reflects the information about the call forwarding which has occurred on the call. It is only meaningful if the call has encountered call forwarding (either switch-based, or SCP initiated via forward_call) before encountering a trigger. The redirection information parameter contains the following fields:

- Original Redirection Reason — Field reflects the reason the first call forwarding action was taken.
- Redirection Reason — Field reflects the reason the most recent call forwarding action was taken.
- Redirection Counter — Keeps count of the number of call forwarding actions which have occurred on the call. It is incremented each time SCP initiated forwarding occurs.

Original redirection reason (first digit)

- 0 — Unknown/ not available
- 1 — User busy
- 2 — No reply
- 3 — Unconditional

Redirection reason (second digit)

- 0 — Unknown/ not available
- 1 — User busy

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- 2 — No reply
- 3 — Unconditional

Redirection counter (third and fourth digit). Range: 01-10

- m Sets the T1 timer for waiting reply. If not specified the default will be the value normally used for call processing messages.
- CD Continue data is used when there is too much data for one line a second test query had to be entered with the remaining data.
- LIST Used to dump the message received from the SCP database.
- n Original called party ID represents the call's destination address. This parameter remains unchanged, representing the actual original called party number, after it is set by the first forwarding action encountered by the call. It continues to reflect the original destination address of the call, and can not be overwritten. This parameter includes the nature of number, numbering plan, presentation restrictions, and screening indicator, followed by the digits. Range: 3,6,10-15 digits.

Nature of number (first digit)

- 0 — Unknown or not applicable
- 1 — Unique subscriber number
- 2 — Unique national (significant) number
- 3 — Unique international number
- 4 — Non-unique subscriber number
- 5 — Non-unique national number
- 6 — Non-unique international number
- 7 — Test line test code

Numbering plan (second digit)

- 0 — Unknown or not applicable
- 1 — ISDN numbering plan
- 2 — Private

SEE PROPRIETARY NOTICE ON COVER PAGE

Presentation restriction indicator (PRI) - screening indicator (SI) (third digit)

- 0 — Presentation allowed - reserved for user provided, not screened or spare
- 1 — Presentation allowed - user provided, passed network screening
- 2 — Presentation allowed - network provided
- 3 — Presentation restricted - reserved for user provided, not screened or spare
- 4 — Presentation restricted - user provided, passed network screening
- 5 — Presentation restricted - network provided
- 6 — Number unavailable - reserved for user provided, not screened or spare
- 7 — Number unavailable - user provided, passed network screening
- 8 — Number unavailable - network provided

For example:

EX: 1081234567
Nature of number: Unique subscriber number
Numbering plan: Unknown or not applicable
PRI-SI: Number unavailable -
network provided
Digits: 1234567

- o The output from this test query indicates whether the query was successful or not:

ANALYZE ROUTE
CONTINUE
DISCONNECT
SEND TO RESOURCE

- p The following text phrases may appear when the query succeeds:

If variable o is ANALYZE ROUTE then:

CHARGE NUMBER qqq qqq qqqq NAT: 0xrr PLAN: 0xs
CALLING PARTY ID qqq qqq qqqq NAT: 0xrr PLAN:0xs
CHARGE PARTY STATION TYPE rr

SEE PROPRIETARY NOTICE ON COVER PAGE

CALLED PARTY ID qqq qqq qqqq NAT: 0xrr PLAN: 0xs
PRIMARY CARRIER qqqq
ALTERNATE CARRIER qqqq
SECOND ALTERNATE CARRIER qqqq
REDIRECTING PARTY ID qqq qqq qqqq NAT: 0xrr PLAN:0xs
PRIMARY BILLING INDICATOR CALL TYPE: qqq SFI: qqq
ALTERNATE BILLING INDICATOR CALL TYPE: qqq SFI: qqq
SECOND ALTERNATE BILLING INDICATOR CALL TYPE: qqq ...
...SFI: qqq
OVERFLOW BILLING INDICATOR CALL TYPE: qqq SFI: qqq
AMA ALTERNATE BILLING NUMBER qqq qqq qqqq NAT: 0xrr ...
...PLAN: 0xs
AMA BUSINESS CUSTOMER ID qqq qqq qqqq NAT: 0xrr ...
...PLAN: 0xs
AMA LINE NUMBER: qqq qqq qqqq NAT: 0xrr PLAN: 0xs
AMA SLP ID qqqqqqqqq
AMA DIGITS DIALED WC qqq qqq qqqq NAT: 0xrr PLAN: 0xs

If variable o is CONTINUE then:

PRIMARY BILLING INDICATOR CALL TYPE: qqq SFI: qqq
AMA ALTERNATE BILLING NUMBER qqq qqq qqqq NAT: 0xrr ...
...PLAN: 0xs
AMA BUSINESS CUSTOMER ID qqq qqq qqqq NAT: 0xrr ...
...PLAN: 0xs
AMA LINE NUMBER: qqq qqq qqqq NAT: 0xrr PLAN: 0xs
AMA SLP ID qqqqqqqqq
AMA DIGITS DIALED WC qqq qqq qqqq NAT: 0xrr PLAN: 0xs

SEE PROPRIETARY NOTICE ON COVER PAGE

If variable o is DISCONNECT then:

PRIMARY BILLING INDICATOR CALL TYPE: qqq SFI: qqq
AMA ALTERNATE BILLING NUMBER qqq qqq qqqq NAT: 0xrr ...
...PLAN: 0xs
AMA BUSINESS CUSTOMER ID qqq qqq qqqq NAT: 0xrr ...
...PLAN: 0xs
AMA LINE NUMBER: qqq qqq qqqq NAT: 0xrr PLAN: 0xs
AMA SLP ID qqqqqqqqq
AMA DIGITS DIALED WC qqq qqq qqqq NAT: 0xrr PLAN: 0xs

If variable o is SEND TO RESOURCE then:

RESOURCE TYPE q
STR PARAMETER BLOCK:
ANNOUNCEMENT: 37
MAX DIGITS: t
DISCONNECT FLAG # PRESENT = DISCONNECT LEG
ABSENT = DO NOT DISCONNECT LEG
ANSWER INDICATOR # PRESENT = RETURN ANSWER ...
...SUPERVISION
ABSENT = DO NOT RETURN ANSWER ...
...SUPERVISION
PRIMARY BILLING INDICATOR CALL TYPE: qqq SFI: qqq
AMA ALTERNATE BILLING NUMBER qqq qqq qqqq NAT: 0xrr ...
...PLAN: 0xs
AMA BUSINESS CUSTOMER ID qqq qqq qqqq NAT: 0xrr ...
...PLAN: 0xs
AMA LINE NUMBER: qqq qqq qqqq NAT: 0xrr PLAN: 0xs
AMA SLP ID qqqqqqqqq
AMA DIGITS DIALED WC qqq qqq qqqq NAT: 0xrr PLAN: 0xs

SEE PROPRIETARY NOTICE ON COVER PAGE

- q Decimal number (0-9).
- r Nature of number:
 For called parameters in hexadecimal:
- 00 — Not applicable
 - 01 — Subscriber number
 - 03 — National (significant) number
 - 04 — International number
 - 71 — Subscriber number, operator requested (0+ call)
 - 72 — National number, operator requested (0+ call)
 - 73 — International number, operator requested (0+ call)
 - 74 — No address present, operator requested (0-,10xxx+0(0), or 00-call), where x is a decimal number (0-9)
 - 75 — No address present, cut-through call to carrier
 - 76 — 950+ call from local exchange carrier public station or hotel/motel line or non-EAEO
 - 77 — Test line test code

For calling parameter in hexadecimal:

- 00 — Unknown or not applicable, default
- 01 — Unique subscriber number
- 03 — Unique national (significant) number
- 04 — Unique international number
- 71 — Non-unique subscriber number
- 73 — Non-unique national number
- 74 — Non-unique international number
- 77 — Test line test code

For charge number parameters in hexadecimal:

- 01 — Ani of the calling party; subscriber number
- 02 — Ani not available or not provided
- 03 — Ani of the calling party; national number
- 05 — Ani of the called party included; subscriber number
- 06 — Ani of the called party not included
- 07 — Ani of the called party included; national number

SEE PROPRIETARY NOTICE ON COVER PAGE

- s Numbering plan for calling, called, and charge number parameters:
- 0 — Unknown or not applicable
 - 1 — ISDN numbering plan
 - 5 — Private
- t Collection type indication (MAX DIGITS):
- 0 — Not present
 - 1-32 — Fixed number of digits
 - 253 — Normal number of digits
 - 254 — Any number of digits
- u Collected address information contains the "untranslated" address information collected from the originating trunk. This parameter includes the nature of number along with the numbering plan, followed by the digits.
- Nature of number (first two digits)
- 00 — Not applicable
 - 01 — Subscriber number
 - 02 — National (significant) number
 - 03 — International number
 - 04 — Subscriber number, operator requested (0+ call)
 - 05 — National number, operator requested (0+ call)
 - 06 — International number, operator requested (0+ call)
 - 07 — No address present, operator requested (0-, 10XXX+0(0), or 00- call)
 - 08 — No address present, cut-through call to carrier
 - 09 — 950+ call from local exchange carrier public station or hotel/motel line or non-EAEO
 - 10 — Test line test code
- Numbering plan (third digit)
- 0 — Unknown or not applicable
 - 1 — ISDN numbering plan
 - 2 — Private

SEE PROPRIETARY NOTICE ON COVER PAGE

For example:

EX: 0127081234567
Nature of number: Subscriber number
Numbering plan: Private
Digits: 7081234567

NOTE: The following is a list of parameters:

CALLING PARAMETERS— Calling parameters include: automatic message accounting (AMA) business customer ID, AMA business customer ID, AMA line number, calling party ID, original called party ID, and redirecting party ID.

CALLED PARAMETERS— Called parameters include: access code, AMA digits dialed WC, called party ID, collected address info, collected digits, lata, outpulse number, traveling class mark (TCM), and vertical service code.

CHARGE NUMBER PARAMETERS— Charge number parameters include the AMA alternate billing number and charge number.

v

Exception code:

- 1 — Unrecognized package type in received transaction capability application part (TCAP) message.
- 2 — Transaction ID not present in package for which a transaction ID (TID) was expected.
- 3 — Incorrect transaction portion.
- 4 — Badly structured component portion.
- 5 — Unrecognized component type.
- 6 — Unrecognize operation code error.
- 7 — Incorrect component portion error.
- 8 — Badly structured component portion.
- 9 — Missing mandatory parameter detected.
- 10 — Advanced intelligent network (AIN) TCAP message returned by common network interface (CNI).
- 11 — AIN TCAP message returned by direct link node (DLN).
- 12 — Unitdata service message received.
- 13 — Received protocol abort (PABORT) message with cause indicating unrecognized package type.

SEE PROPRIETARY NOTICE ON COVER PAGE

- 14 — Received PABORT message with cause indicating incorrect transaction portion.
- 15 — Received PABORT message indicating unrecognized transaction ID.
- 16 — Received PABORT indicating permanent timeout release.
- 17 — Received PABORT indicating resources unavailable.
- 18 — Received reject message indicating cause general. Unrecognized component.
- 19 — Received reject message indicating cause general. Incorrect component portion.
- 20 — Received reject message indicating cause general. Badly structured component portion.
- 21 — Received reject message indicating cause invoke. Duplicate invoke ID.
- 22 — Received reject message indicating cause invoke. Unrecognized operation code.
- 23 — Received reject message indicating cause invoke. Incorrect parameter.
- 24 — Received reject message indicating cause invoke. Unrecognized correlation ID.
- 25 — Received reject message indicating cause return result. Unrecognized correlation ID.
- 26 — Received reject message indicating cause return result. Unexpected return result.
- 27 — Received reject message indicating cause return result. Incorrect parameter.
- 28 — Received reject message indicating return error. Unrecognized correlation ID.
- 29 — Received reject message indicating return error. Unexpected return error.
- 30 — Received reject message indicating return error. Unrecognized error code.
- 31 — Received reject message indicating return error. Unexpected error.
- 32 — Received reject message indicating return error. Incorrect parameter.
- 33 — Received return result message.
- 34 — Unexpected caller interaction message sequence error.

SEE PROPRIETARY NOTICE ON COVER PAGE

- 35 — Unexpected connection control message sequence error.
- 36 — Invalid opcode family detected.
- 37 — Invalid opcode specifier for caller interaction family.
- 38 — Invalid opcode specifier for connection control family.
- 39 — Invalid opcode specifier for information request family.
- 40 — Invalid opcode specifier for network management family.
- 41 — Invalid opcode specifier for send notification family.
- 42 — Invalid opcode specifier for abnormal family.
- 43 — Invalid request for connection control operation after call finalized.
- 44 — Connection control operation received in an invalid package type.
- 45 — Connection control. Continue operation received for call which has not received AIN count.
- 46 — Invalid redirection digits received in connection control operation.
- 47 — Exceeded redirection count of valid redirections.
- 48 — Invalid charge number parameter received in connection control operation.
- 49 — Invalid calling party number (CPN) digits parameter received in connection control operation.
- 50 — Invalid called digits parameter received in connection control operation.
- 51 — Invalid carrier digits parameter received in connection control operation.
- 52 — Invalid cut-through to carrier request in connection control operation.
- 53 — Connection control operation subroutine called but no connection control command found.
- 54 — Invalid request for termination notification data after call has been finalized.
- 55 — Invalid request for termination notification information.
- 56 — Invalid request for caller interaction operation after call has been finalized.
- 57 — Invalid resource type received in response package.

SEE PROPRIETARY NOTICE ON COVER PAGE

- 58 — Disconnect flag not received in caller interaction in response package.
- 59 — Announcement type received in response package was invalid.
- 60 — Announcement received in response package not provisioned.
- 61 — No circuit condition detected when circuit hunt attempted for caller interaction (CI) in response package.
- 62 — Invalid resource type received in conversation package.
- 63 — Invalid disconnect flag detected for play collect in conversation package.
- 64 — Invalid send to resource type detected in conversation package.
- 65 — Invalid value of MAX DIGITS in caller interaction operation.
- 66 — No announcement received in conversation package for caller interaction command.
- 67 — Announcement received not provisioned.
- 68 — Disconnect flag received in play resource type in conversation package.
- 69 — No circuit condition detected when circuit hunt attempted for CI in conversation package.
- 70 — Monitor for change operation received in invalid package type.
- 71 — Update request received in invalid package type.
- 72 — Caller abandon condition occurred.
- 73 — Timeout while waiting for response from AIN SCP.
- 74 — Invalid transaction ID detected.
- 75 — Invalid AIN state condition detected.
- 76 — Mandatory parameter not received.
- 77 — Parameter received out of sequence.
- 78 — Invalid action detected in parse table.
- 79 — Default error in operation of abnormal. Report error.
- 80 — Error of erroneous data in operation of abnormal. Report error.

SEE PROPRIETARY NOTICE ON COVER PAGE

- 81 — Error of missing conditional parameter in operation of abnormal. Report error.
- 82 — Error of response message timer expired in operation of abnormal. Report error.
- 83 — Error of unexpected communication in operation of abnormal. Report error.
- 84 — Error of unexpected message in operation of abnormal. Report error.
- 85 — Error of unexpected message sequence in operation of abnormal. Report error.
- 86 — Error of unexpected parameter sequence in operation of abnormal. Report error.
- 87 — Unrecognized problem type detected in reject component.
- 88 — Unrecognized problem code in type general.
- 89 — Unrecognized problem code in type invoke.
- 90 — Unrecognized problem code in type return result.
- 91 — Unrecognized problem code in type transaction portion.
- 92 — Problem code in reject indicates unrecognized package type.
- 93 — Problem code in reject indicates incorrect transaction portion.
- 94 — Problem code in reject indicates badly structured transaction portion.
- 95 — Problem code in reject indicates unrecognized transaction ID.
- 96 — Unexpected message application error detected.
- 97 — Default error in return error.
- 98 — Error of erroneous data in return error.
- 99 — Error of missing conditional parameter in return error.
- 100 — Error of response message timer expired in return error.
- 101 — Error of unexpected communication in return error.
- 102 — Error of unexpected message in return error.
- 103 — Error of unexpected message sequence in return error.

SEE PROPRIETARY NOTICE ON COVER PAGE

- 104 — Error of unexpected parameter sequence in return error.
- 105 — Return result component received.
- 106 — Too many digits received in digits parameter.
- 107 — Invalid number of digits detected in charge number.
- 108 — Invalid number of digits detected in calling party ID parameter.
- 109 — Invalid nature detected in called number parameter.
- 110 — Invalid digit count detected in received national number.
- 111 — Invalid called digit count.
- 112 — Invalid AMA digits detected.
- 113 — Request for cancel after call has been final handled.
- 114 — Request for cancel operation received in invalid package type.
- 115 — Request to cancel received while playing final announcement.
- 116 — Request to cancel received in an invalid state.
- 117 — While connected to service circuit system (SCS) frame the SCS reported an exception.
- 118 — No disconnect flag received in play resource type in conversation package.
- 119 — Announcement type received in play collect resource type was invalid.
- 120 — Network management message received in an invalid package type.
- 121 — Request for caller interaction received in an invalid package type.
- 122 — While attempting to send a resource clear message to the database encountered a send message failure.
- 123 — Connection control message received out of sequence.
- 124 — Caller interaction message received out of sequence.
- 125 — Call failure while waiting for SCP response.
- 126 — Call failure while playing non-interruptible announcement.
- 127 — Call failure while playing final announcement.
- 128 — Call failure while playing interruptible announcement.

SEE PROPRIETARY NOTICE ON COVER PAGE

- 129 — Call failure while playing announcement. Invalid substate.
- 130 — Call failure while waiting for outcomplete event.
- 131 — Nature indicates an operator type. Invalid routing indicated.
- 132 — While trying to play and collect. No circuit condition detected.
- 133 — Received reject message indicating cause invoke. Missing mandatory parameter.
- 134 — Received reject message indicating cause return result. Missing mandatory_parameter.
- 135 — Received reject message indicating return error. Missing mandatory parameter.

4. ACTION TO BE TAKEN

If the test query is successful, no action is required if the expected operations were received as a result of the query to the database.

If the test query is not successful, the failure results indicate the trouble.

5. REFERENCES

PIDENT
AINTMESH
AINTTEST
IOCPIMC4
TMAD0005

Input Messages
TEST:TCAPAIN

SEE PROPRIETARY NOTICE ON COVER PAGE

ID VER:AIN-LIST
WORK CENTER.. MAC, MOC
GENERIC 4E18 Rel. 2 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

VER:AIN, OPT(LIST) :

TRIGGER NUMBER	DOM	AC	ABC	DEF	GHI	J	TOS
a,	b,	[c,]	d,	[e,]	[f,]	[g,]	h,
.
.
.

2. REASON FOR OUTPUT

To display the code group domain, area code indicator, and type of service index associated with the advanced intelligent network (AIN) trigger(s).

3. VARIABLE FIELD DEFINITIONS

- a AIN trigger number (1-8191).
- b Domain:
 - POTS — Plain old telephone service.
 - n — A decimal number (20 - 69).
- c Area code indicator:
 - N — Indicates the ABC digits are office codes, test codes or another non-area codes.
 - Y — Indicates the 3-digit codes (ABC) are area codes.
- d ABC digits (000-999).
- e DEF digits. The fourth, fifth, and sixth digits of a series (0-999).
- f GHI digits. The seventh, eighth, and ninth digits of a series (0-999).
- g J digit. The tenth digit of a series (0-9).
- h Type of service index (0-31).

4. ACTION TO BE TAKEN

None.

SEE PROPRIETARY NOTICE ON COVER PAGE

4ESS
OM-4A000-01

VER:AIN;OPT(LIST)

5. REFERENCES

PIDENTs
IOCPPVR4
VRFYCNTL
VRFYINPT
VRFYOUT
VRFYRTNG

Translation Guide, 4ESS™, TG-4, Division 8, Section 3AJ

Input Message
VER:AIN-LIST

SEE PROPRIETARY NOTICE ON COVER PAGE

ID VER:CODEGRP-3
WORK CENTER.. MAC, MOC
GENERIC 4E18 Rel. 2 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

```

VER:CODEGRP;OPT(DIG3),CUR:                DOM aaaa, NTD 3, AC b,

ST1 [cccc,] IDX1 [dddd,] ST2 [eeee,] IDX2 [ffff,]

ABC    CALLTYP      CALLDATA      AD1      AD2      SC      CHI      DESEP      DNST

ggg,   hhh, iiii, jjjj, kkkkkk, llll, mmmm,   nnn, oooooo,
      AD3 pppppppp, ADC      (qq,qq,qq,qq,qq,qq,qq,qq,qq,qq,qq,qq,qq,qq,qq,qq),
                               r
.
.
.
ggg,   hhh, iiii, jjjj, kkkkkk, llll, mmmm,   nnn, oooooo,
      AD3 pppppppp, ADC      (qq,qq,qq,qq,qq,qq,qq,qq,qq,qq,qq,qq,qq,qq,qq,qq),
                               r

```

2. REASON FOR OUTPUT

To list the type of routine treatment an ABC code grouping received in response to a verify input message.

3. VARIABLE FIELD DEFINITIONS

- a Domain identifies a community of interest for this three-digit translation.
- b Area code indicator:
 - N — Indicates the ABC digits are office codes, test codes or another non-area codes.
 - Y — Indicates the 3-digit codes (ABC) are area codes.
- c Subsequent digit index type. This is the value associated with the ST1 keyword in the input message. This field is blank if no subsequent digit type was requested with the input message.
- d Index value for the subsequent digit type in the ST1 field. The valid range is 0 to 1022 and it corresponds to the index associated with the IDX1 keyword in the input message. The field is blank if no subsequent digit type and index was requested.
- e Subsequent digit index type. This is the value associated with the ST2 keyword in the input message. This field is blank if no subsequent digit type was requested with the input message.

SEE PROPRIETARY NOTICE ON COVER PAGE

- f Index value for the subsequent digit type in the ST2 field. The valid range is 0 to 1022 and it corresponds to the index associated with the IDX2 keyword in the input message. The field is blank if no subsequent digit type and index was requested.
- g ABC digits. If area code is Y, a number between 200 and 999; if area code is N, a number between 000 and 999.
- h Call type. The major category for the disposition of the codes listed in the message.
- i Call data. For each CALLTYP, this field identifies the specific code group treatment.
- j Additional data field 1 (AD1).
- k Additional data field 2 (AD2).
- l Service categories field.
- m Call handling instruction field.
- n Destination separation. Identifies the destination for traffic flow purposes.
- o Dialed number service type.
- p Additional data field 3 (AD3), used to set feature bit indicator.
- q ADC - Acceptable digit counts for the code.
- r Phrases describing any special routing situations for the code:
AIN TRIGGER PRESENT - NUMBER ssss
INTERCHANGEABLE CODE
INTERCHANGEABLE CODE AND AIN TRIGGER PRESENT -
NUMBER ssss
INTERCHANGEABLE CODE AND NON-SHARED POSITIVE LOOK-
UP PRESENT
INTERCHANGEABLE CODE AND SHARED POSITIVE LOOK-
UP PRESENT
NON-SHARED POSITIVE LOOK-UP PRESENT
PERMISSIVE DIALING ALLOWED
PROTECTED TO NPA nxx
SHARED POSITIVE LOOK-UP PRESENT
- s Decimal number (1-8191).

4. ACTION TO BE TAKEN

None.

SEE PROPRIETARY NOTICE ON COVER PAGE

4ESS
OM-4A000-01

VER:CODEGRP;OPT(DIG3)

5. REFERENCES

PIDENTs
VRFYIRTG
VRFYOUT
VRFYRTNG

Translation Guide, 4ESS™, TG-4, Division 8, Section 3

Input Message
VER:CODEGRP

SEE PROPRIETARY NOTICE ON COVER PAGE

ID VER:CODEGRP-6
WORK CENTER.. MAC, MOC
GENERIC 4E18 Rel. 2 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

```
VER:CODEGRP;OPT(DIG6),CUR:                DOM aaaa, NTD b, AC c,  
  
ST1 [dddd,] IDX1 [eeee,] ST2 [ffff,] IDX2 [gggg,]  
  
ABC hhh,  
  
DEF    CALLTYP      CALldata    AD1      AD2      SC      CHI      DESEP      DNST  
                                ADC  
  
iii,   jjj, kkkkkkkkkkkkkkkkkkk, llll, mmmmmmm, nnnn, oooo, ppp, qqpppp,  
AD3 rrrrrrrr, ADC (ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss),  
t  
  
. . .  
iii,   jjj, kkkkkkkkkkkkkkkkkkk, llll, mmmmmmm, nnnn, oooo, ppp, qqpppp,  
AD3 rrrrrrrr, ADC (ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss),  
t
```

2. REASON FOR OUTPUT

To list the type of routing treatment for a four-, five-, or six-digit code grouping in response to an input verify message.

3. VARIABLE FIELD DEFINITIONS

- a Identifies a community of interest for this three-digit translation.
- b Number of translatable digits.
- c Area code indicator:
 - N — Indicates the ABC digits are office codes, test codes or another non-area codes.
 - Y — Indicates the 3-digit codes (ABC) are area codes.
- d Subsequent digit index type. This is the value associated with the ST1 keyword in the input message. This field is blank if no subsequent digit type was requested with the input message.
- e Index value for the subsequent digit type in the ST1 field. The valid range is 0 to 1022 and it corresponds to the index associated with the IDX1 keyword in the input message. The field is blank if no subsequent digit type and index was requested.

SEE PROPRIETARY NOTICE ON COVER PAGE

- f Subsequent digit index type. This is the value associated with the ST2 keyword in the input message. This field is blank if no subsequent digit type was requested with the input message.
- g Index value for the subsequent digit type in the ST2 field. The valid range is 0 to 1022 and it corresponds to the index associated with the IDX2 keyword in the input message. The field is blank if no subsequent digit type and index was requested.
- h ABC digits. If area code is Y, a number between 200 and 999; if area code is N, a number between 000 and 999.
- i DEF digits. The fourth, fifth, and sixth digits of a series. The number of digits in this field plus the ABC digits equals the number entered in the NTD field.
- j Call type. The major category for the disposition of the codes listed in the message.
- k Call data. For each CALLTYP, this field identifies the specific code group treatment.
- l Additional data field 1 (AD1).
- m Additional data field 2 (AD2).
- n Service categories field.
- o Call handling instruction field.
- p Destination separation. Identifies the destination for traffic flow purposes.
- q Dialed number service type.
- r Additional data field 3 (AD3), used to set feature bit indicator.
- s ADC - Acceptable digit counts for the code.
- t Phrases describing any special routing situations for the code:
AIN TRIGGER PRESENT - NUMBER uuuu
INTERCHANGEABLE CODE
INTERCHANGEABLE CODE AND AIN TRIGGER PRESENT -
NUMBER uuuu
INTERCHANGEABLE CODE AND NON-SHARED POSITIVE LOOK-
UP PRESENT
INTERCHANGEABLE CODE AND SHARED POSITIVE LOOK-
UP PRESENT
NON-SHARED POSITIVE LOOK-UP PRESENT
PERMISSIVE DIALING ALLOWED
PROTECTED TO NPA nxx

SEE PROPRIETARY NOTICE ON COVER PAGE

SHARED POSITIVE LOOK-UP PRESENT

u Decimal number (1-8191).

4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENTs
VRFYIRTG
VRFYOUT
VRFYRTNG

Translation Guide, 4ESSTM, TG-4, Division 8, Section 3

Input Message
VER:CODEGRP

SEE PROPRIETARY NOTICE ON COVER PAGE

ID VER:CODEGRP-9
WORK CENTER.. MAC, MOC
GENERIC 4E18 Rel. 2 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

```
VER:CODEGRP;OPT(DIG9),CUR:          DOM aaaa,  NTD b,  AC c,

ST1 [dddd,] IDX1 [eeee,] ST2 [ffff,] IDX2 [gggg,]

ABC hhh, DEF iii,

GHI   CALLTYP      CALLDATA      AD1      AD2      SC      CHI      DESEP      DNST

jjj,   kkk, 111111111111111111, mmmmm, nnnnnn, oooo, pppp,   qqg, rrrrrr,
      AD3 ssssssss, ADC   (tt,tt,tt,tt,tt,tt,tt,tt,tt,tt,tt,tt,tt,tt),
                        u

.
.
.
jjj,   kkk, 111111111111111111, mmmmm, nnnnnn, oooo, pppp,   qqg, rrrrrr,
      AD3 ssssssss, ADC   (tt,tt,tt,tt,tt,tt,tt,tt,tt,tt,tt,tt,tt,tt),
                        u
```

2. REASON FOR OUTPUT

To list the type of routing treatment for a seven-, eight-, or nine-digit code grouping in response to a verify input message.

3. VARIABLE FIELD DEFINITIONS

- a Identifies a community of interest for this 3-digit translation.
- b Number of translatable digits.
- c Area code indicator:
 - N — Indicates the ABC digits are office codes, test codes or another non-area codes.
 - Y — Indicates the 3-digit codes (ABC) are area codes.
- d Subsequent digit index type. This is the value associated with the ST1 keyword in the input message. This field is blank if no subsequent digit type was requested with the input message.
- e Index value for the subsequent digit type in the ST1 field. The valid range is 0 to 1022 and it corresponds to the index associated with the IDX1 keyword in the input message. The field is blank if no subsequent digit type and index was requested.

SEE PROPRIETARY NOTICE ON COVER PAGE

- f Subsequent digit index type. This is the value associated with the ST2 keyword in the input message. This field is blank if no subsequent digit type was requested with the input message.
- g Index value for the subsequent digit type in the ST2 field. The valid range is 0 to 1022 and it corresponds to the index associated with the IDX2 keyword in the input message. The field is blank if no subsequent digit type and index was requested.
- h ABC digits. If area code is Y, a number between 200 and 999; if area code is N, a number between 000 and 999.
- i DEF digits. The fourth, fifth, and sixth digits of a series.
- j GHI digits. The seventh, eighth, and ninth digits that complete the code group definition (0-999). The number of digits in the ABC, DEF, GHI fields must equal the number entered in the NTD field.
- k Call type. The major category for the disposition of the codes listed in the message.
- l Call data. For each CALLTYP this field identifies the specific code group treatment.
- m Additional data field 1 (AD1).
- n Additional data field 2 (AD2).
- o Service categories field.
- p Call handling instruction field.
- q Destination separation. Identifies the destination for traffic flow purposes.
- r Dialed number service type.
- s Additional data field 3 (AD3), used to set feature bit indicator.
- t ADC - Acceptable digit counts for the code.
- u Phrases describing any special routing situations for the code:
AIN TRIGGER PRESENT - NUMBER vvvv
INTERCHANGEABLE CODE
INTERCHANGEABLE CODE AND AIN TRIGGER PRESENT -
NUMBER vvvv
INTERCHANGEABLE CODE AND NON-SHARED POSITIVE LOOK-
UP PRESENT
INTERCHANGEABLE CODE AND SHARED POSITIVE LOOK-
UP PRESENT
NON-SHARED POSITIVE LOOK-UP PRESENT
PERMISSIVE DIALING ALLOWED

SEE PROPRIETARY NOTICE ON COVER PAGE

PROTECTED TO NPA nxx
SHARED POSITIVE LOOK-UP PRESENT
v Decimal number (1-8191).

4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENTs
VRFYIRTG
VRFYOUT
VRFYRTNG

Translation Guide, 4ESS™, TG-4, Division 8

Input Message
VER: CODEGRP

SEE PROPRIETARY NOTICE ON COVER PAGE

- f Subsequent digit index type. This is the value associated with the ST2 keyword in the input message. This field is blank if no subsequent digit type was requested with the input message.
- g Index value for the subsequent digit type in the ST2 field. The valid range is 0 to 1022 and it corresponds to the index associated with the IDX2 keyword in the input message. The field is blank if no subsequent digit type and index was requested.
- h ABC digits. If area code is Y, a number between 200 and 999; if area code is N, a number between 000 and 999.
- i DEF digits. The fourth, fifth, and sixth digits of a series.
- j GHI digits. The seventh, eighth, and ninth digits that complete the code group definition (0-999).
- k JKL digits. The tenth, eleventh, and twelfth digits of a series.
- l Call type. The major category for the disposition of the codes listed in the message.
- m Call data. For each CALLTYP this field identifies the specific code group treatment.
- n Additional data field 1 (AD1).
- o Additional data field 2 (AD2).
- p Service categories field.
- q Call handling instruction field.
- r Destination separation. Identifies the destination for traffic flow purposes.
- s Dialed number service type.
- t Additional data field 3 (AD3), used to set feature bit indicator.
- u ADC - Acceptable digit counts for the code.
- v Phrases describing any special routing situations for the code:
AIN TRIGGER PRESENT - NUMBER wwwwww
INTERCHANGEABLE CODE
INTERCHANGEABLE CODE AND AIN TRIGGER PRESENT -
NUMBER wwwwww
INTERCHANGEABLE CODE AND NON-SHARED POSITIVE LOOK-
UP PRESENT
INTERCHANGEABLE CODE AND SHARED POSITIVE LOOK-
UP PRESENT
NON-SHARED POSITIVE LOOK-UP PRESENT
PERMISSIVE DIALING ALLOWED

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PROTECTED TO NPA nxx

SHARED POSITIVE LOOK-UP PRESENT

w Decimal number (1-8191).

4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENTs
VRFYIRTG
VRFYOUT
VRFYRTNG

Translation Guide, 4ESS™, TG-4, Division 8, Section 3

Input Message
VER:CODEGRP

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	NBS	The internal building subdivision for the near end of the TSG.
b		Spare advanced intelligent network (AIN) triggers.
c		Used AIN triggers.
d		Spare auxiliary routing indexes.
e		Used auxiliary routing indexes.
f		Spare customer data block indexes.
g		Used customer data block indexes.
h		Spare customer routing block indexes.
i		Used customer routing block indexes.
j		Spare DIGSUPP indexes.
k		Used DIGSUPP indexes.
l		Spare FENN blocks.
m		Used FENN blocks.
n		Spare multiple carrier treatment indexes.
o		Assigned multiple carrier treatment indexes.
p		Spare multiple routing treatment indexes.
q		Assigned multiple routing treatment indexes.
r		Spare numbering data block indexes.
s		Used numbering data block indexes.
t		Spare proportional routing indexes.
u		Used proportional routing indexes.
v		Spare routing data block indexes.
w		Used routing data block indexes.
x		Spare trunk blocks.
y		Used trunk blocks.
z		Spare trunk-sub-group blocks.
A		Used trunk-sub-group blocks.
B		Spare terminating toll switch indexes.
C		Used terminating toll switch indexes.
D		Spare 1-digit blocks.
E		Used 1-digit blocks.
F		Spare positive call processing (PCP) indexes.

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G	Assigned PCP indexes.
H	Spare PCP ABCID indexes.
I	Assigned PCP ABCID indexes.
J	Spare automatic subsequent digit indexes.
K	Used automatic subsequent digit indexes.
L	Spare manual subsequent digit indexes.
M	Used manual subsequent digit indexes.
N	Spare call store translations blocks.
O	Used call store translations blocks.
P	Spare file store translations blocks.
Q	Used file store translations blocks.
R	Spare DLN translations blocks.
S	Used DLN translations blocks.
T	Spare trunk sub group head cell (TSGHC) trunk block status (TBS) words.
U	Used TSGHC TBS words.
V	Spare calling line identification presentation (CLIP) indexes.
W	Assigned CLIP indexes.
X	Spare DCLIP indexes.
Y	Assigned DCLIP indexes.
Z	Largest grouping entry in adjunct access table where customers all have the same line number.
a ¹	Largest grouping entry in adjunct destination table where the last four digits of the destination number are the same.
b ¹	Number of nailed up trunks (i.e., number of connections).
c ¹	Number of link access circuit identifiers (LACIDs) assigned.
d ¹	Home numbering plan areas (NPAs).
e ¹	Served NPAs.
f ¹	Space administration use number.
g ¹	Number of 1024-word blocks assigned.
h ¹	Assigned routing domains.

NOTE: For non AT&T office the spare used entries for CLIP and DCLIP will be '0' and the largest group entry contains '0'. list will be printed.

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4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENTs
IOCPPVR4
VRFYMISC
VRFYOUT

Translation Guide, 4ESS™, TG-4, Division 8

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ID TEST:TCAPAIN
WORK CENTER . . MAC, MOC, NMOC, TOC
GENERIC 4E19 Rel. 2 and later
APPLICATION . . 4E
TYPE Output

1. FORMAT

An Info_Analyzed test query:

[1] TEST:TCAPAIN;QRYTYPE a[:TSGN b,DATA c,TRNUM d,TOS e,DIG f]
[,ANI g][,SID h][,OLI i | ,IIDIGITS j][,RID k][,RDC l][,TIME m]...
... [LIST][,CD][,AUTHCODE n]

[OPERATION: o
PARAMETERS: p]
[v]

An Info_Collected test query:

[2] TEST:TCAPAIN;QRYTYPE a[:TSGN b,DATA c,TOS e,ANI g,DIG u]
[,SID h] [,OLI i | ,IIDIGITS j] [,RID k] [,RDC l][,TIME m]...
... [LIST][,CD][,AUTHCODE n]

[OPERATION: o
PARAMETERS: p]
[v]

2. REASON FOR OUTPUT

This output message is in response to the TEST:TCAPAIN input message, which requests either an Info_Analyzed or Info_Collected query.

The variable field o explains the results of the test query (whether successful or not). Variable p gives information to support the results.

3. VARIABLE FIELD DEFINITIONS

- a Type of query sent:
- 1 — Info_Collected query
 - 2 — Info_Analyzed query
- b The USERID contains the identity of the originating user which is the trunk subgroup number (TSGN).
- c The bearer capability of the call that encountered the trigger. The service switch point (SSP) shall include the bearer capability parameter in the message regardless of the originating access type as follows:
- 0 — Speech

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- 1 — f31kHz audio
- 2 — 7kHz audio, (NOT SUPPORTED)
- 3 — b56kbps, (NOT SUPPORTED)
- 4 — b64kbps, (NOT SUPPORTED)
- 5 — Packet mode data, (NOT SUPPORTED)

d

Trigger criteria type:

- 0 — Feature activator, (NOT SUPPORTED)
- 1 — Vertical service code, (NOT SUPPORTED)
- 2 — Customized access, (NOT SUPPORTED)
- 3 — Customized intercom, (NOT SUPPORTED)
- 4 — Numbering plan area (NPA)
- 5 — NPANXX
- 6 — Exchange number (NXX)
- 7 — NXXxxxx, where xxxx is the final four digits of the number.
- 8 — NPANXXxxxx, where xxxx is the final four digits of the number.
- 9 — Country code NPANXXxxxx, (NOT SUPPORTED), where xxxx is the final four digits of the number.
- 10 — Carrier access, (NOT SUPPORTED)
- 11 — Prefixes , (NOT SUPPORTED)
- 12 — n11, (NOT SUPPORTED), where n is a decimal number (2-9).
- 13 — aFR, (NOT SUPPORTED)
- 14 — Shared input/output (IO) trunk, (NOT SUPPORTED)
- 15 — Termination attempt, (NOT SUPPORTED)
- 16 — Off hook immediate (NOT SUPPORTED)
- 17 — Off hook delay, (NOT SUPPORTED)
- 18 — Channel setup primary rate interference (PRI), (NOT SUPPORTED)
- 19 — NPAN
- 20 — NPANX
- 21 — NPANXXx , where n is a decimal number (0-9).

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- 22 — NPANXXxx , where n is a decimal number (0-9).
- 23 — NPANXXxxx , where n is a decimal number (0-9).
- 24 — Network busy, (NOT SUPPORTED)

- e Type of service (TOS) indicator is used to obtain the transaction type to use in sending the query.
- f Called party identification (ID) represents the call's destination address. This parameter includes the nature of number along with the numbering plan, followed by the digits.

Nature of number (first two digits)

- 00 — Not applicable
- 01 — Subscriber number
- 02 — National (significant) number
- 03 — International number
- 04 — Subscriber number, operator requested (0+ call)
- 05 — National number, operator requested (0+ call)
- 06 — International number, operator requested (0+ call)
- 07 — No address present, operator requested (0-, 10XXX+0(0), or 00- call)
- 08 — No address present, cut-through call to carrier
- 09 — 950+ call from local exchange carrier public station or hotel/motel line or non-equal access end office (EAEO)
- 10 — Test line test code

Numbering plan (third digit)

- 0 — Unknown or not applicable
- 1 — Integrated services digital network (ISDN) numbering plan
- 2 — Private

For example:

EX: 0121234567
Nature of number: Subscriber number
Numbering plan: Private
Digits: 1234567

SEE PROPRIETARY NOTICE ON COVER PAGE

- g Charge number represents the billing number automatic number identification (ANI) of the call's originating party. Range: 3,6,10 digits.
- h Calling party ID represents the call's originating party. This parameter includes the nature of number, numbering plan, presentation restriction, screening indicator, followed by the digits.

Nature of number (first digit)

- 0 — Unknown or not applicable
- 1 — Unique subscriber number
- 2 — Unique national (significant) number
- 3 — Unique international number
- 4 — Non-unique subscriber number
- 5 — Non-unique national number
- 6 — Non-unique international number
- 7 — Test line test code

Numbering plan (second digit)

- 0 — Unknown or not applicable
- 1 — ISDN numbering plan
- 2 — Private

Presentation restriction indicator (PRI) - screening indicator (SI) (third digit)

- 0 — Presentation allowed - reserved for user provided, not screened or spare
- 1 — Presentation allowed - user provided, passed network screening
- 2 — Presentation allowed - network provided
- 3 — Presentation restricted - reserved for user provided, not screened or spare
- 4 — Presentation restricted - user provided, passed network screening
- 5 — Presentation restricted - network provided
- 6 — Number unavailable - reserved for user provided, not screened or spare

SEE PROPRIETARY NOTICE ON COVER PAGE

- 7 — Number unavailable - user provided, passed network screening
- 8 — Number unavailable - network provided

For example:

EX: 1081234567
Nature of number: Unique subscriber number
Numbering plan: Unknown or not applicable
PRI-SI: Number unavailable -
network provided
Digits: 1234567

- i Charge party station type represents the originating line information (OLI) of the call's originating party. Range: 0...99.
- j Charge party station type represents the information digits (II) of the call's originating party. Range: 0...99.
- k Redirecting party ID represents the dialed number of the last station for which call forwarding was invoked. It is only meaningful if the call has encountered call forwarding (either switched-based, or signaling control point (SCP) initiated via forward_call) before encountering a trigger. This parameter includes the nature of number, numbering plan, presentation restriction, screening indicator, followed by the digits.

Nature of number (first digit)

- 0 — Unknown or not applicable
- 1 — Unique subscriber number
- 2 — Unique national (significant) number
- 3 — Unique international number
- 4 — Non-unique subscriber number
- 5 — Non-unique national number
- 6 — Non-unique international number
- 7 — Test line test code

Numbering plan (second digit)

- 0 — Unknown or not applicable
- 1 — ISDN numbering plan
- 2 — Private

SEE PROPRIETARY NOTICE ON COVER PAGE

Presentation restriction indicator (PRI) - screening indicator (SI) (third digit)

- 0 — Presentation allowed - reserved for user provided, not screened or spare
- 3 — Presentation restricted - reserved for user provided, not screened or spare
- 6 — Number unavailable - reserved for user provided, not screened or spare

For example:

EX: 1067081234567
Nature of number: Unique subscriber number
Numbering plan: Unknown or not applicable
PRI-SI: Number unavailable - reserved for user provided, not screened or spare
Digits: 7081234567

1

Redirection information reflects the information about the call forwarding which has occurred on the call. It is only meaningful if the call has encountered call forwarding (either switch-based, or SCP initiated via forward_call) before encountering a trigger. The redirection information parameter contains the following fields:

- Original Redirection Reason — Field reflects the reason the first call forwarding action was taken.
- Redirection Reason — Field reflects the reason the most recent call forwarding action was taken.
- Redirection Counter — Keeps count of the number of call forwarding actions which have occurred on the call. It is incremented each time SCP initiated forwarding occurs.

Original redirection reason (first digit)

- 0 — Unknown/ not available
- 1 — User busy
- 2 — No reply
- 3 — Unconditional

Redirection reason (second digit)

- 0 — Unknown/ not available
- 1 — User busy

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- 2 — No reply
- 3 — Unconditional

Redirection counter (third and fourth digit). Range: 01-10

- m Sets the T1 timer for waiting reply. If not specified the default will be the value normally used for call processing messages.
- CD** Continue data is used when there is too much data for one line a second test query had to be entered with the remaining data.
- LIST** Used to dump the message received from the SCP database.
- n Original called party ID represents the call's destination address. This parameter remains unchanged, representing the actual original called party number, after it is set by the first forwarding action encountered by the call. It continues to reflect the original destination address of the call, and can not be overwritten. This parameter includes the nature of number, numbering plan, presentation restrictions, and screening indicator, followed by the digits. Range: 3,6,10-15 digits.

Nature of number (first digit)

- 0 — Unknown or not applicable
- 1 — Unique subscriber number
- 2 — Unique national (significant) number
- 3 — Unique international number
- 4 — Non-unique subscriber number
- 5 — Non-unique national number
- 6 — Non-unique international number
- 7 — Test line test code

Numbering plan (second digit)

- 0 — Unknown or not applicable
- 1 — ISDN numbering plan
- 2 — Private

SEE PROPRIETARY NOTICE ON COVER PAGE

Presentation restriction indicator (PRI) - screening indicator (SI) (third digit)

- 0 — Presentation allowed - reserved for user provided, not screened or spare
- 1 — Presentation allowed - user provided, passed network screening
- 2 — Presentation allowed - network provided
- 3 — Presentation restricted - reserved for user provided, not screened or spare
- 4 — Presentation restricted - user provided, passed network screening
- 5 — Presentation restricted - network provided
- 6 — Number unavailable - reserved for user provided, not screened or spare
- 7 — Number unavailable - user provided, passed network screening
- 8 — Number unavailable - network provided

For example:

EX: 1081234567
Nature of number: Unique subscriber number
Numbering plan: Unknown or not applicable
PRI-SI: Number unavailable -
network provided
Digits: 1234567

- o The output from this test query indicates whether the query was successful or not:

ANALYZE ROUTE
CONTINUE
DISCONNECT
SEND TO RESOURCE

- p The following text phrases may appear when the query succeeds:

If variable o is ANALYZE ROUTE then:

CHARGE NUMBER qqq qqq qqqq NAT: 0xrr PLAN: 0xs
CALLING PARTY ID qqq qqq qqqq NAT: 0xrr PLAN:0xs
CHARGE PARTY STATION TYPE rr

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CALLED PARTY ID qqq qqq qqqq NAT: 0xrr PLAN: 0xs
PRIMARY CARRIER qqqq
ALTERNATE CARRIER qqqq
SECOND ALTERNATE CARRIER qqqq
REDIRECTING PARTY ID qqq qqq qqqq NAT: 0xrr PLAN:0xs
PRIMARY BILLING INDICATOR CALL TYPE: qqq SFI: qqq
ALTERNATE BILLING INDICATOR CALL TYPE: qqq SFI: qqq
SECOND ALTERNATE BILLING INDICATOR CALL TYPE: qqq ...
...SFI: qqq
OVERFLOW BILLING INDICATOR CALL TYPE: qqq SFI: qqq
AMA ALTERNATE BILLING NUMBER qqq qqq qqqq NAT: 0xrr ...
...PLAN: 0xs
AMA BUSINESS CUSTOMER ID qqq qqq qqqq NAT: 0xrr ...
...PLAN: 0xs
AMA LINE NUMBER: qqq qqq qqqq NAT: 0xrr PLAN: 0xs
AMA SLP ID qqqqqqqqq
AMA DIGITS DIALED WC qqq qqq qqqq NAT: 0xrr PLAN: 0xs

If variable o is CONTINUE then:

PRIMARY BILLING INDICATOR CALL TYPE: qqq SFI: qqq
AMA ALTERNATE BILLING NUMBER qqq qqq qqqq NAT: 0xrr ...
...PLAN: 0xs
AMA BUSINESS CUSTOMER ID qqq qqq qqqq NAT: 0xrr ...
...PLAN: 0xs
AMA LINE NUMBER: qqq qqq qqqq NAT: 0xrr PLAN: 0xs
AMA SLP ID qqqqqqqqq
AMA DIGITS DIALED WC qqq qqq qqqq NAT: 0xrr PLAN: 0xs

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If variable o is DISCONNECT then:

PRIMARY BILLING INDICATOR CALL TYPE: qqq SFI: qqq
AMA ALTERNATE BILLING NUMBER qqq qqq qqqq NAT: 0xrr ...
...PLAN: 0xs
AMA BUSINESS CUSTOMER ID qqq qqq qqqq NAT: 0xrr ...
...PLAN: 0xs
AMA LINE NUMBER: qqq qqq qqqq NAT: 0xrr PLAN: 0xs
AMA SLP ID qqqqqqqqq
AMA DIGITS DIALED WC qqq qqq qqqq NAT: 0xrr PLAN: 0xs

If variable o is SEND TO RESOURCE then:

RESOURCE TYPE q
STR PARAMETER BLOCK:
ANNOUNCEMENT: 37
MAX DIGITS: t
DISCONNECT FLAG # PRESENT = DISCONNECT LEG
ABSENT = DO NOT DISCONNECT LEG
ANSWER INDICATOR # PRESENT = RETURN ANSWER ...
...SUPERVISION
ABSENT = DO NOT RETURN ANSWER ...
...SUPERVISION
PRIMARY BILLING INDICATOR CALL TYPE: qqq SFI: qqq
AMA ALTERNATE BILLING NUMBER qqq qqq qqqq NAT: 0xrr ...
...PLAN: 0xs
AMA BUSINESS CUSTOMER ID qqq qqq qqqq NAT: 0xrr ...
...PLAN: 0xs
AMA LINE NUMBER: qqq qqq qqqq NAT: 0xrr PLAN: 0xs
AMA SLP ID qqqqqqqqq
AMA DIGITS DIALED WC qqq qqq qqqq NAT: 0xrr PLAN: 0xs

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- q Decimal number (0-9).
- r Nature of number:
 For called parameters in hexadecimal:
- 00 — Not applicable
 - 01 — Subscriber number
 - 03 — National (significant) number
 - 04 — International number
 - 71 — Subscriber number, operator requested (0+ call)
 - 72 — National number, operator requested (0+ call)
 - 73 — International number, operator requested (0+ call)
 - 74 — No address present, operator requested (0-,10xxx+0(0), or 00-call), where x is a decimal number (0-9)
 - 75 — No address present, cut-through call to carrier
 - 76 — 950+ call from local exchange carrier public station or hotel/motel line or non-EAEO
 - 77 — Test line test code

For calling parameter in hexadecimal:

- 00 — Unknown or not applicable, default
- 01 — Unique subscriber number
- 03 — Unique national (significant) number
- 04 — Unique international number
- 71 — Non-unique subscriber number
- 73 — Non-unique national number
- 74 — Non-unique international number
- 77 — Test line test code

For charge number parameters in hexadecimal:

- 01 — Ani of the calling party; subscriber number
- 02 — Ani not available or not provided
- 03 — Ani of the calling party; national number
- 05 — Ani of the called party included; subscriber number
- 06 — Ani of the called party not included
- 07 — Ani of the called party included; national number

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- s Numbering plan for calling, called, and charge number parameters:
- 0 — Unknown or not applicable
 - 1 — ISDN numbering plan
 - 5 — Private
- t Collection type indication (MAX DIGITS):
- 0 — Not present
 - 1-32 — Fixed number of digits
 - 253 — Normal number of digits
 - 254 — Any number of digits
- u Collected address information contains the "untranslated" address information collected from the originating trunk. This parameter includes the nature of number along with the numbering plan, followed by the digits.
- Nature of number (first two digits)
- 00 — Not applicable
 - 01 — Subscriber number
 - 02 — National (significant) number
 - 03 — International number
 - 04 — Subscriber number, operator requested (0+ call)
 - 05 — National number, operator requested (0+ call)
 - 06 — International number, operator requested (0+ call)
 - 07 — No address present, operator requested (0-, 10XXX+0(0), or 00- call)
 - 08 — No address present, cut-through call to carrier
 - 09 — 950+ call from local exchange carrier public station or hotel/motel line or non-EAEO
 - 10 — Test line test code
- Numbering plan (third digit)
- 0 — Unknown or not applicable
 - 1 — ISDN numbering plan
 - 2 — Private

SEE PROPRIETARY NOTICE ON COVER PAGE

For example:

EX: 0127081234567
Nature of number: Subscriber number
Numbering plan: Private
Digits: 7081234567

NOTE: The following is a list of parameters:

CALLING PARAMETERS — Calling parameters include: automatic message accounting (AMA) business customer ID, AMA business customer ID, AMA line number, calling party ID, original called party ID, and redirecting party ID.

CALLED PARAMETERS — Called parameters include: access code, AMA digits dialed WC, called party ID, collected address info, collected digits, lata, outpulse number, traveling class mark (TCM), and vertical service code.

CHARGE NUMBER PARAMETERS — Charge number parameters include the AMA alternate billing number and charge number.

v

Exception code:

- 1 — Unrecognized package type in received transaction capability application part (TCAP) message.
- 2 — Transaction ID not present in package for which a transaction ID (TID) was expected.
- 3 — Incorrect transaction portion.
- 4 — Badly structured component portion.
- 5 — Unrecognized component type.
- 6 — Unrecognize operation code error.
- 7 — Incorrect component portion error.
- 8 — Badly structured component portion.
- 9 — Missing mandatory parameter detected.
- 10 — Advanced intelligent network (AIN) TCAP message returned by common network interface (CNI).
- 11 — AIN TCAP message returned by direct link node (DLN).
- 12 — Unitdata service message received.
- 13 — Received protocol abort (PABORT) message with cause indicating unrecognized package type.

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- 14 — Received PABORT message with cause indicating incorrect transaction portion.
- 15 — Received PABORT message indicating unrecognized transaction ID.
- 16 — Received PABORT indicating permanent timeout release.
- 17 — Received PABORT indicating resources unavailable.
- 18 — Received reject message indicating cause general. Unrecognized component.
- 19 — Received reject message indicating cause general. Incorrect component portion.
- 20 — Received reject message indicating cause general. Badly structured component portion.
- 21 — Received reject message indicating cause invoke. Duplicate invoke ID.
- 22 — Received reject message indicating cause invoke. Unrecognized operation code.
- 23 — Received reject message indicating cause invoke. Incorrect parameter.
- 24 — Received reject message indicating cause invoke. Unrecognized correlation ID.
- 25 — Received reject message indicating cause return result. Unrecognized correlation ID.
- 26 — Received reject message indicating cause return result. Unexpected return result.
- 27 — Received reject message indicating cause return result. Incorrect parameter.
- 28 — Received reject message indicating return error. Unrecognized correlation ID.
- 29 — Received reject message indicating return error. Unexpected return error.
- 30 — Received reject message indicating return error. Unrecognized error code.
- 31 — Received reject message indicating return error. Unexpected error.
- 32 — Received reject message indicating return error. Incorrect parameter.
- 33 — Received return result message.
- 34 — Unexpected caller interaction message sequence error.

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- 35 — Unexpected connection control message sequence error.
- 36 — Invalid opcode family detected.
- 37 — Invalid opcode specifier for caller interaction family.
- 38 — Invalid opcode specifier for connection control family.
- 39 — Invalid opcode specifier for information request family.
- 40 — Invalid opcode specifier for network management family.
- 41 — Invalid opcode specifier for send notification family.
- 42 — Invalid opcode specifier for abnormal family.
- 43 — Invalid request for connection control operation after call finaled.
- 44 — Connection control operation received in an invalid package type.
- 45 — Connection control. Continue operation received for call which has not received AIN count.
- 46 — Invalid redirection digits received in connection control operation.
- 47 — Exceeded redirection count of valid redirections.
- 48 — Invalid charge number parameter received in connection control operation.
- 49 — Invalid calling party number (CPN) digits parameter received in connection control operation.
- 50 — Invalid called digits parameter received in connection control operation.
- 51 — Invalid carrier digits parameter received in connection control operation.
- 52 — Invalid cut-through to carrier request in connection control operation.
- 53 — Connection control operation subroutine called but no connection control command found.
- 54 — Invalid request for termination notification data after call has been finaled.
- 55 — Invalid request for termination notification information.
- 56 — Invalid request for caller interaction operation after call has been finaled.
- 57 — Invalid resource type received in response package.

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- 58 — Disconnect flag not received in caller interaction in response package.
- 59 — Announcement type received in response package was invalid.
- 60 — Announcement received in response package not provisioned.
- 61 — No circuit condition detected when circuit hunt attempted for caller interaction (CI) in response package.
- 62 — Invalid resource type received in conversation package.
- 63 — Invalid disconnect flag detected for play collect in conversation package.
- 64 — Invalid send to resource type detected in conversation package.
- 65 — Invalid value of MAX DIGITS in caller interaction operation.
- 66 — No announcement received in conversation package for caller interaction command.
- 67 — Announcement received not provisioned.
- 68 — Disconnect flag received in play resource type in conversation package.
- 69 — No circuit condition detected when circuit hunt attempted for CI in conversation package.
- 70 — Monitor for change operation received in invalid package type.
- 71 — Update request received in invalid package type.
- 72 — Caller abandon condition occurred.
- 73 — Timeout while waiting for response from AIN SCP.
- 74 — Invalid transaction ID detected.
- 75 — Invalid AIN state condition detected.
- 76 — Mandatory parameter not received.
- 77 — Parameter received out of sequence.
- 78 — Invalid action detected in parse table.
- 79 — Default error in operation of abnormal. Report error.
- 80 — Error of erroneous data in operation of abnormal. Report error.

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- 81 — Error of missing conditional parameter in operation of abnormal. Report error.
- 82 — Error of response message timer expired in operation of abnormal. Report error.
- 83 — Error of unexpected communication in operation of abnormal. Report error.
- 84 — Error of unexpected message in operation of abnormal. Report error.
- 85 — Error of unexpected message sequence in operation of abnormal. Report error.
- 86 — Error of unexpected parameter sequence in operation of abnormal. Report error.
- 87 — Unrecognized problem type detected in reject component.
- 88 — Unrecognized problem code in type general.
- 89 — Unrecognized problem code in type invoke.
- 90 — Unrecognized problem code in type return result.
- 91 — Unrecognized problem code in type transaction portion.
- 92 — Problem code in reject indicates unrecognized package type.
- 93 — Problem code in reject indicates incorrect transaction portion.
- 94 — Problem code in reject indicates badly structured transaction portion.
- 95 — Problem code in reject indicates unrecognized transaction ID.
- 96 — Unexpected message application error detected.
- 97 — Default error in return error.
- 98 — Error of erroneous data in return error.
- 99 — Error of missing conditional parameter in return error.
- 100 — Error of response message timer expired in return error.
- 101 — Error of unexpected communication in return error.
- 102 — Error of unexpected message in return error.
- 103 — Error of unexpected message sequence in return error.

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- 104 — Error of unexpected parameter sequence in return error.
- 105 — Return result component received.
- 106 — Too many digits received in digits parameter.
- 107 — Invalid number of digits detected in charge number.
- 108 — Invalid number of digits detected in calling party ID parameter.
- 109 — Invalid nature detected in called number parameter.
- 110 — Invalid digit count detected in received national number.
- 111 — Invalid called digit count.
- 112 — Invalid AMA digits detected.
- 113 — Request for cancel after call has been final handled.
- 114 — Request for cancel operation received in invalid package type.
- 115 — Request to cancel received while playing final announcement.
- 116 — Request to cancel received in an invalid state.
- 117 — While connected to service circuit system (SCS) frame the SCS reported an exception.
- 118 — No disconnect flag received in play resource type in conversation package.
- 119 — Announcement type received in play collect resource type was invalid.
- 120 — Network management message received in an invalid package type.
- 121 — Request for caller interaction received in an invalid package type.
- 122 — While attempting to send a resource clear message to the database encountered a send message failure.
- 123 — Connection control message received out of sequence.
- 124 — Caller interaction message received out of sequence.
- 125 — Call failure while waiting for SCP response.
- 126 — Call failure while playing non-interruptible announcement.
- 127 — Call failure while playing final announcement.
- 128 — Call failure while playing interruptible announcement.

SEE PROPRIETARY NOTICE ON COVER PAGE

- 129 — Call failure while playing announcement. Invalid substate.
- 130 — Call failure while waiting for outcomplete event.
- 131 — Nature indicates an operator type. Invalid routing indicated.
- 132 — While trying to play and collect. No circuit condition detected.
- 133 — Received reject message indicating cause invoke. Missing mandatory parameter.
- 134 — Received reject message indicating cause return result. Missing mandatory_parameter.
- 135 — Received reject message indicating return error. Missing mandatory parameter.

4. ACTION TO BE TAKEN

If the test query is successful, no action is required if the expected operations were received as a result of the query to the database.

If the test query is not successful, the failure results indicate the trouble.

5. REFERENCES

PIDENT
AINTMESH
AINTTEST
IOCPIMC4
TMAD0005

Input Messages
TEST:TCAPAIN

SEE PROPRIETARY NOTICE ON COVER PAGE

ID VER:AIN-LIST
WORK CENTER.. MAC, MOC
GENERIC 4E19 Rel. 2 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

VER:AIN,OPT(LIST) :

TRIGGER NUMBER	DOM	AC	ABC	DEF	GHI	J	TOS
a,	b,	[c,]	d,	[e,]	[f,]	[g,]	h,
.
.
.

2. REASON FOR OUTPUT

To display the code group domain, area code indicator, and type of service index associated with the advanced intelligent network (AIN) trigger(s).

3. VARIABLE FIELD DEFINITIONS

- a AIN trigger number (1-8191).
- b Domain:
POTS — Plain old telephone service.
n — A decimal number (20 - 69).
- c Area code indicator:
N — Indicates the ABC digits are office codes, test codes or another non-area codes.
Y — Indicates the 3-digit codes (ABC) are area codes.
- d ABC digits (000-999).
- e DEF digits. The fourth, fifth, and sixth digits of a series (0-999).
- f GHI digits. The seventh, eighth, and ninth digits of a series (0-999).
- g J digit. The tenth digit of a series (0-9).
- h Type of service index (0-31).

4. ACTION TO BE TAKEN

None.

SEE PROPRIETARY NOTICE ON COVER PAGE

4ESS
OM-4B000-01

VER:AIN;OPT(LIST)

5. REFERENCES

PIDENTs
IOCPPVR4
VRFYCNTL
VRFYINPT
VRFYOUT
VRFYRTNG

Translation Guide, 4ESSTM, TG-4, Division 8, Section 3AJ

Input Message
VER:AIN-LIST

SEE PROPRIETARY NOTICE ON COVER PAGE

- f Index value for the subsequent digit type in the ST2 field. The valid range is 0 to 1022 and it corresponds to the index associated with the IDX2 keyword in the input message. The field is blank if no subsequent digit type and index was requested.
- g ABC digits. If area code is Y, a number between 200 and 999; if area code is N, a number between 000 and 999.
- h Call type. The major category for the disposition of the codes listed in the message.
- i Call data. For each CALLTYP, this field identifies the specific code group treatment.
- j Additional data field 1 (AD1).
- k Additional data field 2 (AD2).
- l Service categories field.
- m Call handling instruction field.
- n Destination separation. Identifies the destination for traffic flow purposes.
- o Dialed number service type.
- p Additional data field 3 (AD3), used to set feature bit indicator.
- q ADC - Acceptable digit counts for the code.
- r Phrases describing any special routing situations for the code:
AIN TRIGGER PRESENT - NUMBER ssss
INTERCHANGEABLE CODE
INTERCHANGEABLE CODE AND AIN TRIGGER PRESENT -
NUMBER ssss
INTERCHANGEABLE CODE AND NON-SHARED POSITIVE LOOK-
UP PRESENT
INTERCHANGEABLE CODE AND SHARED POSITIVE LOOK-
UP PRESENT
NON-SHARED POSITIVE LOOK-UP PRESENT
PERMISSIVE DIALING ALLOWED
PROTECTED TO NPA nxx
SHARED POSITIVE LOOK-UP PRESENT
- s Decimal number (1-8191).

4. ACTION TO BE TAKEN

None.

SEE PROPRIETARY NOTICE ON COVER PAGE

4ESS
OM-4B000-01

VER:CODEGRP;OPT(DIG3)

5. REFERENCES

PIDENTs
VRFYIRTG
VRFYOUT
VRFYRTNG

Translation Guide, 4ESSTM, TG-4, Division 8, Section 3

Input Message
VER:CODEGRP

SEE PROPRIETARY NOTICE ON COVER PAGE

ID VER:CODEGRP-6
WORK CENTER.. MAC, MOC
GENERIC 4E19 Rel. 2 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

```
VER:CODEGRP;OPT(DIG6),CUR:          DOM aaaa, NTD b, AC c,  
  
ST1 [dddd,] IDX1 [eeee,] ST2 [ffff,] IDX2 [gggg,]  
  
ABC hhh,  
  
DEF    CALLTYP      CALLDATA      AD1      AD2      SC      CHI      DESEP      DNST  
                                ADC  
  
iii,   jjj, kkkkkkkkkkkkkkkkkkk, llll, mmmmmmm, nnnn, oooo,   ppp, qppppq,  
      AD3 rrrrrrrr, ADC    (ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss),  
                                t  
  
.  
.  
.  
  
iii,   jjj, kkkkkkkkkkkkkkkkkkk, llll, mmmmmmm, nnnn, oooo,   ppp, qppppq,  
      AD3 rrrrrrrr, ADC    (ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss,ss),  
                                t
```

2. REASON FOR OUTPUT

To list the type of routing treatment for a four-, five-, or six-digit code grouping in response to an input verify message.

3. VARIABLE FIELD DEFINITIONS

- a Identifies a community of interest for this three-digit translation.
- b Number of translatable digits.
- c Area code indicator:
 - N — Indicates the ABC digits are office codes, test codes or another non-area codes.
 - Y — Indicates the 3-digit codes (ABC) are area codes.
- d Subsequent digit index type. This is the value associated with the ST1 keyword in the input message. This field is blank if no subsequent digit type was requested with the input message.
- e Index value for the subsequent digit type in the ST1 field. The valid range is 0 to 1022 and it corresponds to the index associated with the IDX1 keyword in the input message. The field is blank if no subsequent digit type and index was requested.

SEE PROPRIETARY NOTICE ON COVER PAGE

- f Subsequent digit index type. This is the value associated with the ST2 keyword in the input message. This field is blank if no subsequent digit type was requested with the input message.
- g Index value for the subsequent digit type in the ST2 field. The valid range is 0 to 1022 and it corresponds to the index associated with the IDX2 keyword in the input message. The field is blank if no subsequent digit type and index was requested.
- h ABC digits. If area code is Y, a number between 200 and 999; if area code is N, a number between 000 and 999.
- i DEF digits. The fourth, fifth, and sixth digits of a series. The number of digits in this field plus the ABC digits equals the number entered in the NTD field.
- j Call type. The major category for the disposition of the codes listed in the message.
- k Call data. For each CALLTYP, this field identifies the specific code group treatment.
- l Additional data field 1 (AD1).
- m Additional data field 2 (AD2).
- n Service categories field.
- o Call handling instruction field.
- p Destination separation. Identifies the destination for traffic flow purposes.
- q Dialed number service type.
- r Additional data field 3 (AD3), used to set feature bit indicator.
- s ADC - Acceptable digit counts for the code.
- t Phrases describing any special routing situations for the code:
AIN TRIGGER PRESENT - NUMBER uuuu
INTERCHANGEABLE CODE
INTERCHANGEABLE CODE AND AIN TRIGGER PRESENT -
NUMBER uuuu
INTERCHANGEABLE CODE AND NON-SHARED POSITIVE LOOK-
UP PRESENT
INTERCHANGEABLE CODE AND SHARED POSITIVE LOOK-
UP PRESENT
NON-SHARED POSITIVE LOOK-UP PRESENT
PERMISSIVE DIALING ALLOWED
PROTECTED TO NPA nxx

SEE PROPRIETARY NOTICE ON COVER PAGE

SHARED POSITIVE LOOK-UP PRESENT

u Decimal number (1-8191).

4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENTs
VRFYIRTG
VRFYOUT
VRFYRTNG

Translation Guide, 4ESS™, TG-4, Division 8, Section 3

Input Message
VER:CODEGRP

SEE PROPRIETARY NOTICE ON COVER PAGE

ID VER:CODEGRP-9
WORK CENTER.. MAC, MOC
GENERIC 4E19 Rel. 2 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

```
VER:CODEGRP;OPT(DIG9),CUR:          DOM aaaa,  NTD b,  AC c,  
  
ST1 [dddd,] IDX1 [eeee,] ST2 [ffff,] IDX2 [gggg,]  
  
ABC hhh, DEF iii,  
  
GHI   CALLTYP      CALLDATA      AD1      AD2      SC      CHI      DESEP      DNST  
  
jjj,   kkk, 111111111111111111, mmmmm, nnnnnn, oooo, pppp,   qq, rrrrrr,  
      AD3 ssssssss, ADC   (tt,tt,tt,tt,tt,tt,tt,tt,tt,tt,tt,tt,tt),  
                        u  
  
. . .  
jjj,   kkk, 111111111111111111, mmmmm, nnnnnn, oooo, pppp,   qq, rrrrrr,  
      AD3 ssssssss, ADC   (tt,tt,tt,tt,tt,tt,tt,tt,tt,tt,tt,tt,tt),  
                        u
```

2. REASON FOR OUTPUT

To list the type of routing treatment for a seven-, eight-, or nine-digit code grouping in response to a verify input message.

3. VARIABLE FIELD DEFINITIONS

- a Identifies a community of interest for this 3-digit translation.
- b Number of translatable digits.
- c Area code indicator:
 - N — Indicates the ABC digits are office codes, test codes or another non-area codes.
 - Y — Indicates the 3-digit codes (ABC) are area codes.
- d Subsequent digit index type. This is the value associated with the ST1 keyword in the input message. This field is blank if no subsequent digit type was requested with the input message.
- e Index value for the subsequent digit type in the ST1 field. The valid range is 0 to 1022 and it corresponds to the index associated with the IDX1 keyword in the input message. The field is blank if no subsequent digit type and index was requested.

SEE PROPRIETARY NOTICE ON COVER PAGE

- f Subsequent digit index type. This is the value associated with the ST2 keyword in the input message. This field is blank if no subsequent digit type was requested with the input message.
- g Index value for the subsequent digit type in the ST2 field. The valid range is 0 to 1022 and it corresponds to the index associated with the IDX2 keyword in the input message. The field is blank if no subsequent digit type and index was requested.
- h ABC digits. If area code is Y, a number between 200 and 999; if area code is N, a number between 000 and 999.
- i DEF digits. The fourth, fifth, and sixth digits of a series.
- j GHI digits. The seventh, eighth, and ninth digits that complete the code group definition (0-999). The number of digits in the ABC, DEF, GHI fields must equal the number entered in the NTD field.
- k Call type. The major category for the disposition of the codes listed in the message.
- l Call data. For each CALLTYP this field identifies the specific code group treatment.
- m Additional data field 1 (AD1).
- n Additional data field 2 (AD2).
- o Service categories field.
- p Call handling instruction field.
- q Destination separation. Identifies the destination for traffic flow purposes.
- r Dialed number service type.
- s Additional data field 3 (AD3), used to set feature bit indicator.
- t ADC - Acceptable digit counts for the code.
- u Phrases describing any special routing situations for the code:
AIN TRIGGER PRESENT - NUMBER vvvv
INTERCHANGEABLE CODE
INTERCHANGEABLE CODE AND AIN TRIGGER PRESENT -
NUMBER vvvv
INTERCHANGEABLE CODE AND NON-SHARED POSITIVE LOOK-
UP PRESENT
INTERCHANGEABLE CODE AND SHARED POSITIVE LOOK-
UP PRESENT
NON-SHARED POSITIVE LOOK-UP PRESENT
PERMISSIVE DIALING ALLOWED

SEE PROPRIETARY NOTICE ON COVER PAGE

4ESS
OM-4B000-01

VER:CODEGRP;OPT(DIG9)

PROTECTED TO NPA nxx
SHARED POSITIVE LOOK-UP PRESENT
v Decimal number (1-8191).

4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENTs
VRFYIRTG
VRFYOUT
VRFYRTNG

Translation Guide, 4ESS™, TG-4, Division 8

Input Message
VER:CODEGRP

SEE PROPRIETARY NOTICE ON COVER PAGE

ID VER:CODEGRP-12
WORK CENTER.. MAC, MOC
GENERIC 4E19 Rel. 2 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

```
VER:CODEGRP;OPT(DIG12),CUR:          DOM aaaa, NTD bb, AC c,  
  
ST1 [dddd,] IDX1 [eeee,] ST2 [ffff,] IDX2 [gggg,]  
  
ABC hhh, DEF iii, GHI jjj,  
  
JKL   CALLTYP      CALLDATA      AD1      AD2   SC   CHI   DESEP   DNST  
  
kkk,   lll, mmmmmmmmmmmmmmmmmmmmm, nnnn, oooooo, pppp, qqqq,   rrr, ssssss,  
      AD3 tttttttt, ADC   (uu,uu,uu,uu,uu,uu,uu,uu,uu,uu,uu,uu,uu,uu,uu,uu),  
                          v  
  
. . . . .  
kkk,   lll, mmmmmmmmmmmmmmmmmmmmm, nnnn, oooooo, pppp, qqqq,   rrr, ssssss,  
      AD3 tttttttt, ADC   (uu,uu,uu,uu,uu,uu,uu,uu,uu,uu,uu,uu,uu,uu,uu,uu),  
                          v
```

2. REASON FOR OUTPUT

To list the type of routing treatment for a ten-, eleven-, or twelve-digit code grouping in response to a verify input message.

3. VARIABLE FIELD DEFINITIONS

- a Identifies a community of interest for this three-digit translation.
- b Number of translatable digits.
- c Area code indicator:
 - N — Indicates the ABC digits are office codes, test codes or another non-area codes.
 - Y — Indicates the 3-digit codes (ABC) are area codes.
- d Subsequent digit index type. This is the value associated with the ST1 keyword in the input message. This field is blank if no subsequent digit type was requested with the input message.
- e Index value for the subsequent digit type in the ST1 field. The valid range is 0 to 1022 and it corresponds to the index associated with the IDX1 keyword in the input message. The field is blank if no subsequent digit type and index was requested.

SEE PROPRIETARY NOTICE ON COVER PAGE

- f Subsequent digit index type. This is the value associated with the ST2 keyword in the input message. This field is blank if no subsequent digit type was requested with the input message.
- g Index value for the subsequent digit type in the ST2 field. The valid range is 0 to 1022 and it corresponds to the index associated with the IDX2 keyword in the input message. The field is blank if no subsequent digit type and index was requested.
- h ABC digits. If area code is Y, a number between 200 and 999; if area code is N, a number between 000 and 999.
- i DEF digits. The fourth, fifth, and sixth digits of a series.
- j GHI digits. The seventh, eighth, and ninth digits that complete the code group definition (0-999).
- k JKL digits. The tenth, eleventh, and twelfth digits of a series.
- l Call type. The major category for the disposition of the codes listed in the message.
- m Call data. For each CALLTYP this field identifies the specific code group treatment.
- n Additional data field 1 (AD1).
- o Additional data field 2 (AD2).
- p Service categories field.
- q Call handling instruction field.
- r Destination separation. Identifies the destination for traffic flow purposes.
- s Dialed number service type.
- t Additional data field 3 (AD3), used to set feature bit indicator.
- u ADC - Acceptable digit counts for the code.
- v Phrases describing any special routing situations for the code:
AIN TRIGGER PRESENT - NUMBER *www*
INTERCHANGEABLE CODE
INTERCHANGEABLE CODE AND AIN TRIGGER PRESENT -
NUMBER *www*
INTERCHANGEABLE CODE AND NON-SHARED POSITIVE LOOK-
UP PRESENT
INTERCHANGEABLE CODE AND SHARED POSITIVE LOOK-
UP PRESENT
NON-SHARED POSITIVE LOOK-UP PRESENT
PERMISSIVE DIALING ALLOWED

SEE PROPRIETARY NOTICE ON COVER PAGE

PROTECTED TO NPA nxx
SHARED POSITIVE LOOK-UP PRESENT
w Decimal number (1-8191).

4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENTs
VRFYIRTG
VRFYOUT
VRFYRTNG

Translation Guide, 4ESSTM, TG-4, Division 8, Section 3

Input Message
VER: CODEGRP

SEE PROPRIETARY NOTICE ON COVER PAGE

ID VER:MEMORY-EM
 WORK CENTER.. MAC, MOC
 GENERIC 4E19 Rel. 2 and later
 APPLICATION .. 4E
 TYPE Output

1. FORMAT

VER:MEMORY;OPT(EM) :

GENERIC TOWN ST BL NBS
 aaaaaaaaaaaaaa aaaa aa aa aaa,

TRANSLATOR INDEX	NUMBER SPARE	NUMBER USED
AIN TRIGGERS	bbbb,	cccc,
AUX RDBI	dddd,	eeee,
CDBI	ffff,	gggg,
CRBI	hhhh,	iiii,
DIGSUPP INDEXES	jjjj,	kkkk,
FENN BLOCKS	llll	mmmm
MCTI	nnnn,	oooo,
MRTI	pppp,	qqqq,
NDBI	rrrr,	ssss,
PRTI	tttt,	uuuu,
RDBI	vvvv,	wwww,
TRUNK BLOCKS	xxxx,	yyyy,
TSG BLOCKS	zzzz,	aaaa,
TTSI	BBBB,	CCCC,
1-DIG BLOCKS	DDDD,	EEEE,
PCPI	FFFF,	GGGG,
PCP-ABCID	HHHH,	IIII,
AUTO SDX INDEXES	JJJJ,	KKKK,
MAN SDX INDEXES	LLLL,	MMMM,
CS BLOCKS	NNNN,	OOOO,
FS BLOCKS	PPPP,	QQQQ,
DLN BLOCKS	RRRR,	SSSS,
TSGHC TBS WORDS	TTTT,	UUUU,
CLIP	VVVV,	WWWW,
DCLIP	XXXX,	YYYY,

LARGEST GROUP IN ADJUNCT ACCESS TABLE zzzzz,

LARGEST GROUP IN ADJUNCT DESTINATION TABLE a¹a¹a¹a¹a¹,

NUMBER OF PAIRS OF NAILED-UP TRUNKS b¹b¹b¹b¹b¹,

NUMBER OF LACID_s ASSIGNED c¹c¹c¹c¹c¹,

SEE PROPRIETARY NOTICE ON COVER PAGE

	NBS	The internal building subdivision for the near end of the TSG.
b		Spare advanced intelligent network (AIN) triggers.
c		Used AIN triggers.
d		Spare auxiliary routing indexes.
e		Used auxiliary routing indexes.
f		Spare customer data block indexes.
g		Used customer data block indexes.
h		Spare customer routing block indexes.
i		Used customer routing block indexes.
j		Spare DIGSUPP indexes.
k		Used DIGSUPP indexes.
l		Spare FENN blocks.
m		Used FENN blocks.
n		Spare multiple carrier treatment indexes.
o		Assigned multiple carrier treatment indexes.
p		Spare multiple routing treatment indexes.
q		Assigned multiple routing treatment indexes.
r		Spare numbering data block indexes.
s		Used numbering data block indexes.
t		Spare proportional routing indexes.
u		Used proportional routing indexes.
v		Spare routing data block indexes.
w		Used routing data block indexes.
x		Spare trunk blocks.
y		Used trunk blocks.
z		Spare trunk-sub-group blocks.
A		Used trunk-sub-group blocks.
B		Spare terminating toll switch indexes.
C		Used terminating toll switch indexes.
D		Spare 1-digit blocks.
E		Used 1-digit blocks.
F		Spare positive call processing (PCP) indexes.

SEE PROPRIETARY NOTICE ON COVER PAGE

G	Assigned PCP indexes.
H	Spare PCP ABCID indexes.
I	Assigned PCP ABCID indexes.
J	Spare automatic subsequent digit indexes.
K	Used automatic subsequent digit indexes.
L	Spare manual subsequent digit indexes.
M	Used manual subsequent digit indexes.
N	Spare call store translations blocks.
O	Used call store translations blocks.
P	Spare file store translations blocks.
Q	Used file store translations blocks.
R	Spare DLN translations blocks.
S	Used DLN translations blocks.
T	Spare trunk sub group head cell (TSGHC) trunk block status (TBS) words.
U	Used TSGHC TBS words.
V	Spare calling line identification presentation (CLIP) indexes.
W	Assigned CLIP indexes.
X	Spare DCLIP indexes.
Y	Assigned DCLIP indexes.
Z	Largest grouping entry in adjunct access table where customers all have the same line number.
a ¹	Largest grouping entry in adjunct destination table where the last four digits of the destination number are the same.
b ¹	Number of nailed up trunks (i.e., number of connections).
c ¹	Number of link access circuit identifiers (LACIDs) assigned.
d ¹	Home numbering plan areas (NPAs).
e ¹	Served NPAs.
f ¹	Space administration use number.
g ¹	Number of 1024-word blocks assigned.
h ¹	Assigned routing domains.

NOTE: For non AT&T office the spare used entries for CLIP and DCLIP will be '0' and the largest group entry contains '0'. list will be printed.

SEE PROPRIETARY NOTICE ON COVER PAGE

4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENTs
IOCPPVR4
VRFYMISC
VRFYOUT

Translation Guide, 4ESS™, TG-4, Division 8

SEE PROPRIETARY NOTICE ON COVER PAGE

Automatic Message Accounting Formatter Function Replacement Feature (384d)

3

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Automatic Message Accounting Formatter Function Replacement Feature (384d)

3

1. Feature Description

- 1.01** The Automatic Message Accounting (AMA) formatter is a kernel level process that performs the following routines:
- Collects recording information on calls from the 1A Processor
 - Formats the AMA records
 - Stores the records on disk.
- 1.02** Currently, updates to the formatter process require that a new formatter be loaded and the old formatter be killed. However, this could affect revenues because of the time it takes the new formatter process to load.
- 1.03** When this feature (AMA Formatter Function Replacement) is activated, the AMA formatter functions will be smaller (split). This will allow formatter process updates without killing the old formatter, thereby decreasing the chance of revenue loss.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Turn On/Turn Off Mechanism

7.01 This feature is turned on automatically by software deployment.

8. Input/Output Manual Pages (Not Affected)

**AT&T 3B20D Conversion to 3-1/2
Inch Small Computer System
Interface (SCSI) Disks Feature
(385)**

4

Contents	Page
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AT&T 3B20D Conversion to 3-1/2 Inch Small Computer System Interface (SCSI) Disks Feature (385)

4

1. Feature Description

1.01 This feature replaces the existing AT&T 3B20D computer 600 MB Small Computer System Interface (SCSI) disk drives with 3-1/2 inch 1 GB SCSI disk drives. The existing 600 MB SCSI disk drives are being discontinued and will no longer be available. The new 1 GB SCSI disk drives will be formatted to provide 600 MB of storage capacity for both system and Automatic Message Accounting (AMA). The additional unused storage capacity will be available for future use.

1.02 This change will affect 4ESS™ switches only when replacements are required. The new disk drives will replace the existing drives directly, providing the same physical appearance and functionality and requiring no software changes except for the 1 GB disk driver software which is included in the 4AP12 load. The driver for the disk is actuated when the Equipment Configuration Database (ECD) is updated to indicate the change.

1.03 To deploy the 3-1/2 inch disk drives, the 4ESS switch must be on 4E18 Release 2. Prior to that point, 600 MB disks must be used.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Turn On/Turn Off Mechanism

7.01 This feature is turned on with the hardware installation and updating of the ECD, as described in Task Oriented Practices (TOP) AT&T 234-153-025, *4ESS™ Switch, Attached Processor System—Growth*. This procedure can be executed only when the 4ESS switch is on 4E18 Release 2 or later. The installation is valid for system disks (MHD0/1) and all AMA disks.

8. Input/Output Manual Pages

8.01 The following output manual pages are affected by this feature:

- OP-MHD-INFO
- OP-DFC-INFO

ID OP:MHD-INFO
WORK CENTER.. MOC
GENERIC 4AP11 and later
APPLICATION .. 4E,3B
TYPE Output

1. FORMAT

This message has six formats.

- [1] OP MHD a INFO NOT STARTED b c
- [2] OP MHD a INFO STOPPED b c
- [3] OP MHD a INFO ERROR b c
- [4] OP MHD a INFO ABORTED b
- [5] OP MHD a INFO
CONTROLLER: DFC d
FIRMCODE VERSION: e
PUMPCODE VERSION: e

UNIT	DID	PORT	STATUS	TRCKS	VTOC	USABLE	RSVD	ESNTL	MATE
MHD f	g	h	i	j	k	l	m	n	o
.

UNIT	DRIVE	UCB	VTOC	SIZES	PRODUCT
MHD f	p	q	r	s	t
.

SEE PROPRIETARY NOTICE ON COVER PAGE

```
[6] OP MHD a INFO
CONTROLLER: DFC d
FIRMCODE VERSION: e
PUMPCODE VERSION: e

SBUS u      SCSI HA BUS v      STATUS: i
UNIT      DID PORT STATUS TRCKS  VTOC  USABLE RSVD ESNTL  MATE
-----
MHD f     g   h     i     j     k     l     m   n   o
.
.
.

UNIT      **** EQUIPAGE SIZE ****  SIZES      PRODUCT
DRIVE     UCB     VTOC    COMPATIBLE  IDENTIFICATION
-----
MHD f     p     q     r     s     t
.
.
.
```

2. REASON FOR OUTPUT

To report the result of executing an OP :MHD ; INFO input message.

Format 5 is used to output data for an storage module device (SMD) moving head disk (MHD).

Format 6 is used to output data for a small computer system interface (SCSI) MHD.

3. VARIABLE FIELD DEFINITIONS

- a MHD member number.
- b Process step or reason code.
 - f01 — failed to enable message reception
 - f03 — failed to open ECD
 - f06 — failed to get UCB by name
 - f09 — failed to get UCB of SBUS
 - f0c — failed to get UCB of DFC
 - f0e — failed to get UCB of DFC
 - f11 — failed to assign SDF name for DFC
 - f14 — failed to open SDF for DFC
 - f17 — see DKDRV report on the ROP
 - f1a — failed to close special device file
 - f1c — failed to release special device file
 - f1f — failed to unreserve DFC UCB
 - f23 — failed to get next UCB
 - f26 — failed to assign SDF name for MHD
 - f29 — failed to open SDF for MHD
 - f2c — failed to set I/O mode of device file

SEE PROPRIETARY NOTICE ON COVER PAGE

- f2f — see DKDRV report on the ROP
 - f33 — see DKDRV report on the ROP
 - f36 — failed to close MHD SDF
 - f37 — failed to release MHD SDF
 - f38 — failed to unreserve MHD UCB
 - f3e — message to port failure
 - f43 — message reception failure
 - f46 — process timed out
 - f49 — failed to close special device file
 - f4c — failed to release special device file
 - f4f — failed to unreserve UCB
 - f53 — failed to close ECD
 - f56 — terminated externally with signal
- c System error code number. See the System Error Codes Output Appendix, SYSERR-APP.
- d Unit number of controller.
- e DFC firmware/pumpcode version.
A . B . C — D
- A Version of DFC FIRMWARE/PUMPCODE.
 - B Issue of DFC FIRMWARE/PUMPCODE.
 - C Point issue of DFC FIRMWARE/PUMPCODE.
 - D Laboratory design issue (LDI) of DFC FIRMWARE/PUMPCODE.
- NAV — The firmware or pumpcode versions are not available, or cannot be determined.
- NAP — The pumpcode version is not applicable for SMD DFCs.
- f Unit number.
- g Device ID (drive ID number).
- h Physical port.
The physical port number is where the SMD MHD is connected to the DFC.
- data — Physical port number.
 - NAV — The DFC is not available, or the DFC is reserved, or the SMD DFC firmware/pumpcode version is earlier than 3.2.0.
 - NAP — Not applicable for SCSI disks.
- i Major status of unit.
- j Number of tracks on the disk drive.

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The drive size is determined by reading the equipage value in the UCB record for the unit.

160MB — (SMD disk drive)

300MB — (SMD disk drive)

322MB — (SCSI disk drive)

340MB — (SMD disk drive)

600MB — (SCSI disk drive)

1000MB — (SCSI disk drive)

NAV — The DFC is not active,
or the unit is reserved.

r

Equipage size based on the VTOC.

The drive size is derived from the maximum capacity of the unit's VTOC.

160MB — (SMD disk drive)

300MB — (SMD disk drive)

322MB — (SCSI disk drive)

340MB — (SMD disk drive)

600MB — (SCSI disk drive)

1000MB — (SCSI disk drive)

NAV — The DFC is not active,
or the unit is reserved,
or the unit is inaccessible.

s

Sizes compatible.

YES — DRIVE, UCB, and VTOC equipage sizes are compatible.

NO — DRIVE, UCB, and VTOC equipage sizes are not compatible.

NAV — At least one of the equipage sizes are not available.

Equipage sizes are not compatible if the drive size is not equal to the UCB equipage size or if the drive size is smaller than the VTOC size.

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Size comparisons are based on the formatted capacity of a disk drive. The formatted capacity of the AT&T RTR-supported disk drives are as follows:

Drive	Formatted Capacity
160MB	133MB
300MB	253MB
322MB	322MB
340MB	277MB
600MB	604MB
1000MB	1000MB

- t **Product identification.**
- NAP — Not applicable for SMD disks.
 - NAV — The DFC is not active,
 or the unit is reserved,
 or the SCSI MHD is inaccessible.
 - data — Alphanumeric data representing the product identification of
 a SCSI disk.
- u **SBUS unit number if the DFC is a SCSI device.**
- Unit Number — Logical unit number of the SCSI bus that is stored in
 the SBUS's UCB.
- v **SCSI HA bus identification number, either 0 or 1.**

4. ACTION TO BE TAKEN

A termination report specifying completion indicates all directives of the input request were done and no failures were encountered.

A termination report specifying noncompletion that provides an error code usually indicates a system resource was not available, or became unavailable to perform the requested task. Clear the problem causing the resource limitation and try the request again.

For Formats 5 and 6, if the drive equipage sizes are not compatible, verify the correctness of the UCB equipage value. If there is still an inconsistency, contact the next level of technical assistance.

5. REFERENCES

OMDB Keys

Formats 1 through 4 have an OMDB key of 153.

Format 5 has an OMDB key of 151.

Format 6 has an OMDB key of 572.

Output Appendix

SYSERR-APP

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4ESS/APS
OM-4A001-01

OP MHD INFO

Input Messages
OP : DFC ; INFO
OP : MHD ; INFO

SEE PROPRIETARY NOTICE ON COVER PAGE

ID OP:DFC-INFO
WORK CENTER.. MOC
GENERIC 4AP11 and later
APPLICATION .. 4E,3B
TYPE Output

1. FORMAT

This message has eight formats.

- [1] OP DFC a INFO NOT STARTED b c
- [2] OP DFC a INFO STOPPED b c
- [3] OP DFC a INFO ERROR b c
- [4] OP DFC a INFO ABORTED b
- [5] OP DFC a INFO
FIRMWARE VERSION: d
PUMPCODE VERSION: d
NO MHD UNITS EQUIPPED
- [6] OP DFC a INFO
FIRMWARE VERSION: d
PUMPCODE VERSION: d

UNIT	DID	PORT	STATUS	TRCKS	VTOC	USABLE	RSVD	ESNTL	MATE
MHD e	f	g	h	i	j	k	l	m	n
.

UNIT	DRIVE	UCB	VTOC	SIZES	PRODUCT
**** EQUIPAGE SIZE ****				COMPATIBLE	IDENTIFICATION
MHD e	o	p	q	r	s
.

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[7] OP DFC a INFO
FIRMWARE VERSION: d
PUMPCODE VERSION: d

SBUS t	SCSI HA BUS u				STATUS: h				
UNIT	DID	PORT	STATUS	TRCKS	VTOC	USABLE	RSVD	ESNTL	MATE
MHD e	f	g	h	i	j	k	l	m	n

UNIT	**** EQUIPAGE SIZE ****			SIZES	PRODUCT
DRIVE	UCB	VTOC	COMPATIBLE	IDENTIFICATION	
MHD e	o	p	q	r	s

[8] OP DFC a INFO
FIRMWARE VERSION: d
PUMPCODE VERSION: d

SBUS t	SCSI HA BUS u				STATUS: h				
UNIT	DID	PORT	STATUS	TRCKS	VTOC	USABLE	RSVD	ESNTL	MATE
MHD e	f	g	h	i	j	k	l	m	n

UNIT	**** EQUIPAGE SIZE ****			SIZES	PRODUCT
DRIVE	UCB	VTOC	COMPATIBLE	IDENTIFICATION	
MHD e	o	p	q	r	s

SEE PROPRIETARY NOTICE ON COVER PAGE

SBUS t	SCSI HA BUS u			STATUS: h					
UNIT	DID	PORT	STATUS	TRCKS	VTOC	USABLE	RSVD	ESNTL	MATE
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
MHD e	f	g	h	i	j	k	l	m	n
.									
.									
.									

UNIT	**** EQUIPAGE	SIZE ****	SIZES	PRODUCT
DRIVE	UCB	VTOC	COMPATIBLE	IDENTIFICATION
-----	-----	-----	-----	-----
MHD e	o	p	q	r
.				s
.				
.				

2. REASON FOR OUTPUT

To report the result of executing an OP :DFC; INFO input message.

Format 5 is output when all of the subunits of the disk file controller (DFC) are unequipped.

Format 6 is used to output data for a SMD DFC.

Format 7 is used to output data for a small computer system interface (SCSI) DFC equipped with only one SCSI bus (SBUS).

Format 8 is used to output data for a SCSI DFC equipped with more than one SBUS.

3. VARIABLE FIELD DEFINITIONS

- a DFC member number.
- b Process step or reason code.
 - f01 — failed to enable message reception
 - f03 — failed to open ECD
 - f06 — failed to get UCB by name
 - f09 — failed to get UCB of SBUS
 - f0c — failed to get UCB of DFC
 - f0e — failed to get UCB of DFC
 - f11 — failed to assign SDF name for DFC
 - f14 — failed to open SDF for DFC
 - f17 — see DKDRV report on the ROP
 - f1a — failed to close special device file
 - f1c — failed to release special device file
 - f1f — failed to unreserve DFC UCB
 - f23 — failed to get next UCB
 - f26 — failed to assign SDF name for MHD
 - f29 — failed to open SDF for MHD
 - f2c — failed to set I/O mode of device file

SEE PROPRIETARY NOTICE ON COVER PAGE

f2f — see DKDRV report on the ROP
f33 — see DKDRV report on the ROP
f36 — failed to close MHD SDF
f37 — failed to release MHD SDF
f38 — failed to unreserve MHD UCB
f3e — message to port failure
f43 — message reception failure
f46 — process timed out
f49 — failed to close special device file
f4c — failed to release special device file
f4f — failed to unreserve UCB
f53 — failed to close ECD
f56 — terminated externally with signal

c System error code number. See System Error Codes Output Appendix, SYSERR-APP.

d DFC firmware/pumpcode version.

A . B . C — D

A Version of DFC FIRMWARE/PUMPCODE.

B Issue of DFC FIRMWARE/PUMPCODE.

C Point issue of DFC FIRMWARE/PUMPCODE.

D Laboratory Design Issue (LDI) of DFC FIRMWARE/PUMPCODE.

NAV — The firmware or pumpcode versions are not available, or cannot be determined.

NAP — The pumpcode version is not applicable for SMD DFCs.

e Unit number.

f Device ID (drive ID number).

g Physical port.

The physical port number is where the SMD MHD is connected to the DFC.

data — Physical port number.

NAV — The DFC is not available, or the DFC is reserved, or the SMD DFC firmware/pumpcode version is earlier than 3.2.0.

NAP — Not applicable for SCSI disks.

h Major status of unit.

i Number of tracks on the disk drive.

data — Decimal number of disk tracks.

NAV — DFC is not available, or the unit is reserved.

SEE PROPRIETARY NOTICE ON COVER PAGE

- NAP — Not applicable for SCSI disks.
- j Validity of the volume table of contents (VTOC).
- VALID — VTOC has a valid VTOC entry.
 - INVALID — Could not find a valid VTOC entry.
 - UNRDBLE — Read error while trying to read VTOC.
 - NAV — Could not reserve unit - VTOC not read.
- k Usability.
- YES — Disk is considered usable.
 - NO — Disk data integrity is unknown.
- l Unit reserved.
- YES — Unit is reserved for maintenance activity.
 - NO — Unit is not reserved.
- m Unit essential.
- data — Hexadecimal value of the essential field of the unit's UCB.
- n Unit's mate.
- Unit — Name and unit number of duplex mate.
 - SMPLX — Unit has no mate.
- o Equipage size based on the physical drive.
- For SCSI disks, the physical drive size is determined by reading the capacity of the disk from the disk drive itself. For SMD disks, the physical drive size is determined by reading the equipage value in the UCB record.
- 160MB — (SMD disk drive)
 - 300MB — (SMD disk drive)
 - 322MB — (SCSI disk drive)
 - 340MB — (SMD disk drive)
 - 600MB — (SCSI disk drive)
 - 1000MB — (SCSI disk drive)
 - NAV — The DFC is not active, or the SCSI MHD is inaccessible, or the unit is reserved.
- p Equipage size based on the UCB equipage value.

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The drive size is determined by reading the equipage value in the UCB record for the unit.

160MB — (SMD disk drive)

300MB — (SMD disk drive)

322MB — (SCSI disk drive)

340MB — (SMD disk drive)

600MB — (SCSI disk drive)

1000MB — (SCSI disk drive)

NAV — The DFC is not active,
or the unit is reserved.

q

Equipage size based on the VTOC.

The drive size is derived from the maximum capacity of the unit's VTOC.

160MB — (SMD disk drive)

300MB — (SMD disk drive)

322MB — (SCSI disk drive)

340MB — (SMD disk drive)

600MB — (SCSI disk drive)

1000MB — (SCSI disk drive)

NAV — The DFC is not active,
or the unit is reserved,
or the unit is inaccessible.

r

Sizes compatible.

YES — DRIVE, UCB, and VTOC equipage sizes are compatible.

NO — DRIVE, UCB, and VTOC equipage sizes are not compatible.

NAV — At least one of the equipage sizes are not available.

Equipage sizes are not compatible if the drive size is not equal to the UCB equipage size or if the drive size is smaller than the VTOC size.

SEE PROPRIETARY NOTICE ON COVER PAGE

Size comparisons are based on the formatted capacity of a disk drive. The formatted capacity of the AT&T RTR-supported disk drives are as follows:

Drive	Formatted Capacity
160MB	133MB
300MB	253MB
322MB	322MB
340MB	277MB
600MB	604MB
1000MB	1000MB

- s **Product identification.**
 - NAP — Not applicable for SMD disks.
 - NAV — The DFC is not active, or the unit is reserved, or the SCSI MHD is inaccessible.
 - data — Alphanumeric data representing the product identification of a SCSI disk.
- t SBUS unit number if the DFC is a SCSI device.
 - Unit Number — Logical unit number of the SCSI bus that is stored in the SBUS's UCB.
- u SCSI HA bus identification number: either 0 or 1.

4. ACTION TO BE TAKEN

A termination report specifying completion indicates all directives of the input request were done and no failures were encountered. If any unit of the associated DFC is reserved, however, certain fields will contain information that is not available. For more complete information, try the message again after the unit is released.

A termination report specifying noncompletion that provides an error code usually indicates a system resource was not available, or became unavailable to perform the requested task. Clear the problem causing the resource limitation and try the request again.

For Formats 6, 7, and 8, if the drive equipage sizes are not compatible, verify the correctness of the UCB equipage value. If there is still an inconsistency, contact the next level of technical assistance.

SEE PROPRIETARY NOTICE ON COVER PAGE

5. REFERENCES

OMDB Keys

Formats 1 through 4 have an OMDB key of 153.

Format 5 has an OMDB key of 152.

Format 6 has an OMDB key of 150.

Format 7 has an OMDB key of 570.

Format 8 has an OMDB key of 571.

Output Appendix

SYSERR-APP

Input Messages

OP:DFC;INFO

OP:MHD;INFO

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Announcement System Manager—Plus Interface with Service Circuit Units Feature (386)

5

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Announcement System Manager—Plus Interface with Service Circuit Units Feature (386)

5

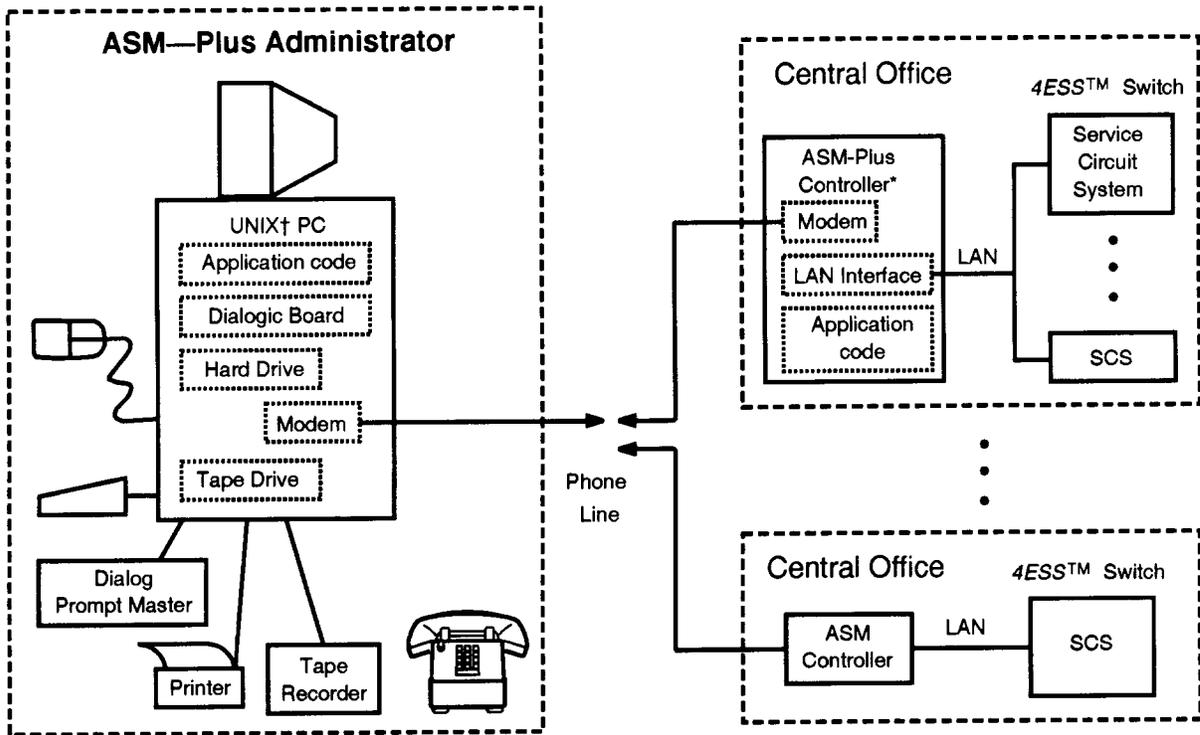
1. Feature Description

1.01 The Announcement System Manager—Plus (ASM-Plus) is a cost effective announcement administration system that initiates announcement updates to Service Circuit Systems for the Local Exchange Carriers (LECs). The ASM-Plus consists of two main hardware components: the ASM-Plus Administrator and the ASM-Plus Controller. The ASM-Plus Administrator, a PC-based system, is where the end users administer announcement activities. The ASM-Plus Administrator interfaces with the ASM-Plus Controller using high speed modems and an analog line. At each Service Circuit System (SCS), the ASM-Plus Controller with a continuous link to the SCS updates the announcements, maintains status, and reports error conditions to the ASM-Plus Administrator. The ASM-Plus Controller has a high speed Local Area Network (LAN) interface to the Service Circuit Unit of the SCS. See Figure 5-1.

⇒ NOTE:

One ASM-Plus Administrator can administer multiple SCSs in multiple 4ESS™ switch offices from a central location. Note that one ASM-Plus Controller is required for each 4ESS switch.

1.02 With this feature, all standard, prerecorded announcements and custom announcements are digitally encoded and then stored in speech files on the hard disk of the ASM-Plus Administrator workstation. The user can then play back and, if desired, edit the Pulse Code Modulation (PCM) copy of the announcement. The PCM copy of the announcement on the ASM-Plus Administrator can be edited at any time. When the user is satisfied with the announcement, it is then ready to be transmitted to the SCS announcement system by way of the ASM-Plus Controller. When transmitted,



* For maintenance of ASM-Plus Controller, terminal with keyboard, display and serial I/O required
 † UNIX is a registered trademark of UNIX System Laboratories, Inc.

Legend:
 ASM-Plus - Announcement System Manager—Plus
 LAN - Local Area Network
 PC - Personal Computer
 SCS - Service Circuit System

tpa 838104/01

Figure 5-1. Announcement System Manager—Plus Architecture

the PCM formatted announcement is converted to 32 kbps Adaptive Differential Pulse Code Modulation (ADPCM) to be compatible with the SCS format. A large number of PCM announcements can be stored on the hard disk of the ASM-Plus Administrator workstation (up to the capacity of the hard disk itself). After announcements are edited to the satisfaction of the user and transmitted to the SCS announcement system, they should be transferred to computer tape for backup purposes and to free up hard disk space. The ADPCM copies of announcement are not stored on the hard disk of the ASM-Plus Administrator workstation.

Feature Characteristics

1.03 The ASM-Plus Administrator is comprised of both hardware and software and is a single, centralized microcomputer system that initiates announcement updates to some or all of the SCSs in the network. The administrator can be situated locally or remotely from the SCS. Note that the administrator must be located in a normal office setting as the ASM-Plus is based on a PC platform and is not central office compatible with respect to Network Equipment Building Standards (NEBS) requirements. A database is maintained by the ASM-Plus Administrator that contains the status of all announcements in the Service Circuit Units (SCUs). When an announcement update is needed, the ASM-Plus Administrator sends an update request to the ASM-Plus Controller by high speed modems and POTS connection.

1.04 The user communicates with the ASM-Plus Administrator through a series of menus. This interface allows the user to execute database commands and administrative functions, and to view error logs and audit trails. The database commands allow the user to add, delete, update, query, and view data in the database. The database contains data about the 4ESS switches being administered, SCS controllers, SCUs, and announcements on an SCU. The administrative functions include backing up the database, restoring the database, logging ASM-Plus Administrator commands, logging errors, installing ASM-Plus Administrator upgrades, starting programs, and maintaining the installation log.

1.05 The ASM-Plus Controller is comprised of hardware and software located in an office near the 4ESS switch frame and performs the updates requested by the centralized ASM-Plus Administrator. Note that the ASM-Plus Controller must be located in a normal office setting as the Controller is not fully central office compatible with respect to NEBS. The ASM-Plus Controller does the recording, deleting, replacing, and assigning of announcements to all the SCUs that it serves. The ASM-Plus Controller verifies contents and assignments, monitors the connectivity to and the status of the SCUs, and reports error conditions to the ASM-Plus Administrator. The ASM-Plus Controller is continuously connected to the SCU through a high speed Ethernet LAN. The ASM-Plus Controller is connected to the ASM-Plus Administrator through a dial-up connection. Announcements are updated by the ASM-Plus Controller on the SCU as instructed by the ASM-Plus Administrator, and the ASM-Plus Controller reports the results back to the ASM-Plus Administrator. In addition to performing several administrative functions on its associated SCUs, the ASM-Plus Controller runs

connectivity tests on a regular basis to ensure that the connection between the SCU and the ASM-Plus Controller is maintained. The ASM-Plus Controller also maintains logs of all update activity that has occurred on the SCUs and of all the errors that have occurred during the updating by local administration.

A. ASM-Plus Administrator Hardware

1.06 The minimum hardware required for the ASM-Plus Administrator operation is as follows:

- 486DX2 66MHz processor with ISA/EISA channel, 16 MB DRAM, 1-540 MB SCSI hard disk, 1-1.44 MB 3.5 inch floppy drive, and keyboard
- 14-inch SVGA color monitor
- Dialogic D/21D voice communication system
- Dialogic PromptMaster
- SONY* TCM-5000EV tape deck
- Adaptec SCSI Controller 1542CF
- AT&T *Paradyne*® 3221-B1 001 modem
- Modem cable
- Parallel letter quality printer
- Serial mouse.

B. ASM-Plus Administrator Software

1.07 The software required for ASM-Plus operation is as follows:

- UNIVEL UNIXware Personal Edition SVR 4.2.1.1
- UNIVEL UNIXware Personal Utilities SVR 4.2.1.1
- ORACLE† Relational Database Management System (RDBMS) Version 7.0
- ORACLE SQL Plus
- ORACLE Pro C
- Dialogic Voice Driver UNIX‡, Release 4.0
- Dialogic Phrase Editor (PHRED) Speech Utility, Version 1.1

* SONY is a registered trademark of the Sony Corporation.

† ORACLE is a registered trademark of the ORACLE Corporation.

‡ UNIX is a registered trademark of UNIX System Laboratories, Inc.

- ASM System Software, Version 1.0.

For database access, the ASM-Plus Administrator uses ORACLE RDBMS. The ASM-Plus Administrator includes a set of programs with embedded SQL commands to perform all of the necessary database management functions from Forms and Menu Language Interpreter (FMLI) forms. The NOVELL* personal utilities package includes an FMLI package. FMLI defines the menus and forms for the user interface with the ASM-Plus Administrator.

C. ASM-Plus Administrator Optional Software

- 1.08 The optional software for the ASM-Plus Administrator is the ORACLE Report Writer.

D. ASM-Plus Controller Hardware

- 1.09 The ASM-Plus Controller consists of the following existing commercial products:
- 486DX2 66MHz processor with ISA/EISA channel, 16 MB DRAM, 1-540 MB SCSI hard disk, 1-1.44 MB 3.5 inch floppy drive, and -48 volt DC power converter
 - Adaptec SCSI Controller 1542CF
 - SMC EtherCARD Plus Elite 16 adaptor coaxial Model 8013
 - AT&T Paradyne Modem 3221-B1-001
 - System Integration and Test
 - ATI† Integra VGA card
 - Archive Maynard 250 MB SCSI Tape.

E. ASM-Plus Controller Optional Hardware

- 1.10 The following hardware is required at the time of installation:
- Keytronics Keyboard
 - MICROSOFT‡ Serial Mouse
 - NEC§ Monitor, SVGA capable
 - Repeater (based on distance between Controller and SCU).

* NOVELL is a registered trademark of NOVELL, Inc.

† ATI is a registered trademark of ATI Technologies, Inc.

‡ MICROSOFT is a registered trademark of Microsoft Corporation.

§ NEC is a registered trademark of the Nippon Denki Kabushiki Kaisha.

F. ASM-Plus Controller Software

1.11 The software required for ASM-Plus Controller operation is as follows:

- NOVELL UNIXware Personal Edition SVR 4.2.1.1
- UNIVEL UNIXware Personal Utilities SVR 4.2.1.1
- ASM-Plus Controller Application Software Version 1.0.

G. Cables and Miscellaneous

1.12 Miscellaneous hardware and cables required for operation are as follows:

- Ethernet BNC cable (X-Dim) (190M max)
- BNC Terminator, AMP Plug Terminal
- Transceiver AUI Adapter, EAZY components
- Transceiver Cables DB15 type, EAZY components.

H. Analog Line (s)

1.13 One analog line is required for each ASM-Plus Administrator and Controller. It is the responsibility of the customer to order and provision the analog line (s).



NOTE:

AT&T is offering a Turnkey solution for the AT&T hardware and software which is AT&T certified. If a customer chooses to provide his or her own hardware and operating system, the customer is responsible for ensuring compatibility between hardware and operating system and the ASM-Plus application.

ASM-Plus Administrator and ASM-Plus Controller Interface

1.14 The ASM-Plus Administrator exchanges messages and data with the SCS through the ASM-Plus Controller. The ASM-Plus Administrator connects to the ASM-Plus Controller through a high speed modem and a phone line. The following statements reflect the interface exchange between these units:

- The ASM-Plus Administrator initiates the session with the ASM-Plus Controller via modem link.
- When a session is to be set up between the ASM-Plus Administrator and the ASM-Plus Controller, a password is sent via the modem from the ASM-Plus Administrator to the ASM-Plus Controller for security protection. If the password check fails, then the session is torn down.

- Both administrator and controller hang up.
- The controller calls back the administrator.
- When the administrator answers, the controller transmits a password. If the password check fails, then the session is torn down.
- The ASM-Plus Administrator sends a message with control parameters and the relevant data to the ASM-Plus Controller to perform the desired update function on the SCS.
- The ASM-Plus Administrator is able to support a total of 128 SCUs per 4ESS switch, but the ASM-Plus Administrator administers only 1 SCU at a time.

A. ADPCM Audio Data

1.15 The ASM-Plus Administrator sends and receives announcement audio in 32 kbps ADPCM. This capability is used for announcement verification and announcement updates. The announcement audio is encoded using 32 kbps International Telecommunications Union (ITU-T) G.721 ADPCM and packed into 8-bit bytes. The lower 4 bits of the byte (bits 0 through 3) represent the first 4 bit ADPCM nibble; the upper 4 bits (bits 4 through 7) represent the second 4 bit ADPCM nibble within the byte.

Security

1.16 The ASM-Plus Administrator uses existing UNIX security features to control access to the system. It is the responsibility of the ASM-Plus System Administrator (from the LEC) to set up appropriate UNIX and database security restrictions for end users.

SCS Announcement Administer Functions

1.17 There are four functions associated with administering SCS announcements using the ASM-Plus: Record, Delete, Replace, and Assign.

A. Recording Announcements

1.18 Announcements are first stored on the ASM-Plus Administrator hard disk in a digitally encoded format (PCM) before being recorded on the SCS. A voice communication system on the ASM-Plus Administrator allows the user to add new announcements, edit existing announcements, or playback existing announcements stored on the hard disk. Announcements can be added to the hard disk by:

- Recording announcements live at the ASM-Plus Administrator using the PromptMaster

- Pre-recording analog announcements (that is, professional recording studio) and loading the tape onto the ASM-Plus Administrator
- Pre-recording announcements and saving the announcements in digital (PCM) format, and then loading the file onto the ASM-Plus Administrator.

The ASM-Plus Administrator converts analog announcements into PCM format before being stored on the hard disk. After the announcements are stored on the hard disk, they can be edited and/or played back. When the announcements are determined to be correct, they are converted from PCM to ADPCM, to conform to the SCS format, and downloaded to the ASM-Plus Controller. The ASM-Plus Controller records the announcement on the SCS Announcement System. Only the PCM format of the announcement is saved on the hard disk.

B. Deleting Announcements

- 1.19** The Delete announcement function deletes an announcement from the specified SCU.

C. Replacing Announcement

- 1.20** The Replace function exchanges the announcement message and checksum between two announcements previously recorded on the SCS without changing the announcement number. This function may be used when the service requesting the announcement cannot easily be modified to request a different announcement.

D. Assigning Announcements

- 1.21** The Assign function only relates to Network and MAS Announcements. The Assign function activates Network or MAS Announcements by placing the announcement number into either a Network or MAS mapping table that exists in the switch.

ASM-Plus Administrator Reports

- 1.22** The following information is available to the user either for viewing or for printing:
- Single Announcement List—provides the contents of the specified announcement record to the user
 - Multiple Announcements by Library List—provides contents of the specified announcement records to the user
 - Multiple Announcements by Customer List—provides contents of the specified announcement records to the user

- Multiple Announcement by Office List—provides the contents of the specified announcement records to the user
- Office Data List—provides contents of the specified office records to the user.

Estimated Download Times

1.23 The time required to download an announcement to the SCU is dependent upon the connectivity between the ASM-Plus and the SCU. Table 5-A illustrates the download times.

Table 5-A. Announcement Download Time to SCU

Announcement Length	MODEM Data Rate in Seconds (Non-compressed)*				LAN Data Rate
	4800	9600	14400 †	19200	10MB
10 Seconds	85	43	28	21	Less than 2 Seconds
20 Seconds	171	85	57	43	Less than 2 Seconds
30 Seconds	256	128	85	64	Less than 2 Seconds
40 Seconds	341	171	114	85	Less than 2 Seconds
50 Seconds	427	213	142	107	Less than 2 Seconds
60 Seconds	512	256	171	128	Less than 2 Seconds

* Download Time Calculation as follows:

$$\text{Download Time} = \text{Blocksize} \times \text{Announcement time} \times \text{Byte size} / \text{Data rate} \times \text{Efficiency}$$

where:

Blocksize = 4096 bytes (minimum blocksize to hold one second or less announcement)

Announcement Time = Length of announcement in seconds

Byte Size = Number of bits per byte

Data Rate = Speed of transmission bits

Efficiency = Expected throughput of transmission media

† AT&T's Turnkey solution supports the 14400 second data rate.

2. Call Flow Scenario

2.01 The interface between the ASM-Plus Administrator and the ASM-Plus Controller is controlled by the ASM-Plus Administrator. Through this interface, the user is able to download to and receive from the ASM-Plus Controller. The download consists of executable scripts and, when appropriate, encoded announcements being sent to the Controller. The Controller then executes the scripts and sends the announcements on to the SCU. Executable scripts instruct the ASM-Plus Controller to record, delete, retrieve, replace or assign announcements, collect information about the SCU, and perform administrative functions. The scenario for a session between the ASM-Plus Administrator and Controller is as follows:

1. When the user initiates a session on the ASM-Plus Administrator, a menu of commands (that is, record, delete, assign, retrieve) for updating the SCU are presented. The user selects the update commands and enters the requested data (that is, 4ESS switch CLLI* code, SCC number, SCU number, and announcement number). The user then selects the "send to SCU function". The ASM-Plus Administrator and the ASM-Plus Controller perform the following steps automatically.
2. The ASM-Plus Administrator dials the telephone number for the ASM-Plus Controller.
3. When the ASM-Plus Controller answers, the ASM-Plus Administrator transmits a password to the ASM-Plus Controller.
4. Both the ASM-Plus Administrator and the ASM-Plus Controller hang up.
5. The ASM-Plus Controller calls back the ASM-Plus Administrator.
6. When the ASM-Plus Administrator answers, the ASM-Plus Controller transmits a password.
7. The ASM-Plus Administrator transmits the command script and, when appropriate, an encoded announcement.
8. The ASM-Plus Controller executes the script and returns the status to the ASM-Plus Administrator.
9. Both the ASM-Plus Administrator and the ASM-Plus Controller hang up.
10. The ASM-Plus Administrator adds the reply from the ASM-Plus Controller and updates the database.

* COMMON LANGUAGE is a registered trademark and CLEI, CLLI, CLCI, and CLFI are trademarks of Bell Communications Research, Inc.

**NOTE:**

If the administrator and controller disconnect before the status of the update is sent by the controller, the controller calls back the administrator to repeat the status.

3. Provisioning

Office Data Administration (ODA) Forms Forms Affected

- 3.01** Two new fields have been added to ODA Form 406Z. One field indicates whether an announcement administration system is available, and the second field indicates the type of announcement administration system.

Recent Change (RC) Forms Affected

- 3.02** Two new fields need to be populated in the 800 series RC forms. One field indicates whether an announcement administration system is available, and the second field indicates the type of announcement administration system. Depending on the generic and the release when the announcement administration system is installed, different RC forms must be used. For generic 4E18 Release 2 implementation, use RC Form 800. For generic 4E18 Release 3 and beyond, use RC Form 809.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

SCS Announcement Maintenance Functions

- 6.01** The basic announcement maintenance functions are as follows:
- Audio statistics compare
 - SCU and ASM-Plus AAM compare.

A. Audio Statistics Compare

6.02 The audio statistics compare function compares the statistics for a single announcement with those in the master announcement database and prints the results. The audio statistics for a single announcement are taken from an announcement library located on an SCU. The audio statistics for an announcement consist of the announcement length in SCU seconds and checksum data.

B. SCU and ASM-Plus AAM Compare (Network Announcement Only)

6.03 The SCU and ASM-Plus AAM compare function compares the AAM slots for the announcements in the announcement library located on an SCU with those in the ASM-Plus Administrator's master announcements table and prints the results.

7. Transition Considerations

Turn On/Turn Off Mechanism

7.01 This feature is turned on by hardware and software deployment. The ASM-Plus hardware must be installed and the proper fields in the ODA forms and RC forms must be populated for this system to operate properly. Refer to "Provisioning" section in this chapter.

8. Input/Output Manual Pages (Not Affected)

Ring Node Version Number Feature (395)

6

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Ring Node Version Number Feature (395)

6

1. Feature Description

1.01 Before the introduction of the Ring Node Version Number feature, it was difficult to determine if the AT&T 3B20D computer disk and the operating ring node were both working on the same version of the node processor file (lvfile). Lack of concurrency in the lvfiles can result in call failures.

1.02 The Ring Node Version Number feature performs verification of the node processor file on the 3B20D computer and the operating ring node to ensure lvfile concurrency. If there is lvfile concurrency, no action is necessary. However, if the files are not concurrent, a remove and restore must be done manually on the node to bring about concurrency.

1.03 The following three processes comprise this feature, although the first two are transparent to the craft:

- **make_time**—populates the node processor's memory with a new timestamp section and symbol
- **write_time**—writes the build time of the .lv product to the new timestamp section
- **ver:lvfile**—compares the 3B20D computer disk against the node processor timestamp and reports the results. This command is a craft command.

2. Call Flow (Not Affected)

3. Provisioning

Data Components Affected

3.01 The following processor files are affected:

- International System 7 Nodes
 - IC71.lv
 - ICNI7.lv
 - ICNIT7.lv
 - ICT71.lv

- Domestic System 7 Nodes
 - SDSP.lv
 - IDSP.lv
 - C71.lv
 - CNI7.lv

- Direct Link Nodes (DLNs)
 - DLN4E.lv
 - DLN80.lv

- Small Computer System Interface (SCSI) Node
 - sin.lv

- D-Channel Nodes
 - PBXD3.lv
 - PBXT3.lv

- Special Access Data Channel (SADC) Nodes
 - PBXS.lv
 - PBXS2.lv
 - PBXS3.lv
 - PBXS4.lv

- 3.02 This data component is accessed by means of the VER:LVFILE craft command.
- 3.03 The command formats are detailed in the Input and Output Manual pages at the end of this chapter.
- 3.04 The possible error conditions are indicated on the attached Output Manual pages.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Turn On/Turn Off Mechanism

- 7.01 This feature is turned on automatically by software deployment.

Ubiquity

- 7.02 Ubiquity of the release throughout the network is not required for the operation of this feature.

8. Input/Output Manual Pages

- 8.01 Two new messages were created to support this feature: the VER:LVFILE input message and the VER:LVFILE output message.
- 8.02 A copy of those manual pages is attached.

ID VER:LVFILE
WORK CENTER.. MOC
GENERIC 4AP12 Rel. 2 and later
APPLICATION .. 4E
TYPE Input

1. PURPOSE

This message invokes the concurrency verification between the 3B20D copy of the `lvfile` and the ring node copy of the `lvfile`. This is done by comparing a timestamp variable of the two copies.

2. FORMAT

- [1] **VER:LVFILE;LNaa bb!**
- [2] **VER:LVFILE;ALL!**

3. EXPLANATION OF MESSAGE

Formats 1 and 2 print whether the two copies of the `lvfile` are consistent or inconsistent with the timestamp data given a node ID. The node ID can only be a link node (LN).

- aa Frame (00 - 63)
- bb Member (01 - 15)

4. SYSTEM RESPONSE

PF Followed by VER-LVFILE output message.

5. REFERENCES

Output Message
VER-LVFILE

SEE PROPRIETARY NOTICE ON COVER PAGE

ID VER:LVFILE
WORK CENTER.. MOC
GENERIC 4AP12 Rel. 2 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

The following formats correspond to the input formats given in the VER:LVFILE input message. Format 2 shows error messages indicating incorrect data in the message or possible code failures.

[1] VER LVFILE LNaa bb IN PROGRESS

FRAME = aa GROUP = bb RNA = cccc
3B20 TIMESTAMP = dd/ee/ff gg:hh:ii
NODE TIMESTAMP = dd/ee/ff gg:hh:ii

LVFILEs ARE j

VER:COMPLETE MESSAGE: CODE 5

[2] VER LVFILE LNaa bb COMPLETED

k

VER:COMPLETE MESSAGE: CODE 5

2. REASON FOR OUTPUT

Format 1. This is in response to previously input VER:LVFILE message.

Format 2. This message gives diagnostic information on internal problems found in the code or with the message.

3. VARIABLE FIELD DEFINITIONS

aa Frame number (00 - 64).
bb Member number (00 - 15).
cccc Ring node address (RNA) (0001 - 1023).
dd Timestamp month.
ee Timestamp day.
ff Timestamp year.
gg Timestamp hours.

SEE PROPRIETARY NOTICE ON COVER PAGE

hh	Timestamp minutes.
ii	Timestamp seconds.
j	Result: CONSISTENT INCONSISTENT
k	Error message: COULD NOT CREATE TEMP FILE COULD NOT OPEN PRINT STREAM ERROR GETTING 3B TIMESTAMP ERROR GETTING .LV NAME ERROR GETTING NODE TIMESTAMP INVALID MESSAGE INVALID RNA SNAKE INACCESSIBLE UCB DATA INACCESSIBLE FEATURE

4. ACTION TO BE TAKEN

Format 1. These are normal output messages in response to the corresponding format in the VER:LVFILE input message.

Format 2. Check the message for correctness or there is potential errors in the verify code. Seek technical assistance.

5. REFERENCES

Input Message
VER:LVFILE

SEE PROPRIETARY NOTICE ON COVER PAGE

CCIS2WRE Field Enhancements in Recent Change (RC) Feature (403)



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CCIS2WRE Field Enhancements in Recent Change (RC) Feature (403)



1. Feature Description

1.01 Several Local Exchange Carrier (LEC) customers are currently replacing their 1A ESS™ switches connected to 4ESS™ switches with 5ESS® switches. During the replacement process, the customers have had to manually put all trunks in a disabled state, remove them, change the CCIS2WRE field, add the trunks back, and activate them. This process is time-consuming, error-prone, and cumbersome.

1.02 The CCIS2WRE Field Enhancement in RC feature makes it possible to change the CCIS2WRE field without disabling or removing the trunks. Only a single change to the CCIS2WRE characteristic has to be made for each Trunk Subgroup (TSG) being converted, and the PCIS bit in the Digital Interface Frame is initialized automatically.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Turn On/Turn Off Mechanism

7.01 This feature is turned on automatically by software deployment.

Ubiquity

7.02 Ubiquity of the release throughout the network is not required for the operation of this feature.

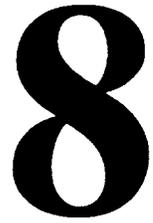
8. Input/Output Manual Pages (Not Affected)

**Feature Group-D Carrier
Identification Code Expansion
Cause Transparency Feature (405)**

8

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Feature Group-D Carrier Identification Code Expansion Cause Transparency Feature (405)



1. Feature Description

1.01 The Feature Group-D (FG-D) Carrier Identification Code (CIC) Expansion Cause Transparency feature changes the Integrated Services Digital Network User Part (ISUP) cause value sent by the 4ESS™ Access Tandem switch to the Local Exchange Carrier (LEC) end office if the expected number of digits is not received. This feature is an enhancement to Feature 161, *FG-D CIC Expansion*, which was released in 4E18, Release 1.

1.02 A call can fail because the number of digits received in the Transit Network Selection (TNS) parameter does not match the number of CIC digits allowed on the Trunk Subgroup (TSG). The specific causes of the failure are as follows:

- A 4-digit CIC is received and the incoming TSG only allows 3 digits
- A 3-digit CIC is received and the incoming TSG only allows 4 digits.

1.03 Currently, the cause value is 100. With the activation of this feature, the cause value will change to 91, **Invalid Transit Network Selection**.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

6.01 Final Handling Code (FHC) 1939 currently sends a RELEASE message with a cause of *Invalid Parameter Contents* (value 100). Once this feature is activated, FHC 1939 will send the RELEASE message *Invalid Transit Network Selection* (value 91). This modification is being made for both the Access Tandem and Toll switches.

7. Transition Considerations

Turn On/Turn Off Mechanism

7.01 This feature is turned on automatically by software deployment.

8. Input/Output Manual Pages (Not Affected)

10-Digit Global Title Translation (GTT) Support Feature (3917b)

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10-Digit Global Title Translation (GTT) Support Feature (3917b)

9

1. Feature Description

1.01 The Signaling Network Analysis System (SNAS) is used by various centers to detect and isolate problems in the signaling network. Some of the centers that rely on SNAS are the Network Operations Center (NOC), the National Electronic System Assistance Center (NESAC), the Common Channel Signaling (CCS) National Administration Center (CNAC), the Software Defined Network Control Center (SDNCC), and the Advanced Feature Service Center (AFSC). The SNAS performs its function by collecting and analyzing Call Irregularity Messages (CIMs) from switches throughout the network. When SNAS receives a CIM, it performs a table lookup on its Global Title Translation (GTT) to Network Control Point (NCP) application database to determine the point code and subsystem number of the NCP that was used to process the call. (The application database is a duplicate of the 2 Signal Transfer Point (2STP) 3-digit and 6-digit GTT table.)

1.02 This method of identifying an NCP worked fine as long as only 3-digit or 6-digit GTTs were used. Since not that many translation records had to be stored, maintaining a duplicate GTT database was no problem. For example, when SNAS was originally implemented, the application database contained less than 10,000 translation records. To support 10-digit GTT, however, SNAS would need to store more than 8 million records. Because costly hardware and software enhancements would be required to provide that amount of storage capability, it is no longer feasible for SNAS to maintain a duplicate GTT database.

1.03 This feature introduces a method for SNAS to determine the identity of the NCP application that was queried (point code and subsystem number) without having to support a duplicate database of GTTs. The 4ESS™ switch now records the point code and subsystem number in certain CIMs when a call irregularity occurs. This information is only recorded when a call irregularity occurs after global title translation is completed and before the routing command from the NCP is received at the 4ESS switch.

1.04 Because of the complexity of providing the NCP application identity for some final handling codes, this feature is being implemented in two phases. In Phase 1, which was implemented in the 4E17 Release 4 Generic, the identity of the NCP application was added to 16 call irregularities. In Phase 2, the NCP application identity is being added to 8 more call irregularities. The call irregularities (identified by the final handling code number) that have had the NCP identity added are as follows:

- 1613—A time-out occurred while processing a Transaction Capabilities Application Part (TCAP) Direct Services Dialing (DSD) call
- 1615—A TCAP message was returned by the Common Network Interface (CNI) software
- 1616—A Unit Data Service (UDS) message was received [TCAP Software Defined Network (SDN) or TCAP Advanced 800 (A800)]

⇒ NOTE:

If the UDS message was returned from the Signal Transfer Point (STP), the point code in the CIM is the point code of the STP. If the UDS message was returned from the Direct Link Node (DLN), the point code in the CIM can be either zero (no translations found) or the point code of the NCP that was obtained from the GTT database.

- 1624—An SDN call was controlled by a Software Defined Network (SDN)-Network Operations Center System (NOCS) initiated Automatic Call Gap (ACG)
- 1625—An SDN call was controlled by the receipt of an ACG from the database
- 1626—A "dialed no service" call was controlled by the receipt of an ACG from the database
- 1627—A "dialed number service" call was controlled by the receipt of an ACG from the database
- 1628—A "dialed number service" call was controlled by a DSD-NOCS initiated ACG.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

6.01 The dump code for the call irregularities modified by this feature now contains the NCP point code and subsystem number. Figure 9-1 shows where the NCP destination point code (DPC) and subsystem number (SSN) appear on a REPT:IAOFC output message.

```
REPT: IAOFC, TRAPN 32, IDB
ICT 73 SNDG CA 02 01T
DIG: 8002202921 CPDIG: 714
DPC: 254 25 4 3 SSN: 2
NPT: 0
FENPA: 714
FHCODE: 294, IFHCODE: 294, SVICT: 6, DSDCEXC: 0
08:44:45
12/15/93 09:24:36
```

Figure 9-1. Sample REPT:IAOFC Output Message with Point Code and Subsystem Number

7. Transition Considerations

Turn On/Turn Off Mechanism

7.01 This feature is turned on automatically by software deployment.

Ubiquity

7.02 It is not necessary for all 4ESS switches in the network to be running the 4E18 Release 2 Generic for this feature to be fully operational.

8. Input/Output Manual Pages

8.01 Two output manual pages were modified to support this feature: REPT:IAOFC and REPT:IATSG. The variables DPC (destination point code) and SSN (subsystem number) were added to these output messages.



NOTE:

Since these two manual pages were released with the 4E17 Release 4 Generic, copies of the manual pages are not included in this document.

Inbound 10-Digit Global Title Translation File Structure Expansion Feature (3949)

10

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Inbound 10-Digit Global Title Translation File Structure Expansion Feature (3949)

10

1. Feature Description

1.01 The Inbound 10-Digit Global Title Translation (GTT) File Structure Expansion feature is proprietary to AT&T. In 1993, the Inbound and Business Application Services Business Units activated the 10-digit GTT/Exchange Dependent Data functionality on the 4ESS™ switch. At that time, the 10-Digit GTT file structure was expanded to support 250,000 records and 3,072 unique Numbering Plan Area Number (NPA-NXX) combinations. In addition, the associated Point Code Subsystem routing information table was expanded to support 1,023 Point Code/Subsystem Number (PC/SSN) pairs. However, these requirements (covered in generic 4E17 Release 3, Feature 3899) only supported the short-term forecasts for Inbound Services.

1.02 To support the long-term forecasts for dialed digit numbers for Inbound Services in 4ESS switches, the 10-digit GTT file structure has been expanded to provide 500,000 records and a maximum of 7,000 unique NPA-NXX combinations. The PC/SSN table remains unchanged at 1,023 entries. The growth in the number of NPA-NXX and GTT entries requires expanding the file area that supports the tables.

2. Call Flow (Not Affected)

3. Provisioning

AT&T 3B20D Computer Disk Partitioning

3.01 Copies of the GTT files are divided into three equal sized partitions called ACTIVE, SHADOW, and SCRATCH. The ACTIVE partition contains the most current records. This is where all recent changes and data audits take place. The SHADOW partition contains a backup of the ACTIVE partition. The SCRATCH partition is used as a general purpose scratch area. Both the ACTIVE and the SHADOW partitions are divided into three segments, referred to as customer units. The three customer units are Inbound Global Title Translation (IBGTT), Outbound Global Title Translation (OBGTT), and Positive Call Processing Global Title Translation (PCPGTT). Activities on these customer units can take place concurrently and independently. This means that recent changes may be made concurrently to the IBGTT, OBGTT, and PCPGTT or audits or recent changes may be inhibited for the IBGTT without impacting the OBGTT or the PCPGTT.

3.02 The same data is contained in each IBGTT database in every 4ESS switch within the network. The off-line processor maintains this data to provide additional reliability in case of emergency. If a mishap occurs, the off-line processor can directly connect and download to all but four offices. Offices that can communicate directly to the off-line processor are referred to as "direct-connected" offices. When there is no direct communication between the office and the off-line processor, the office is called "non-connected."

File Structure Expansion

3.03 The file structure expansion is composed of the following procedures:

- Expansion Procedure
- File Verification
- General Expanded File Deployment Procedure.

3.04 Expansion of the IBGTT file structure occurs at each of the central offices where the current IBGTT data file is expanded to meet the new IBGTT requirements. This expanded file structure is then validated and tested to ensure the integrity of the file. Once the file has been validated, it will be deployed. Backout procedures are used when a mishap occurs while performing the file structure expansion procedures.

3.05 This feature provides two new tools for the file structure expansion. The first tool is a craft shell file expansion tool that is executed via the **VER:GTT:FEXP** command. This tool creates an expanded version of the IBGTT data file on the SCRATCH partition. The second tool is a craft shell verification tool that is executed via the **VER:GTT:CRCHK** command. This tool checks the integrity of the data file,

recomputing the Cyclic Redundancy Check (CRC) code values associated with the file and comparing these values with the stored CRC code values. This is done to ensure that the file has not been corrupted.

Entry Criteria

3.06 Generic 4E18 Release 2 software is the entry criteria for the file structure expansion procedure. This software accesses, audits, and performs recent changes on the small IBGTT data file in generic 4E17 Release 3 and the large (expanded) IBGTT data file in generic 4E18 Release 2. A version number that is embedded in the data structure indicates the size of the files. The different file types (small IBGTT and large IBGTT) may be resident at different times on the same disk or Direct Link Node (DLN) memory, yet both files can be used with generic 4E18 Release 2 software. A valid small IBGTT data file is also required.

Expansion Procedure

3.07 The procedures in Step A1 through Step A9 and Step B1 through Step B5 are performed to expand the IBGTT file structure. Steps A1 through Step A9 should be performed no earlier than 8:00 a.m. Switch Local Time (SLT) and no later than 9:00 p.m. SLT on the day of the file expansion. Notify Integrated Routing Assignment System (IRAS) Production Support and the appropriate Technical Control Centers (TCCs) to restrict Inbound 10-digit GTT recent changes before beginning the startup portion of the expansion procedure.

A. Startup

3.08 To prepare for file expansion, ensure that all recent changes, audits, and automatic backup capabilities on the IBGTT customer unit are inhibited. Also, make a backup copy of the ACTIVE file and validate the data on the backup copy (SHADOW partition) for use in case of a mishap. Perform the following steps for the "startup" procedure:

A1 Enter the following command to inhibit recent changes on the data file that is to be expanded:

INH:RCV:APPDB,APP IBGTT!

⇒ NOTE:

This command inhibits recent changes for the IBGTT customer unit only. The OBGTT and the PCPGTT customer units are not affected.

- A2 Wait to receive a message that indicates recent changes are inhibited before proceeding. The message could be OK, INHIBIT ALREADY ACTIVE, or RCV INHIBIT ACTIVE.
- A3 After ensuring that recent changes are inhibited, enter the following command to inhibit DLN audits on the IBGTT data file:
- INH:DLNAUD,APP IBGTT;AUD ALL!**

 **NOTE:**

This command inhibits audits for the IBGTT customer unit only.

- A4 After ensuring that audits are inhibited, enter the following command to inhibit the automatic backup capability:
- INH:ADB,APP IBGTT!**
- A5 Enter the following command to determine what data is stored in the IBGTT ACTIVE partition:
- VER:MEMORY,APP IBGTT:APPDB!**
- Save output for use in Steps A9 and B4.
- A6 Verify the validity of the ACTIVE file. (The file is valid if no errors or warnings are issued.) If the file is valid, proceed to Step A7. If the file is invalid, follow the standard procedure for restoring a valid copy to the ACTIVE partition. (That is, copy the SHADOW file to the ACTIVE partition.) After restoring a valid copy to the ACTIVE partition, follow the Backout Procedures, Part 1, and notify the IRAS Production Support to apply all recent changes performed after the date and time the SHADOW copy was made.
- A7 Enter the following command to copy the IBGTT data file from the ACTIVE disk partition to the SHADOW disk partition:
- COPY:APPDB,APP IBGTT; FROM ACT,TO SHADOW!**
- A8 Enter the following command to determine what data is stored in the IBGTT SHADOW partition:
- VER:MEMORY,SHADOW,APP IBGTT:APPDB!**
- Save the output for use in Steps A9, D31, and D34.
- A9 Compare the outputs received in Step A5 and Step A8. If they agree, proceed to Step B1. If they do not agree, repeat Step A5 through Step A8. If after a second time they still do not agree, seek technical assistance.

B. File Structure Expansion

3.09 The file structure expansion procedure has the following requirements:

- Create an empty skeleton data file.
- Expand the current file.
- Validate the newly expanded file.

3.10 Perform Step B1 through Step B5 for the file structure expansion procedure.

B1 Enter the following command to initialize a new file structure on the SCRATCH partition:

INIT:APPDB;SCRATCH!

B2 Enter the following command to expand the ACTIVE IBGTT file:

VER:GTT:FEXPN!

⇒ NOTE:

If unusual error messages are received during the expansion period, seek technical assistance. File expansion time is expected to take at least 1-1/2 hours but could take longer, depending on the amount of office activity.

B3 After being notified that the IBGTT memory has been expanded, enter the following command to determine what data is stored in the IBGTT SCRATCH partition:

VER:MEMORY,SCRATCH,APP IBGTT:APPDB!

Save the output for use in Step B4.

B4 Compare the outputs received in Step A5 and Step B3. If they agree, file structure expansion has been successfully completed. If they do not agree, repeat Step B1 through Step B3. If after a second time they still do not agree, seek technical assistance.

B5 Proceed to Step C1 for data file validation.

C. Validating Expanded IBGTT Data File

3.11 In accordance with the deployment schedule for generic 4E18 Release 2 expanded data file, perform Step C1 and Step C2 to validate the IBGTT data file.

C1 Enter the following command to ensure the integrity of the data file:

VER:GTT:CRCHK!

C2 If Step C1 is successful, the **VER:GTT:CRCHK** command will report back "CRC CHECK COMPLETED." Proceed to Step D1 for data file deployment. If the file does not pass the verification test, the **VER:GTT:CRCHK** command will issue

the report "CRC MISMATCH ON CLUMP #n," where n is the data in question. When this happens, repeat Step B1 through Step C1. If after a second time there still is a mismatch, seek technical assistance.

⇒ NOTE:

File integrity execution time may take up to 15 minutes, depending on the amount of office activity and data in the expanded file.

D. General Data File Deployment Procedure

3.12 The procedures for general data file deployment are contained in Step D1 through Step D38.

3.13 After verification, the expanded data file is classified as the master copy, placed on the ACTIVE partition, and downloaded to the standby DLNs. The standby DLNs with the new expanded data file are made ACTIVE. The integrity of the expanded file is then tested. If the test is successful, the deployment is considered complete, and the small IBGTT file is permanently replaced with the expanded file. If the test is not successful, refer to the Backout Procedures, Part 2 to restore the system to a stable condition. Perform Step D1 through Step D38 for general data file deployment.

D1 Obtain the new password (SID) from the National Electronic Switching Assistance Center (NESAC) in order to copy into the ACTIVE partition.

D2 Enter the following command to inhibit recent changes on all customer units:

INH:RCV:APPDB,APP ALL!

D3 Wait to receive a message indicating that recent changes are inhibited before proceeding. The message could be OK, INHIBIT ALREADY ACTIVE, or RCV INHIBIT ACTIVE.

D4 After ensuring that recent changes are inhibited, enter the following command to inhibit DLN audits for all customer units:

INH:DLNAUD,APP ALL;AUD ALL!

D5 Enter the following command to copy the expanded data file on the SCRATCH partition to the ACTIVE partition:

COPY:APPDB,SID *i*,APP IBGTT; FROM SCRATCH,TO ACT!

(where *i* = password)

D6 Identify the standby DLNs, the active inbound DLN, and the active outbound DLN from the 1107 display page on the 3B20D computer terminal.

D7 Enter the following command to remove the first standby DLN from service:

RMV:LN*a* *b*!

(where *a* = DLN group number and *b* = DLN member number)

D8 Enter the following command to remove the second standby DLN from service:

RMV:LN*c* *d*!

(where *c* = DLN group number and *d* = DLN member number)

D9 Enter the following command to restore the first standby DLN to service:

RST:LN*a* *b*!

(where *a* = DLN group number and *b* = DLN member number)

⇒ NOTE:

This command will force a pump of the data from the ACTIVE partition.

D10 Enter the following command to restore the second standby DLN to service:

RST:LN*c* *d*!

(where *c* = DLN group number and *d* = DLN member number)

⇒ NOTE:

This command will force a pump of the data from the ACTIVE partition.

D11 Wait for the DLNs to be restored.

D12 Enter the following command to switch the outbound DLN and one of the standby DLNs:

SW:DLN,LN*a* *b*,LN*e* *f*!

(where *a*, *e* = DLN group number and *b*, *f* = DLN member number)

D13 Enter the following command to switch the inbound DLN with the other standby DLN:

SW:DLN,LN*c* *d*,LN*g* *h*!

(where *c*, *g* = DLN group number and *d*, *h* = DLN member number)

D14 Enter the following command to reactivate recent changes on the PCPGTT file that had its recent changes inhibited:

ALW:RCV:APPDB,APP PCPGTT!

D15 Enter the following command to reactivate DLN audits on the PCPGTT file that had its audits inhibited:

ALW:DLNAUD,APP PCPGTT;AUD ALL!

- D16 Allow the DLN to soak to ensure that the load is stable. At the start of the soak period, notify the Network Operations Center (NOC) and the 4E NESAC that the soak has just begun so that they can set appropriate traps. If unusual error messages are received during the soak period, contact the TCC for assistance. Obtain confirmation from the NOC and 4E NESAC that the soak period is successful. If the soak period is successful, proceed with Step D17. If the soak period is not successful, refer to the Backout Procedures, Part 2.

⇒ NOTE:

If a DLN that contains the newly expanded file is switched with a nonexpanded DLN during the soak period, follow the Backout Procedures, Part 2 and repeat Step D2 through Step D16.

- D17 Enter the following command to inhibit recent changes on all customer units:
INH:RCV:APPDB,APP ALL!
- D18 Wait to receive a message that indicates recent changes are inhibited before proceeding. The message could be OK, INHIBIT ALREADY ACTIVE, or RCV INHIBIT ACTIVE.
- D19 After ensuring that recent changes are inhibited, enter the following command to inhibit DLN audits on all customer units:
INH:DLNAUD,APP ALL;AUD ALL!
- D20 Identify the standby DLNs, the active inbound DLN, and the active outbound DLN from the 1107 display page on the 3B20D computer terminal.
- D21 Enter the following command to remove the first standby DLN from service:
RMV:LN e f !
(where e = DLN group number and f = DLN member number)
- D22 Enter the following command to remove the second standby DLN from service:
RMV:LN g h !
(where g = DLN group number and h = DLN member number)
- D23 Enter the following command to restore the first standby DLN to service:
RST:LN e f !
(where e = DLN group number and f = DLN member number)

⇒ NOTE:

This command will force a pump of the data from the ACTIVE partition.

D24 Enter the following command to restore the second standby DLN to service:

RST:LN g h !

(where g = DLN group number and h = DLN member number)

⇒ NOTE:

This command will force a pump of the data from the ACTIVE partition. All DLNs now contain copies of the new expanded file.

D25 Enter the following command to reactivate recent changes on the PCPGTT file that had its recent changes inhibited:

ALW:RCV:APPDB,APP PCPGTT!

D26 Enter the following command to reactivate DLN audits on the PCPGTT file that had its audits inhibited:

ALW:DLNAUD,APP PCPGTT;AUD ALL!

D27 The first two or three offices that test the expanded IBGTT file will remain in the second soak mode for a full day at peak load to ensure system stability. The Inbound 10-digit GTT recent changes and audits will remain inhibited during that time. Obtain confirmation from the NOC and 4E NESAC that the load test period is successful. If the load test period is successful, proceed with Step D28. If the load test period is not successful, refer to the Backout Procedures, Part 2.

D28 Make a backup of the original IBGTT data (now in the SHADOW partition). This data will be lost when automatic backup is restarted. If the office is a "direct-connected" switch, proceed to Step D29. If the office is a "non-connected" switch, proceed to Step 32.

D29 Enter the following command to copy the small IBGTT data file from the SHADOW disk partition to the SCRATCH disk partition:

COPY:APPDB,APP IBGTT; FROM SHADOW,TO SCRATCH!

D30 Enter the following command to determine what data is stored in the IBGTT SCRATCH partition:

VER:MEMORY,SCRATCH,APP IBGTT:APPDB!

⇒ NOTE:

A copy of the small IBGTT data file is retained for additional security, in the event a mishap would occur after the completion of file expansion.

- D31 Compare the outputs received in Step D30 and Step A8. If they agree, proceed to Step D35. If they do not agree, repeat Step D29 and Step D30. If after a second time they still do not agree, seek technical assistance.
- D32 Mount the tape with a write-enable ring included on a 3B20D computer tape drive.
- D33 Enter the following command to copy the SHADOW partition file to tape:
COPY:APPDB,FROM "SHADOW", TO "/dev/mtx8"
(where $x = 0$ or 1)

⇒ NOTE:

When quote marks (" ") are used in commands, ensure that the commands are typed in the proper case. For example, "/dev/mtx8" must be lowercase, whereas "SHADOW", "SCRATCH", and "ACT" must be uppercase.

- D34 Remove the tape and write-enable ring from the drive and label it with the information obtained from the **VER:MEMORY** command in Step A8 as well as the time and date the tape was created. Proceed to Step D35.

⇒ NOTE:

A copy of the small IBGTT data file is retained for additional security, in the event a mishap would occur after the completion of file expansion.

- D35 Enter the following command to reactivate recent changes on the IBGTT file that had its recent changes inhibited:
ALW:RCV:APPDB,APP IBGTT!
- D36 Enter the following command to reactivate DLN audits on the IBGTT file that had its audits inhibited:
ALW:DLNAUD,APP IBGTT;AUD ALL!
- D37 Enter the following command to reactivate automatic backup:
ALW:ADB,APP IBGTT!
- D38 Notify IRAS Production Support, pager #816-995-3529, to unrestrict Inbound 10-digit GTT recent changes in this office.

Backout Procedures

3.14 The backout procedures are divided into two parts: Part 1 and Part 2. If at any time during the IBGTT file expansion deployment it is necessary to restore the system to a stable condition, perform the appropriate backout procedure. The backout procedures restore the office to a state that closely matches the state that existed before the start of the file expansion deployment.

A. Part 1

3.15 Part 1 of the backout procedures involves reactivating recent changes, DLN audits, and automatic backup capabilities on the IBGTT file. Perform the following steps for backout:

E1 Enter the following command to reactivate recent changes on the IBGTT file:

ALW:RCV:APPDB,APP IBGTT!

E2 Enter the following command to reactivate DLN audits on the IBGTT file:

ALW:DLNAUD,APP IBGTT;AUD ALL!

E3 Enter the following command to reactivate automatic backup:

ALW:ADB,APP IBGTT!

B. Part 2

3.16 Part 2 of the backout procedures involves inhibiting and reactivating recent changes, DLN audits, and automatic backup capabilities on the customer units. Part 2 also involves removing and restoring DLNs from and to service. Perform the following steps for backout:

F1 If the soak period was not successful, enter the following command to inhibit recent changes on all customer units:

INH:RCV:APPDB,APP ALL!

F2 Wait to receive a message that indicates recent changes are inhibited before proceeding. The message could be OK, INHIBIT ALREADY ACTIVE, or RCV INHIBIT ACTIVE.

F3 After ensuring that recent changes are inhibited, enter the following command to inhibit DLN audits for all customer units:

INH:DLNAUD,APP ALL;AUD ALL!

F4 Obtain the new password (SID) from NESAC in order to copy into the ACTIVE partition.

F5 Enter the following command to copy the backup small IBGTT data file on the SHADOW partition to the ACTIVE partition:

COPY:APPDB,SID *i*,APP IBGTT; FROM SHADOW,TO ACT!

(where *i* = password)

F6 Identify the standby DLNs, the active inbound DLN, and the active outbound DLN from the 1107 display page on the 3B20D computer terminal.

F7 Enter the following command to remove the first standby DLN from service:

RMV:LN*e f*!

(where *e* = DLN group number and *f* = DLN member number)

F8 Enter the following command to remove the second standby DLN from service:

RMV:LN*g h*!

(where *g* = DLN group number and *h* = DLN member number)

F9 Enter the following command to restore the first standby DLN to service:

RST:LN*e f*!

(where *e* = DLN group number and *f* = DLN member number)

⇒ NOTE:

This command will force a pump of the data from the ACTIVE partition.

F10 Enter the following command to restore the second standby DLN to service:

RST:LN*g h*!

(where *g* = DLN group number and *h* = DLN member number)

⇒ NOTE:

This command will force a pump of the data from the ACTIVE partition.

F11 Enter the following command to switch the outbound DLN and one of the standby DLNs that contains the small IBGTT data file:

SW:DLN,LN*a b*,LN*e f*!

(where *a*, *e* = DLN group number and *b*, *f* = DLN member number)

- F12 Enter the following command to switch the inbound DLN with the other standby DLN that contains the small IBGTT data file:

SW:DLN,LNc d,LNg h!

(where *c, g* = DLN group number and *d, h* = DLN member number)

- F13 Enter the following command to remove the first standby DLN from service:

RMV:LN a b!

(where *a* = DLN group number and *b* = DLN member number)

- F14 Enter the following command to remove the second standby DLN from service:

RMV:LN c d!

(where *c* = DLN group number and *d* = DLN member number)

- F15 Enter the following command to restore the first standby DLN to service:

RST:LN a b!

(where *a* = DLN group number and *b* = DLN member number)

⇒ NOTE:

This command will force a pump of the data from the ACTIVE partition.

- F16 Enter the following command to restore the second standby DLN to service:

RST:LN c d!

(where *c* = DLN group number and *d* = DLN member number)

⇒ NOTE:

This command will force a pump of the data from the ACTIVE partition and leave the system in its original state.

- F17 Enter the following command to reactivate recent changes on all customer units:

ALW:RCV:APPDB,APP ALL!

- F18 Enter the following command to reactivate DLN audits on all customer units:

ALW:DLNAUD,APP ALL;AUD ALL!

- F19 Enter the following command to reactivate automatic backup:

ALW:ADB,APP IBGTT!

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Turn On/Turn Off Mechanism

7.01 This feature is turned on automatically by software deployment. Ubiquity of the generic across the network is not required before the feature can be fully operational.

8. Input/Output Manual Pages

8.01 The following input/output messages have been created to support the Inbound 10-digit GTT file structure expansion. A copy of the manual pages is included at the end of this chapter.

- **VER:GTT:FEXP**N—expands the existing 4E17R3 file structure into the larger 4E18R2 file structure.
- **VER:GTT:CRCHK**—guarantees that no errors have corrupted the expanded data.

ID VER:GTT-FEXPN
WORK CENTER.. MOC, IRAS
GENERIC 4AP12 Rel. 2 and later
APPLICATION .. 4E
TYPE Input

1. PURPOSE

Expands the 10-Digit Inbound Global Title Translation (IBGTT) data file at the Off-Line switch.

2. FORMAT

VER:GTT:FEXPN!

3. EXPLANATION OF MESSAGE

The 4AP12 Release 1 data file supports up to one-quarter of a million dialed digit numbers. This command expands the IBGTT file located on the ACTIVE partition, /dev/appdb0, to a file which will support one-half million dialed digit numbers. This expanded file is copied to the SCRATCH partition, /dev/appdb2. All data records stored in the initial file (/dev/appdb0) are then copied to the expanded file on /dev/appdb2.

4. SYSTEM RESPONSE

PF Message accepted and VER:GTT-FEXPN output message follows.

5. REFERENCES

Input Messages

VER:GTT-CRCHK
VER:MEMORY

Output Messages

VER:GTT-CRCHK
VER:GTT-FEXPN
VER:MEMORY

SEE PROPRIETARY NOTICE ON COVER PAGE

ID VER:GTT-CRCHK
WORK CENTER.. MOC,IRAS
GENERIC 4AP12 Rel. 2 and later
APPLICATION .. 4E
TYPE Input

1. PURPOSE

Verifies the integrity of the 10 Digit Inbound Global Title Translation (IBGTT) database.

2. FORMAT

VER:GTT:CRCHK!

3. EXPLANATION OF MESSAGE

Calculates the CRCs associated with the IBGTT 10-Digit data file and compares these calculations with the stored CRC values. If the newly calculated CRCs do not agree with the stored values, the data file integrity has been compromised.

The IBGTT data file will be downloaded from an Off-Line switch to the On-Site switches in the field. This command will be used to verify that no transmission errors have occurred.

4. SYSTEM RESPONSE

PF Printout follows.

5. REFERENCES

Input Messages
VER:GTT-FEXPN
VER:MEMORY

Output Messages
VER:GTT-CRCHK
VER:GTT-FEXPN
VER:MEMORY

SEE PROPRIETARY NOTICE ON COVER PAGE

ID VER:GTT-FEXPN
WORK CENTER.. MOC,IRAS
GENERIC 4AP12 Rel. 2 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

- [1] VER:GTT FEXPN BEGINNING CMPN TABLE EXPANSION
- [2] VER:GTT FEXPN BEGINNING ANI TABLE EXPANSION
- [3] VER:GTT FEXPN BEGINNING NCP TABLE UPDATE
- [4] VER:GTT FEXPN CALCULATING IBGTT CRC
- [5] VER:GTT FEXPN FILE EXPANSION COMPLETED
- [6] VER:GTT FEXPN COULD NOT OPEN IBGTT ACTIVE DATABASE - errno is a
- [7] VER:GTT FEXPN COULD NOT OPEN IBGTT SCRATCH DATABASE - errno is a
- [8] VER:GTT FEXPN INVALID SWITCH - FILE EXPANSION TERMINATED
- [9] VER:GTT FEXPN SCRATCH FILE INITIALIZATION FAILED - errno is a
- [10] VER:GTT FEXPN CMPN TABLE EXPANSION FAILURE - errno is a
- [11] VER:GTT FEXPN ANI TABLE EXPANSION FAILURE - errno is a
- [12] VER:GTT FEXPN NCP TABLE UPDATE FAILURE - errno is a
- [13] IBGTT CRC ERROR - errno is a

2. REASON FOR OUTPUT

Print the results of expanding the IBGTT application data file.

3. VARIABLE FIELD DEFINITIONS

- a Error number:
 - 120 — The object already exists.
 - 123 — No records were found in the ANI table.
 - 124 — No records were found in the Compaction table.
 - 127 — No records were found in the NCP table.
 - 141 — Invalid file descriptor.

SEE PROPRIETARY NOTICE ON COVER PAGE

- 143 — Disk read error.
- 144 — Disk write error.
- 154 — The database has a corruption problem.
- 155 — The cache table is corrupt.
- 156 — The database has a bad magic number.
- 157 — Invalid database.
- 175 — Invalid database version.
- 178 — Accessed address is invalid.
- 197 — Invalid search on database.

4. ACTION TO BE TAKEN

Formats 1 through 5 indicate that the expansion is in progress or has completed successfully.

Formats 6 and 7 indicate that either the input file (ACTIVE partition) or the output file (SCRATCH partition) could not be opened for read and/or write access.

Format 8 indicates that an attempt has been made to execute the command at an On-Site switch in the field.

Formats 9 through 11 indicate an error in the expansion procedure of one of the IBGTT data stores.

Format 12 indicates an error with the CRC calculation of the expanded file.

5. REFERENCES

Input Messages

VER:GTT-CRCHK
VER:GTT-FEXPN
VER:MEMORY

Output Messages

VER:GTT-CRCHK
VER:MEMORY

SEE PROPRIETARY NOTICE ON COVER PAGE

ID VER:GTT-CRCHK
WORK CENTER.. MOC,IRAS
GENERIC 4AP12 Rel. 2 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

- [1] VER GTT CRCHK RETRIEVE IBGTT CRC
- [2] VER GTT CRCHK NUMBER OF UNITS CHECKED - a
- [3] VER GTT CRCHK FILE CRC CHECK COMPLETED
- [4] VER GTT CRCHK COULD NOT OPEN IBGTT SCRATCH DATABASE - errno is a
- [5] VER GTT CRCHK IBGTT GET CRC ERROR - error is a
- [6] VER GTT CRCHK IBGTT GET CLUMP ERROR - error is a
- [7] VER GTT CRCHK IBGTT CLUMP ERROR - error is a
- [8] VER GTT CRCHK CRC MISMATCH ON CLUMP NUMBER - clump is a

2. REASON FOR OUTPUT

Print the results of expanding the IBGTT application data file.

Formats 1 through 3 indicate that the CRC check is in progress or has completed successfully.

Format 4 indicates that the input file (SCRATCH partition) could not be opened for read and/or write access.

Formats 5 through 7 indicate an error in an attempt to access the expanded file data.

Format 8 indicates that a transmission error has occurred.

3. VARIABLE FIELD DEFINITIONS

- a Error number:
 - 141 — Invalid file descriptor.
 - 143 — Disk read error.
 - 144 — Disk write error.
 - 154 — The database has a corruption problem.
 - 155 — The cache table is corrupt.

SEE PROPRIETARY NOTICE ON COVER PAGE

4. ACTION TO BE TAKEN

If Format 4 prints, this indicates a system error such as insufficient file descriptors or lack of an input file. Check that the appropriate file exist and reboot the system. If the problem does not go away, seek technical assistance from NESAC.

If Formats 5 through 7 print, this indicates some problem in accessing or performing the CRC calculation. Seek technical assistance.

If Format 8 prints, this indicates that a transmission error has occurred and a request should be made for the Off-Line switch to retransmit the file.

5. REFERENCES

Input Messages

VER:GTT-CRCHK
VER:GTT-FEXP
VER:MEMORY

Output Messages

VER:GTT-FEXP
VER:MEMORY

SEE PROPRIETARY NOTICE ON COVER PAGE

**Business Long Distance Services
(BLDS) Call Disposition
Recording Feature (3991)**

11

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Business Long Distance Services (BLDS) Call Disposition Recording Feature (3991)

11

1. Feature Description

1.01 This feature causes the Call Disposition Module (317) to be added to originating Access Charge Verification (ACV) records or originating Automatic Message Accounting (AMA) records that contain an ACV module. Previously, ACV recording had only been available for switched-access calls on Local Carrier Connecting (LCC) Trunk Subgroups (TSGs). With this feature, ACV recording will also become available for nodal services/arrangements on Private Branch Exchange (PBX) and Single Trunk Customer (STC) TSGs.

1.02 By recording ACV data on customer TSGs, detailed service-specific information about the disposition of calls and attempts required to track the Call Completion Direct Measure of Qualities (DMQs) is now available. ACV data is needed for cost allocation and services, and for network planning. An estimate of the percentage of calls which fail to complete is also needed on a service-specific basis. The service-specific information is needed for both switched-access and direct-connect services. Information on attempts, as well as completed calls, and the reason why a call fails to complete is recorded.

2. Call Flow (Not Affected)

3. Provisioning

3.01 The ACV Sampling Index (SINDEX) must be set. The SINDEX value is specified per TSG. This value specifies the rate at which calls will be sampled for ACV.

Although legal SINDEXT values are blank, 0, 1, 2, 4, 8, 16, 32, and 64, the SINDEXT should be set to 32. Blank and 0 specify that no verification recording is done; otherwise, one call out of the number entered will be recorded.

3.02 This SINDEXT can be set using Recent Change (RC) or Office Data Assembler (ODA) forms. This feature works for PBX, STC, and LCC TSGs. An LCC TSG must have FENCLASS equal to ACCESSO.

Provisioning with Recent Change Forms

3.03 Use RC Form 100, 101, 102, 107, 108, or 109 to populate the SINDEXT treatment value in the XL4TS_SINDEXT structure. Use Verify Form 11d with these RC forms.

3.04 These forms are TSG RC forms that apply to a specific type of TSG. Only one of these forms is needed for a particular TSG. Table 11-A lists RC forms and their associated TSGs.

Table 11-A. Recent Change Forms

RC Form	Description
100	Add a new 2-way TSG
101	Add a new 1-way incoming TSG
102	Add a new 1-way outgoing TSG
107	Change a 2-way TSG
108	Change a 1-way incoming TSG
109	Change a 1-way outgoing TSG

Provisioning with Office Data Assembler Forms

3.05 Use ODA Form 401A, 401B, or 401C to populate the SINDEXT treatment value in the XL4TS_SINDEXT structure. Use Verify Form 11d with these ODA forms.

3.06 These forms are TSG ODA forms that apply to a specific type of TSG. Only one of these forms is needed for a particular TSG. Table 11-B lists ODA forms and their associated TSGs.

Table 11-B. ODA Forms

ODA Form	Description
401A	Two-way TSG characteristics
401B	One-way incoming TSG characteristics
401C	One-way outgoing TSG characteristics

4. Recording

4.01 This feature causes Call Disposition Module (317) to be added to the originating ACV records or originating AMA records that contain an ACV module.

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Turn On/Turn Off Mechanism

7.01 This feature is turned on automatically by software deployment. However, the SINDEX treatment value must be populated in the XL4TS_SINDEX structure for existing PBX and STC TSGs. The SINDEX must also be populated for new TSGs. Refer to "Provisioning" in this chapter.

8. Input/Output Manual Pages (Not Affected)

Self-Provisioning Global Title Translation (SPGTT) Feature (4032)

12

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Self-Provisioning Global Title Translation (SPGTT) Feature (4032)

12

1. Feature Description

1.01 The Self-Provisioning Global Title Translation (SPGTT) feature provides a fast and cost effective method of provisioning Software Defined Network (SDN) Global Title Translation (GTT) records in the 4ESS™ switch.

1.02 Normally, a 4ESS switch database is provisioned by a support system that determines what records a switch needs and manages the provisioning of records to that switch. Provisioning of SDN GTT records, however, will be done a different way. Instead of relying on a support system, provisioning of SDN GTT records will be done from a master database. Each 4ESS switch will query this database for the GTT records it needs based on actual calls that 4ESS switch is serving. After using the information retrieved from the master database to access the correct Direct Services-ANI-based (DSA)/Direct Services Dialing (DSD) Network Control Point (NCP), the 4ESS switch stores the information in an internal database in anticipation that it will soon be used again.

1.03 The master database used by the Self-Provisioning GTT feature is located in the Universal Global Translator (UGT) NCP. The UGT NCP contains a master copy of all the Business Long Distance Services (BLDS) Automatic Number Identification (ANI) ranges and their associated translations. The translation maps an ANI range to a customer identification (ID), primary and secondary point codes, and the subsystem number of the associated DSA/DSD NCPs. When a query is made to the UGT NCP, an individual ANI is mapped to its associated ANI range. The UGT NCP returns the ANI range and the information pertaining to that range. The UGT NCP is also responsible for informing the appropriate 4ESS switches when ANI translation data is deleted or modified in its database.

1.04 The Direct Link Nodes (DLNs) at each 4ESS switch contain a subset of the global title translation data contained in the UGT NCP. This subset is stored in a GTT table in the DLN. Like the UGT NCP, the DLN database maps an ANI range to a customer ID, primary and secondary point codes, and the subsystem number of the associated DSA/DSD NCPs. SDN calls coming into a 4ESS switch first search the DLN GTT table for a match. If a match is found, a query is made to the appropriate DSA/DSD NCP. However, if no match is found in the GTT table, a query is sent to the UGT NCP for translation. This information is sent back to the 4ESS switch which sends a query to the DSA/DSD NCP to retrieve the customer's call processing records. The information is also provisioned into the local GTT table for subsequent calls that match the same ANI range. The next time this customer places a call, the DLN GTT table will contain the translation data and no UGT NCP query is required. How this is accomplished will be explained in other sections of this chapter.

1.05 The UGT NCP will also do updates (deletes and customer moves) to the DLN GTT table in the 4ESS switches after the UGT NCP master record is updated by the Software Defined Network—Service Management System (SDN-SMS).

2. Call Flow

2.01 Two different SDN calling scenarios will be presented to describe how this feature works. The first scenario describes how a call is handled when an ANI (global title) match is found in the DLN GTT table. The second scenario describes how a call is handled when no ANI match is found in the DLN GTT table and a query has to be made to the UGT NCP.

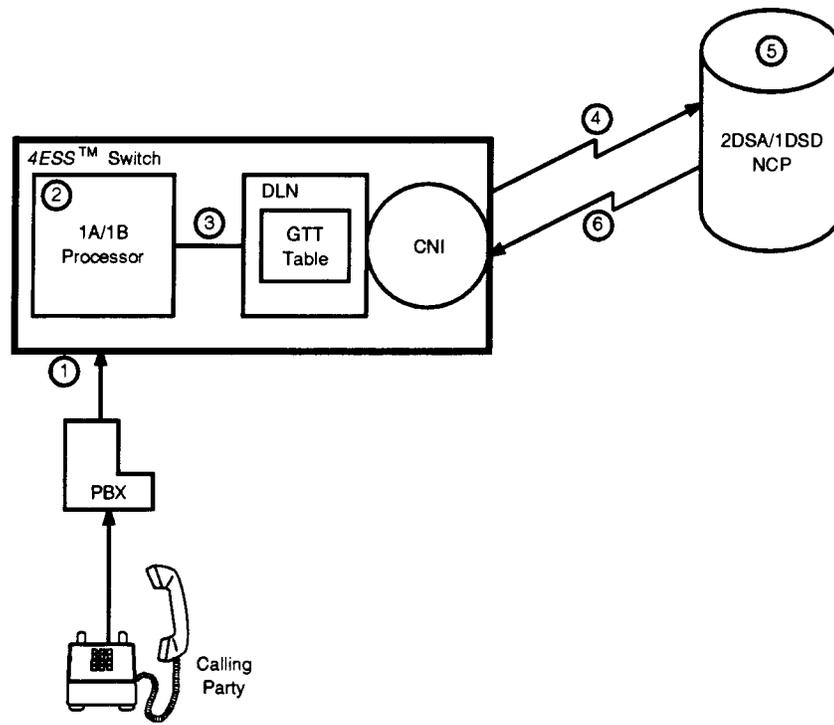
ANI Match Found in DLN GTT Table

2.02 The following text and Figure 12-1 describe the activities that take place for an SDN call when an ANI match is found in the GTT table in the DLN.

- 1 The 4ESS switch receives an SDN call that requires a database query.
- 2 The 1A/1B Processor creates a Transaction Capabilities Application Part (TCAP) message with a global title number in the Signaling Connection Control Part (SCCP) portion of the message.
- 3 The TCAP message is sent to the DLN, and an attempt is made to find a match for the global title in the GTT table.
- 4 A match is found for the global title, and a TCAP message is routed to the appropriate 2DSA/1DSD NCP.

- 5 The 2DSA/1DSD NCP searches its database for the Customer Record associated with the Customer ID contained in the TCAP message.
- 6 The Customer Record is found, the query is processed, and a response is returned to the 4ESS switch to complete the call.

⇒ NOTE:
 If a Customer Record is not found, either a Return Error-Missing Customer Record is returned or a Vacant Code function is executed.

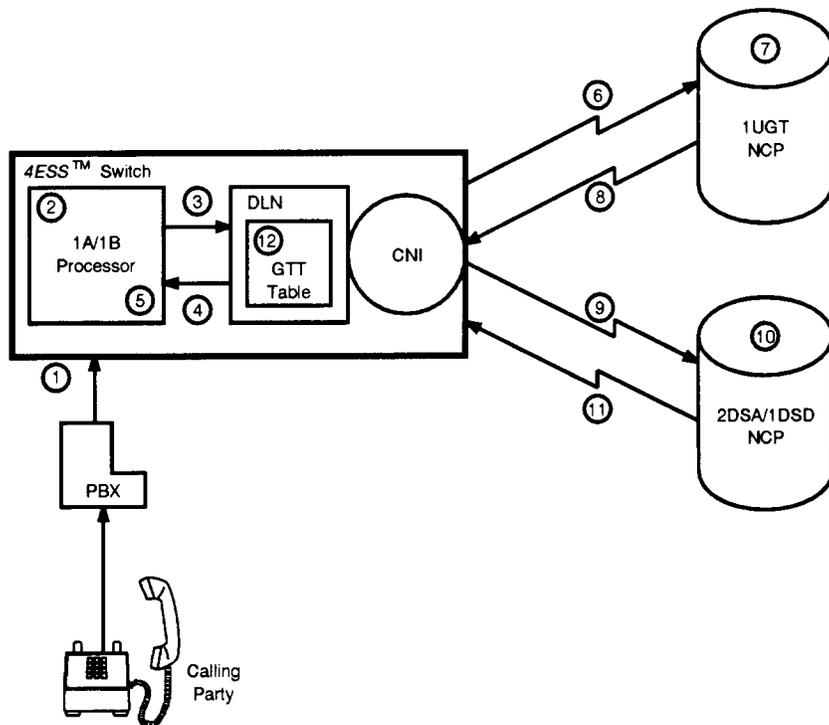


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Figure 12-1. SDN Call Flow—ANI Match Found in DLN GTT Table

ANI Match Not Found in DLN GTT Table

- 2.03** The following text and Figure 12-2 describe the activities that take place for an SDN call when no ANI match is found in the GTT table in the DLN.
- 1 The 4ESS switch receives an SDN call that requires a database query.
 - 2 The 1A/1B Processor creates a TCAP message with a global title number in the SCCP portion of the message.
 - 3 The TCAP message is sent to the DLN, and an attempt is made to find a match for the global title in the GTT table.
 - 4 No match is found so the TCAP message is returned by the DLN to the 1A/1B Processor.
 - 5 The 1A Processor creates a new TCAP message.
 - 6 The new TCAP message is Message Transfer Part (MTP) routed to the UGT NCP which contains all the valid SDN global titles.
 - 7 The UGT NCP searches its master database for the global title.
 - 8 A match is found, and the UGT NCP returns the following information to the 4ESS switch:
 - The full ANI range
 - The Point Code/Sub-System Number (PC/SSN) of the primary and secondary NCPs containing the Customer Record
 - The Customer ID.
 - 9 When the 4ESS switch receives the response, it MTP routes the original TCAP message to the 2DSA/1DSD NCP identified in Step 8.
 - 10 The 2DSA/1DSD NCP searches its database for the Customer Record associated with the incoming Customer ID.
 - 11 The Customer Record is found, the query is processed, and a response is returned to the 4ESS switch to complete the call.
 - 12 In addition to processing the call, the 4ESS switch adds the information received from the UGT NCP to the GTT table in the DLN.



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Figure 12-2. SDN Call Flow—No ANI Match Found in DLN GTT Table

2.04 With the information for the global title now in its DLN GTT table, it will not be necessary for the 4ESS switch to query the UGT NCP for any future calls with that global title.

3. Provisioning

3.01 All provisioning of SDN customer records is initially performed at the UGT NCP.

This section describes how provisioning changes made at the UGT NCP will be passed on to the DLN GTT tables at the 4ESS switches. Provisioning for the following situations will be described:

- adding entries to the DLN GTT table
- removing entries from the DLN GTT table
- changing the DLN GTT table when a customer is moved from one NCP pair to another NCP pair
- changing the DLN GTT table when mismatches occur between the NCP and the GTT table.

Adding Entries to DLN GTT Table

3.02 The only way of adding entries to the DLN GTT table is from the UGT NCP database. Additions are made when an ANI match is not found in the DLN GTT database. Paragraph 2.03 in the Call Processing section provides a general description of how this is accomplished. The following steps describe the process in more detail:

1. The UGT NCP receives a global title from the 1A Processor and determines the Customer ID, the total ANI range, and the PC/SSN of the NCPs for this global title.
2. The UGT NCP sends this information to the Home DLN which passes the information to the 1A Processor. The Home DLN also determines that the ANI range needs to be added to the GTT table in each DLN.
3. To start the process for adding the ANI range to the DLN GTT table, the Home DLN sends the information pertaining to the global title to the Outbound (OB) DLN.
4. When the OB DLN receives the information, it enters this information on a worklist. (The OB DLN also sends the information to the 3B Processor to be logged.)
5. The worklist in the OB DLN is serviced periodically and when this entry is reached, the job is dispensed to a routine which adds the entry to the DLN GTT table.
6. The information is also sent to other available DLNs, and the entries are added to the GTT tables on these DLNs.

Removing Entries from DLN GTT Table

3.03 When an ANI range is no longer served by AT&T, that ANI range needs to be removed from all the appropriate 4ESS switch GTT tables. The following steps describe how this is accomplished:

1. The first step is to delete the ANI range from the UGT NCP database via a recent change.
2. After the entry for the ANI range is deleted from the UGT NCP database, the UGT NCP determines which 4ESS switches also need to have this entry removed.
3. The UGT NCP sends a message to each of these switches.
4. The Home DLN at each switch receives the message and sends the message to the OB DLN.
5. As in the case of adding an entry, the OB DLN receives the message and enters the ANI range to be deleted on a worklist.
6. When the entry on the worklist is reached, the job is dispensed to a routine which deletes the ANI range from the DLN GTT table.
7. The information is also sent to other available DLNs, and the entries are deleted from the GTT tables on these DLNs.

⇒ NOTE:

To delete an ANI range from a DLN GTT table, the low end of the ANI range in the delete command must match the low end of the ANI range in the GTT table; the high end does not have to match. If the high end does not match, however, the ANI range that is deleted is not the range specified in the delete command, but the ANI range as it is defined (low end to high end) in the GTT table.

3.04 DLN GTT table entries can also be removed at the 4ESS switch using the RC:GTT command. This command allows you to remove an ANI range or to delete the entire database.

Changing a Customer's NCP Information

3.05 In order to balance the load, it sometimes becomes necessary to move customers from one NCP pair to another. The following steps describe how this is accomplished.

1. A recent change to move a customer from one NCP pair to another NCP pair is applied at the UGT NCP database.

2. After the change is made at the UGT NCP, the UGT NCP sends a message identifying the customer and the NCP pairs to all the 4ESS switches.
3. The Home DLN at each switch receives the message, determines that it is a customer move, and sends the message to the OB DLN.
4. As in the case of adding/deleting an entry, the OB DLN receives the message and enters the information pertaining to the customer move on a worklist.
5. When the entry on the worklist is reached, the job is dispensed to a routine which makes the change on the GTT table.
6. The customer move information is also sent to other available DLNs, and the customer moves are added to the GTT tables on these DLNs.

Correcting Mismatches Between DLN GTT Table and NCP

3.06 If a mismatch exists between the information in the GTT table in the 4ESS switch and the NCP, the customer record is removed from the DLN GTT table. The following steps describe how this is accomplished: (Also refer to the Call Processing section, "ANI Match Found in DLN GTT Table.")

1. The NCP receives a query from the 4ESS switch, but the ANI in the query is not found in the NCP database.
2. A TCAP END message is sent to the 4ESS switch indicating that the ANI is not served.
3. The Home DLN receives the message from the NCP, places it in 1A Processor format, and sends the message to the 1A Processor.
4. The 1A Processor queries the UGT NCP.
5. If the response from the UGT NCP is a missing customer record, the 1A Processor generates a delete message and sends it to the Home DLN.
6. The Home DLN sends the message to the OB DLN.
7. As in the case of deleting an entry, the OB DLN enters the customer record to be deleted on the worklist. A copy of the delete message is also sent to the 3B Processor.
8. When the entry on the worklist is reached, the job is dispensed to a routine which deletes the customer's record from the GTT table.
9. The information is also sent to other available DLNs, and the entries are added to the GTT tables on these DLNs.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

Call Irregularities

- 6.01** Final handling codes 1700 and 1702 are no longer generated whenever the UGT NCP is queried.

Measurements

- 6.02** The following measurements are collected to evaluate the performance of the DLN GTT table:
- Number of entries replaced in the DLN GTT table when the table is full
 - Number of matches (hits) on the DLN GTT table
 - Number of messages that overflow the DLN buffer and are sent to the 3B Processor.
- 6.03** Counts of these measurements will be available to Data Acquisition Reports and Integrated Communications System (DARICS) on an hourly basis. These counts are also available at the switch using the DUMP:SMEAS message.

System Integrity

- 6.04** A new command, INIT:GTT, has been created to clear and reinitialize the entire database, if necessary.

7. Transition Considerations

Turn On/Turn Off Mechanism

⇒ NOTE:

Do not turn this feature on until the 1A Processor, the 3B Processor, and the DLN have the new software loaded.

- 7.01** This feature is turned on using an RC:MISC message. To turn this feature on, enter the following command:

RC:MISC;FHT,FTA:GTT10C252,2,C,D,000001!

- 7.02** To turn this feature off, enter the following command:

RC:MISC;FHT,FTA:GTT10C252,2,C,D,000000!

Ubiquity

- 7.03** Ubiquity is not required in order to activate this feature.

8. Input/Output Manual Pages

8.01 Two new input and three new output messages have been created to support the Self-Provisioning GTT (SPGTT) feature. Several other input and output messages were modified. Tables 12-A and 12-B identify the input and output manual pages that were affected.

Table 12-A. Input Messages

Message	New/ Modified	Purpose
INIT:GTT	New	Deletes the entire GTT table in one DLN or all DLNs in the switch
RC:GTT	New	Used to delete entries in the DLN GTT table
RC:MISC;FHT,FTA	Modified	Starts a session to add, delete, or change data in the GTT table residing in the DLN
VER:GTT	Modified	Performs various verifies of the GTT database

Table 12-B. Output Messages

Message	New/ Modified	Purpose
RC GTT	New	Printed in response to an RC:GTT input message
REPT SPGTT	New	Reports errors related to the SPGTT feature
REPT SPGT-INIT	New	Printed after an initialization of the SPGTT database on the DLN
RC MISC-FHT-FTA	Modified	Printed in response to an RC:MISC input message
REPT DLNCM-STMFLT	Modified	Reports stream faults and DLN application errors
VER GTT	Modified	Provides diagnostic information on internal problems found in the GTT databases

WARNING
This message may be service-affecting.
See explanation at end of message.

ID INIT:GTT
WORK CENTER.. MOC
GENERIC 4AP12 Rel. 2 and later
APPLICATION .. 4E
TYPE Input

1. PURPOSE

Delete the entire GTT table in a single or all the DLNs, then purge the DLN process in the DLN for self provisioned GTT. This command is only supported for the Translation Type (TT) 252 - Self Provisioning GTT.

2. FORMAT

INIT:GTT [,RNA a] :TT b, All!

3. EXPLANATION OF MESSAGE

- a Ring Node address of the DLN to be flushed; valid entries are 0x0-0x3ff.
- b Translation Type; valid option is 252.

4. SYSTEM RESPONSE

PF Printout follows.

5. REFERENCES

Output Message
INIT-GTT

WARNING
Using of this command in the field may cause severe overload on the UGT NCP and loss of calls. Seek technical assistance before using this option.

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WARNING
This message may be service-affecting.
See explanation at end of message.

ID RC:GTT
WORK CENTER.. MOC
GENERIC 4AP12 Rel. 2 and later
APPLICATION .. 4E
TYPE Input

1. PURPOSE

Starts a process to delete entries in the 10 Digit Global Title Translations database residing in the DLN ONLY (CACHE). This message will not be accepted if another craft message affecting the contents of 10 Digit GTT is in progress.

2. FORMAT

RC:GTT:TT a, ORNU b,c,NUM {d|e|f|ALL},g!

3. EXPLANATION OF MESSAGE

The parameters given in the above format are defined as follows with helpful rules as to how they are to be used:

- a Translation Type; valid option only 252
- b Recent change order number
- c Database operation:
 - D Delete
- d A 14-digit number in the form of NPANXXLLLLHHHH where LLLL is the lower end of the range and HHHH is the higher end of the range.
- e A 10-digit number in the form of NPANXXLLLL where LLLL is the lower end of the range.
- f A 6-digit number in the form of NPANXX, delete all the ranges in the NPANXX.
- ALL** Delete the entire database.
- g Numbering plan type:
 - A Action point numbering (APN).
 - N North American numbering plan (NANP).

DEPENDENCIES AND RESTRICTIONS

The following reflects rules for 10D GTT recent change messages.

1. In order for a delete message for an ANI to work, the LLLL lower end of the range must match what is in the database, however, the higher end (HHHH) does not have to match. If the HHHH does not match, then all the ranges of the data within NPANXXLLLL and NPANXXHHHH will be deleted.

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2. If a delete message with ANI is sent to the switch with NPANXXLLLL and no HHHH value, then the switch will delete the entire range that starts with NPANXXLLLL.
3. If a delete message with ANI is sent to the switch with NPANXX , then all the ranges for that NPANXX will be deleted
4. Delete messages with ALL option should be restricted to the ENAC and the TCC/NESAC. Using this option on multiple switches at the same time can cause loss of service if the UGTT NCP cannot handle the signaling load. The NPT field is not needed with this parameter.

4. SYSTEM RESPONSE

PF Printout follows.

5. REFERENCES

Output Message
RC:GTT

WARNING

Using the ALL option in the field may cause severe overload on the UGT NCP and loss of calls. Seek technical assistance before using this option.

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ID RC:MISC-FHT-FTA
WORK CENTER.. MOC
GENERIC 4AP12 Rel. 2 and later
APPLICATION .. 4E
TYPE Input

1. PURPOSE

Starts a session to add, delete, or change data in the 10-Digit Global Title Translations database residing in the DLN with the data given in this input message. This message will not be accepted if another message affecting the contents of 10-Digit GTT is in progress.

2. FORMAT

This message has two formats.

- [1] **RC:MISC;FHT,FTA: a,b,c,d,NUM (e,f,SSNNNNMMXXXX,ssnnnnmmxxxx,{g})!**
- [2] **RC:MISC;FHT,FTA: a,b,c,d,NUM (e,F,f,SSNNNNMMXXXX,ssnggghhxxxx,{g})!**

Format 1 describes the way in which data can be represented in the input message for the add and delete options.

Format 2 describes the way in which data can be represented in the input message for the change option.

3. EXPLANATION OF MESSAGE

The parameters given in the above format are defined as follows with helpful rules as to how they are to be used:

- a Translation capability and type:
- GTT10D253 — When inputting 800 or 900 Service NANP ANIs
 - GTT10D252 — Replaced by SPGT feature
 - GTT10D252APN — Replaced by SPGT feature
 - GTT10D242 — When inputting PCP Service NANP ANIs
 - GTT10D242APN — When inputting PCP Service APN ANIs
- b Recent change order number:

****** RULES ******

This is used to distinguish between RC taking place in the span of one day. It would be wise to use unique numbers for each RC entry.

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Restricted to nine characters. The first four characters must be alphanumeric, identifying the AT&T entity submitting the recent change. A list of mnemonics will be supplied for this four-character identifier later. The recent change convention for order number is given below:

submitting organization | order#

- c Database procedure:
A (ADD), D (DELETE), C(CHANGE)
- **** RULES ****
The first format mentioned is for add and delete. The second format mentioned is for change only.
- d Recent change processing flag. Only one option is allowed:
- L — List of reckeys.
- e Relation used for recent change:
- 1 — RC GT Record Key & NCP Subsystem.
 - 2 — Replaced by SPGT feature
 - 3 — Replaced by SPGT feature
 - 4 — Replaced by SPGT feature
- **** RULES ****
Relation #1 is independent of all others and must be used only with GTT10D242, GTT10D242APN, or GTT10D253.
- f Always 0.
- F Always 0.
- SSN Primary Subsystem Number.
- NNNMMMXXX Primary Point Code.
- ssn Secondary Subsystem Number.
- nnnmmmxxx Secondary Point Code.
- CHANGE
- SSN New Primary/Secondary Subsystem Number.
- NNNMMMXXX New Primary Point Code.
- ssn Old Primary/Secondary Subsystem Number.
- nnnmmmxxx Old Primary Point Code.
- GGGHHHXXX New Secondary Point Code.
- ggghhhxxx Old Secondary Point Code.

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**** RULES ****

(Subsystem Number = 000-007,232-255)
(Point Code = 254000000 - 254317255)

g GT Record Key (npanxxxxxxxx).
Default GT Record Key (npa).

**** RULES ****

A maximum of 2 entries may be entered per message. For relation #3 this entry must be zero, and only one value is allowed for input (which is the zero). The Default GT Key entry is only used for GTT10D252 when one needs to create a translation for NPAs without actually storing line numbers.

DEPENDENCIES AND RESTRICTIONS

The following reflects rules for 10D GTT recent change messages.

FOR TT = 253

- * RCREL=1: Primary Key = GT Record Key
Update GT Record Key and NCP info.
- Customer ID is not applicable.
- Old NCP info must exist on change.
- New NCP info may or may not exist on change and add.
- NCP info must exist on delete.
- Record Key must not exist on add.
- Record Key must exist on delete and change.
- Old and new NCP must be different on change.
- Cannot split ranges on a change.

FOR TT = 242

- * RCREL=1: Primary Key = GT Record Key
Update GT Record Key and NCP info.
- Customer ID is not applicable.
- Old NCP info must exist on change.
- New NCP info may or may not exist on change and add.
- NCP info must exist on delete.
- Record Key must not exist on add.
- Record Key must exist on delete and change.
- Old and new NCP must be different on change.
- GT Record Key must be a three digit number.
- No ranges are supported.

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4. SYSTEM RESPONSE

PF Printout follows. See output message RC : MISC-FHT-FTA for details.

5. REFERENCES

Output Message
RC : MISC-FHT-FTA

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ID VER:GTT
WORK CENTER.. MOC
GENERIC 4AP12 Rel. 2 and later
APPLICATION .. 4E
TYPE Input

1. PURPOSE

This command performs various verifies of the global title translations (GTT) database. The database is contained in three disk files and in each direct link node (DLN). The verify can be performed on any of the three valid disk files or any DLN. The default disk file is the active disk file for all TTs except for 252 (SDN services), in which case the default disk file is the Outbound DLN memory copy. (For TT 252, all GTT data is kept in DLN memory. There is no data kept on disk.)

The three disk files containing the database are located at:

1. /dev/appdb0 - the active disk file
2. /dev/appdb1 - the backup disk file
3. /dev/appdb2 - the "scratch pad" disk file

The purpose of the GTT database is to determine the correct network database (network control point or NCP) that contains the information for the requested translation type (TT) and digits. The GTT database currently supports three TTs: 242 for PCP services, 252 for SDN services, and 253 for 800 and 900 services. Furthermore, TTs 242 and 252 are subdivided into numbering plan types (NPT) called action point numbering (APN) and North American numbering plan (NANP). This is done by using keyword APN or NANP. If the TT is specified as 253 then no NPT can exist on the command line.

The following formats provide various views of the GTT database.

Format 1 gives the feature on/off status for both 6-digit and 10-digit GTT. Both the 6 and 10-digit GTT features default to being turned off. The 1A recent change

RC:MISC;FHT,FTA:a, where a is

{GT6ACT252|GT6ACT253|GT10AC252|GT10AC253}, is used to turn on the features. This information comes from the ACI database, not the APPDB database. Thus, the SHADOW or SCRATCH keywords cannot be used in format 1. The ACI database is resident within the 1A file and in each DLN.

Format 2 gives the total number of customers (or entries) in the database for the specified translation type. If TT equals 242 or 252, then both APN and NANP spectrums are searched.

Formats 3 through 6 give the network database (NCP) point code and subsystem information for the specified translation type and 10 digits of the automatic number identification (ANI). The ANI will be the calling number for TTs 242 (PCP services) and 252 (SDN services) and the called number for TT 253 (800 and 900 services). The DEF field (digits 4-6 of the ANI) can be entered as a single DEF, a range of DEFs, or ALL. The GHIJ keyword (digits 7-10 of the ANI) can be entered as a single GHIJ value or a GHIJ range. If the DEF keyword is specified as a range or ALL, keyword GHIJ must not be included.

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Formats 3 through 6 rules for database searching are:

- If **TT** is 242 or 252 then **APN** or **NANP** may exist. If both are omitted, both **NANP** and **APN** spectrum data is output.
- If **TT** is 253 then **NANP** may or may not exist.
- If **ABC DEF** and **GHIJ** exist, then only 10-digit DB trees are searched.
- If **ABC** and **DEF** exist and **GHIJ** does not exist, then only 6-digit DB trees are searched.
- If **ABC** exists and **DEF** or **GHIJ** does not exist, then only 3-digit DB trees are searched.

Format 7 gives a count of all the customers and the network database (NCP) information for equipped database indexes (DBI). This information can be used to verify load balancing of the ANI(s) on network databases. The output given for each equipped DBI entry is the pointcode (PC) and subsystem number (SSN) of two mated network databases (NCPs), and the number of ANI(s) using this DBI. For the case where **TT** is equal to 242 or 252 the counts include both **APN** and **NANP** number spectrums.

Format 8 gives a listing of all ANI DIGIT combinations that use a specific **TT** and **DBI**. If the **TT** is 242 or 252, then both **APN** and **NANP** spectrums will be searched.

Format 9 gives a count of all the customers and the network database (NCP) information for equipped customer indexes (CUSTID). The output given for each equipped customer index is the DBI, point code (PC) and subsystem number (SSN) of two mated network databases (NCPs), and the number of ANI(s) using this customer index.

Format 10 gives a listing of all 10-DIGIT ANI combinations that use a specific customer index.

Format 11 terminates all running verify processes. This is helpful when the verify command is outputting too much information.

Format 12 maps the old **GTT** databases (prior to 4E17 Rel. 3) into the larger, restructured **GTT** database (4E17 Rel. 3 and later).

2. FORMAT

- [1] **VER:GTT [,RNA x] :STAT!**
- [2] **VER:GTT [,RNA x|SHADOW|SCRATCH] :TT {242|252|253},SUM!**
- [3] **VER:GTT [,RNA x|SHADOW|SCRATCH] :TT {242|252|253}[,APN|NANP],ABC a,DEF b,GHIJ d[-e]!**
- [4] **VER:GTT [,RNA x|SHADOW|SCRATCH] :TT {242|252|253}[,APN|NANP],ABC a,DEF b,GHIJ ALL!**
- [5] **VER:GTT [,RNA x|SHADOW] :TT {242|252|253}[,APN|NANP],ABC a,DEF b[-c]!**

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- [6] VER:GTT [,RNA x|SHADOW]:TT {242|252|253}[,APN|NANP],ABC a,
DEF ALL!
- [7] VER:GTT [,RNA x|SHADOW]:TT {242|252|253},DBI ALL!
- [8] VER:GTT [,RNA x|SHADOW]:TT {242|252|253},DBI f!
- [9] VER:GTT [,RNA x|SHADOW]:CUSTID ALL!
- [10] VER:GTT [,RNA x|SHADOW]:CUSTID g!
- [11] VER:GTT [,RNA x|SHADOW]:STOP!

3. EXPLANATION OF MESSAGE

- TT 242** Translation type 242 is used for Positive Call Processing (PCP) type services. The **ABC** values for this **TT** are normally the home NPAs that are supported at this 4ESSTM, unless the **APN** keyword is specified. If the **TT** is specified as 242, then either the **APN** or **NANP** keyword must be supplied. Only three digit GT translations are supported for **TT 242**.
- TT 252** Translation type 252 is used for SDN type services. The **ABC** values for this **TT** are normally the home NPAs that are supported at this 4ESSTM, unless the **APN** keyword is specified. If the **TT** is specified as 252, then either the **APN** or **NANP** keyword must be supplied.
- APN** This keyword is only valid when **TT** is specified as 242 or 252. Specification of **APN** restricts the verify search to the APN numbering plan.
- NANP** Specification of **NANP** restricts the verify search to the **NANP** numbering spectrum. **NANP** stands for North American Numbering Plan.
- TT 253** Translation type 253 is used for 800 and 900 type services. The **ABC** values for this **TT** are normally 195, 800, or 900. If **TT 253** is specified, then neither **APN** nor **NANP** must exist on the command line.
- a** This is the **ABC** value or first 3 digits of the requested global title number. For **TT** of 242 or 252, this is the dialing number; for **TT** of 253, this is the dialed number. The range of values for **ABC** is 0-999.
- b** This is the **DEF** value of the second 3 digits of the requested global title number. The range of values for **DEF** is 0-999. The **DEF** keyword is not supported for **TTs** of 242.
- c** The **DEF** field allows an optional range. If this value is entered, the value of **c** must be greater than the value of **b**. The range of values for **c** is 1-999.

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- d This is the **GHIJ** value of the last 4 digits of the requested 10-digit global title number. The range of values for **GHIJ** is 0-9999. The **GHIJ** keyword is not supported for **TTs** of 242.
- e The **GHIJ** field allows an optional range. If this value is entered, the value of **d** must be greater than the value of **e**. The range of values for **e** is 1-9999.
- f This is a specific database index (**DBI**). For the 242 and 252 translation types, there can be up to 256 **DBIs** (values 0-255), which store database point code and subsystem number information. For the 253 translation type, there can be up to 1024 **DBIs** (values 0-1023), which store database point code and subsystem number information.
- g This is a specific customer index (**CUSTID**). There are 9999 **CUSTIDs** (values 1-9999). Each **CUSTID** contains a **TT 252 DBI** index. **CUSTID 0** is not used.
- x This is the ring node address (**RNA**) of the direct link node (DLN) where the verify is to be done. If the **RNA x** entry is omitted, the default is to verify the active database file (/dev/appdb0) for all **TTs** other than 252. For 252, the default database copy is the copy kept in the Outbound DLN's core memory. The value of **x** can be entered in either hexadecimal (ex: X' 205) or in decimal (ex: 517). The range of **RNAs** are decimal 0-1023 (hex 0x0-0x3ff). The keyword **SHADOW** is used to verify the shadow (or backup database) located at /dev/appdb1. The keyword **SCRATCH** is used to verify the "scratch pad" database located at /dev/appdb2. Keywords **SHADOW** and **SCRATCH** are not allowed for **TT 252**.

4. SYSTEM RESPONSE

- PF VER-GTT output message will follow.
- RL Wait five minutes and retry command.

5. REFERENCES

Input Message

RC:MISC;FHT,FTA

Output Message

VER-GTT

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ID RC:GTT
WORK CENTER.. MOC
GENERIC 4AP12 Rel. 2 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

The following variations of the format given below describe the ways in which information can be represented in the output message.

- [1] RC GTT TT 252 ccccccccc COMPLETE
?I - COMMAND NOT RECOGNIZED
- [2] RC GTT TT 252 ccccccccc COMPLETE
RL - INTERNAL ERROR - ERRNO aaaa
- [3] RC GTT TT 252 ccccccccc COMPLETE
NG - INVALID DATA - b
- [4] RC GTT TT 252 ccccccccc COMPLETE
RC FOR ORDER ccccccccc COMPLETE UPD CODE ddd

2. REASON FOR OUTPUT

- [1] Message format is wrong, usually missing Keywords. Re-enter the message.
- [2] Retry Later. This is an internal error due to a failure in sending the delete request to the HOME DLN. and ERROR number will be printed to indicate where the failure happened
- [3] The format of the message is wrong, check the input message and retype the correct format. A string will be printed to indicate where the where is the failure.
- [4] The 3B successfully send the delete request to the DLN. The result of attempting to delete the entry from the database will be printed in ddd.

3. VARIABLE FIELD DEFINITIONS

aaaa DLNCM Failures:
15 — Failed to getport to DLNCM
16 — Failed to Find OUTBOUND DLN

Failure to OPEN IMS Channel:
-1 — Can't open because msg switch is down
-7 — Out of read queues to allocate
-8 — Out of old write queues to allocate
-103 — Maximum open channels

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- 104 — Bad function name in the argument
- 109 — Channel already open wait 2 minutes and retry

Failure to Set IMS Channel Controls:

- 3 — Not your channel.
- 6 — Out of read queues to allocate.
- 9 — No new message lists available.
- 17 — No block read lists available.
- 101 — Bad Channel number.
- 102 — Channel is closed.
- 106 — Could Not Make open request.

Failure to send Msg to DLN:

- 294 — Not enough space to satisfy the request.
- 299 — Can't open because msg switch is down.
- 247 — Chan number out of range.
- 198 — Channel is close.
- 199 — Bad Channel number.
- 296 — Bad length of the msg.
- 343 — Internal error, retry.

b

ANI
NPT
ORDER NO.
TT
OPERATION
HHHH less than LLLL
MISSING KEYWORD TT
MISSING KEYWORD ORNU
MISSING KEYWORD NUM
Order number.

cccccccc

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ddd

Supplementary data to indicate the result of attempting to delete the database:

- 0 — Successful Operation.
- 4 — Time-out waiting for the DLN to response.
- 101 — General database failure, unsuccessful completion.
- 102 — Database initialization in progress.
- 105 — Item to be modified was not located.
- 123 — The ANI being searched for was not found.
- 124 — Specified NPA-NXX combination was not found.
- 127 — Associated point code sub-system information does not exist.
- 141 — File descriptor is out of range.
- 143 — Error on reading from the database.
- 144 — Error on writing to the database.
- 154 — Database inconsistencies have been detected.
- 155 — Cache inconsistencies have been detected.
- 156 — The ADMINTOC or DBTOC magic number is invalid.
- 157 — Invalid database type for this application.
- 160 — Clump number is out of range for application.
- 178 — Database inconsistencies have been detected.
- 179 — Invalid input parameters detected at DLN.
- 180 — The ANI was not found.
- 181 — Invalid database address detected.
- 182 — Invalid database pointer detected.
- 183 — Invalid database range detected.
- 186 — Delete failed.
- 187 — Invalid database pointer detected.
- 188 — Invalid request detected at DLN.
- 190 — The application database value is invalid.
- 192 — The specified access mode is invalid.
- 193 — The specified customer identification number is invalid.
- 194 — The compaction table search chain exceeded maximum length.
- 195 — The ANI table search chain exceeded maximum.
- 196 — The DLN user buffer address is invalid.

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197 — Invalid table specified.

4. ACTION TO BE TAKEN

- [1] Check the format of the input message and enter the right format.
- [2] Wait few minutes, retry the message for a second time. If the problem persist, seek technical assistance.
- [3] Message format is not good, check the data and the format of the input message and re-enter it.
- [4] The code returned in the message will reflect the result of the data services attempting to delete the entry from the table. No action is needed for codes 0, 105 since they reflect normal operation. Any other code MAY reflect a problem with the data base, seek technical assistance.

5. REFERENCES

Input Messages
RC:GTT

Output Messages
RC:GTT

SEE PROPRIETARY NOTICE ON COVER PAGE

ID REPT:SPGTT
WORK CENTER.. MOC
GENERIC 4AP12 Rel. 3 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

- [1] REPT SPGTT d APspgtt() BAD MESSAGE LENGTH = a
- [2] REPT SPGTT d APspgtt() DLN CAN'T SEND MESSAGE TO OB DLN
- [3] REPT SPGTT d APspgtt() DLN SPGTT CAN'T SEND MESSAGE TO 3B
- [4] REPT SPGTT d APspgtt() DLN SPGTT CAN'T SEND MESSAGE TO SPG3B
- [5] REPT SPGTT d APspgtt() FEATURE NOT ACTIVE BUT RECEIVED m MSGS
- [6] REPT SPGTT d APspgtt() WLFAIL RETURNED index = b
- [7] REPT SPGTT d APspgtt() Worklist[] IS FULL
- [8] REPT SPGTT d CPerr()
ERROR NOT DSOBINIT WHILE DATABASE IS INITIALIZING
error en; fn; line ln
- [9] REPT SPGTT d CPerr()
INITIALIZE DATABASE DUE TO FLAG MISMATCH
error en; fn; line ln
- [10] REPT SPGTT d CPerr()
FLAG MISMATCH, Initflag was p, reset to DSNONINIT
error en; fn; line ln
- [11] REPT SPGTT d CPerr() SEV 1
error en; fn; line ln
TRAN [tr];
- [12] REPT SPGTT d CPerr() SEV 5
error en; fn; line ln
TRAN [tr];
- [13] REPT SPGTT d NFpspgtt() DLN SPGTT BAD RC. rrc = c rna = d
- [14] REPT SPGTT d NFpspgtt() DLN SPGTT CAN'T SEND MESSAGE TO SPG3B
- [15] REPT SPGTT d NFpspgtt() DLN SPGTT WRONG CHAN. chan = e
- [16] REPT SPGTT d NFpspgtt() IWLFULL RETURNED

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- [17] REPT SPGTT d NFpspgtt () PWLFULL RETURNED
- [18] REPT SPGTT d NFpspgtt () LENGTH TO LONG
- [19] REPT SPGTT d NFpspgtt () RCVED UNKNOWN MSG TYPE = f
- [20] REPT SPGTT d NFpspgtt () WAKEUP FAIL ERR: g
- [21] REPT SPGTT d NFpspgtt () WLFAIL RETURNED
- [22] REPT SPGTT d NFpspgtt () WLFULL RETURNED
- [23] REPT SPGTT d NFpspgtt () DLN SPGTT BAD RC. rrc = c rna = d
- [24] REPT SPGTT d NFpspgtt () DLN SPGTT CAN'T SEND MESSAGE TO SPG3B
- [25] REPT SPGTT d NFpspgtt () DLN SPGTT FEATURE NOT ACTIVE.
- [26] REPT SPGTT d NFpspgtt () DLN SPGTT WRONG CHAN. chan = e
- [27] REPT SPGTT d NFpspgtt () LENGTH TO LONG
- [28] REPT SPGTT d NFpspgtt () WAKEUP FAIL ERR: g
- [29] REPT SPGTT d NFpspgtt () WLFAIL RETURNED
- [30] REPT SPGTT d NFpspgtt () WLFULL RETURNED
- [31] REPT SPGTT d NFuspgtt () BAD ENTRIES SIZE = h
- [32] REPT SPGTT d NFuspgtt () DLN SPGTT BAD RC. rrc = c rna = d
- [33] REPT SPGTT d NFuspgtt () DLN SPGTT FEATURE NOT ACTIVE
- [34] REPT SPGTT d NFuspgtt () DLN SPGTT ON OB CALLED
- [35] REPT SPGTT d NFuspgtt () DLN SPGTT WRONG CHAN. chan = e
- [36] REPT SPGTT d NFuspgtt () IWLFAIL RETURNED
- [37] REPT SPGTT d NFuspgtt () IWLFULL RETURNED
- [38] REPT SPGTT d NFuspgtt () LENGTH TO LONG
- [39] REPT SPGTT d NFuspgtt () RCVED UNKNOWN MSG TYPE = f
- [40] REPT SPGTT d NFuspgtt () WAKEUP FAIL ERR: g
- [41] REPT SPGTT d NFuspgtt () WLFAIL RETURNED

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- [42] REPT SPGTT d NFuspgtt() WLFULL RETURNED
- [43] REPT SPGTT d NFvspggtt() BAD CHANNEL (e)
- [44] REPT SPGTT d SPdel() BAD ENTRIES SIZE = h
- [45] REPT SPGTT d SPdel() FAILED RC = c
- [46] REPT SPGTT d sp_enqueue_bckt() INVALID DISTANCE BETWEEN POINTERS, INIT BUCKET
- [47] REPT SPGTT d sp_enqueue_bckt() ARRAY ELEMENT NOT CLEARED, INIT BUCKET
- [48] REPT SPGTT d SPerr() SEV 1
error en; fn; line ln
TRAN [tr];
- [49] REPT SPGTT d SPerr() SEV 3; DIST dd; DELTA ttttttt; esc
error en; fn; line ln
TRAN [tr];
- [50] REPT SPGTT d SPerr() SEV 5
error en; fn; line ln
TRAN [tr];
- [51] REPT SPGTT d SPerr() SEV 5
DATABASE INIT FAILED DURING SPFLUSH
code = en; dsinit = q
- [52] REPT SPGTT d SPerr() SEV 5
DATABASE INIT FAILED DURING SPINIT
code = en; dsinit = q
- [53] REPT SPGTT d SPerr() SEV 5; SYSTEM ERROR
- [54] REPT SPGTT d SPerr() SPGINIT TIMER FAILED, ret code = g
- [55] REPT SPGTT d - SPflush() CAN'T SEND MSG TO 3B. RC = c
- [56] REPT SPGTT d sp_init_bckt()
SP_ERRORS_BCKT VALUE WAS TOO LOW, SPerrbckt is set to r
- [57] REPT SPGTT d sp_init_bckt()
SP_ERRORS_BCKT VALUE WAS TOO HIGH, SPerrbckt is set to r
- [58] REPT SPGTT d SPmain() AUDIT TIMER FAILED. rc = i
- [59] REPT SPGTT d SPmain() BAD j QUEUE CNT = k
- [60] REPT SPGTT d SPmain() CAN'T SEND MSG TO 3B. RC = c

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- [61] REPT SPGTT d SPmain() DID DS_flush. rc = en
- [62] REPT SPGTT d SPmain() DLN CAN'T SEND INITS TO DLNS
- [63] REPT SPGTT d SPmain() HAS A BAD PWORKLIST TYPE = 1
- [64] REPT SPGTT d SPmain() j MSG WAS PREVIOUSLY PROCESSED. ABrna = d
- [65] REPT SPGTT d SPmain() WAKEUP FAIL ERR: g
- [66] REPT SPGTT d SPrelease() BAD j QUEUE CNT = k
- [67] REPT SPGTT d SPrelease() FAILED 3B SEND RC = c
- [68] REPT SPGTT d SPpostmortem() FAILED 3B SEND RC = c
- [69] REPT SPGTT d SPs_run() FAILED RC = en
- [70] REPT SPGTT d SPs_upd() DLN CAN'T SEND MESSAGE TO OB DLN

2. REASON FOR OUTPUT

Prints errors in connection with the SPGTT Feature.

3. VARIABLE FIELD DEFINITIONS

- a Out of range length of internal SPGTT message.
- b Index of worklist entry in error.
- c Return code of IMS transport mechanism.
- d Ring node address (RNA) of direct link node (DLN) originating the error.
- e IMS Channel unexpected message received on.
- f Value of unexpected message type.
- g OSDS failure code.
- h Out of range value of number of entries.
- i Error value of OS audit return.
- j Worklist type:
 - IWORKLIST
 - PWORKLIST
 - WORKLIST
- k Value of invalid queue count.
- l Value of unexpected queue entry type.

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m	Number of messages received for the inactive feature since last reported.
p	Value of the initflag.
q	Value of dsinit global variable.
r	Value of SPerrbckt global variable.
dd	Distance between the load and unload pointers in the leaky bucket, the delta will be checked when the distance is at the error limit.
tttttttt	Time between the load and unload pointers (distance) in the leaky bucket in milliseconds. None is printed when no time check is made.
esc	ESC is printed when escalation will occur.
fn	File name where error was detected
ln	Line number where error was detected
en	Error number: 102 — SPGTT Database undergoing initialization. 105 — Item to be modified was not located. 111 — Cannot add number, 10-digit compaction table full. 114 — Cannot add number, customer ID table full. 116 — Cannot add point code sub-system information, NCP table full. 124 — Specified NPA-NXX combination was not found. 127 — Associated point code sub-system information does not exist. 154 — Database inconsistencies have been detected. 156 — The ADMINOC or DBTOC magic number is invalid. 178 — Invalid address. 179 — Invalid parameters. 180 — Specified entry not found. 181 — Binary search of AVL tree exceeds expected maximum length. 182 — Unexpected AVL head entry. 183 — Unexpected low range value found. 185 — Entry to add does not match low range of stored entry. 186 — Entry to delete does not match any stored entries. 187 — Invalid pointer to AVL record from customer ID entry. 190 — The application database value is invalid. 194 — The compaction table search chain exceeded maximum length. 197 — Invalid table specified.

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tr Transaction type being performed when error was detected.

This field can be null or may contain one of the following:
DELANIRNG; ANI npt npanxx; RANGE 1111-hhhh
MOVCUSTMR; CUST xxxx
ADDRECRD; CUST xxxx; ANI npt npanxx; RANGE 1111-hhhh
SPHOUR24; ANI npt npanxx; RANGE 1111-hhhh

Where the preceding variables are defined as:
npt — Numbering plan type.
npanxx — First six digits of the number.
1111 — The low line number of the range.
hhhh — The high line number of the range.
xxxx — The last four digits of the customer ID.

4. ACTION TO BE TAKEN

For errors:

```
[11] REPT SPGTT d CPerr() SEV 3
      error en; fn; line ln
      TRAN [tr];
```

```
[49] REPT SPGTT d SPerr() SEV 3; DIST dd; DELTA tttttt; esc
      error en; fn; line ln
      TRAN [tr];
```

with a value of [tr] being either DELANIRNG or ADDRECRD determine the npt and npanxx from [tr].

Perform a verify on that number using the input command VER:GTT with the following options:

- RNA as specified in d of the REPT message
- Translation type: 252
- Numbering plan type: npt from [tr].
- ABC: npa from [tr]
- DEF: nxx from [tr]
- GHIJ: 1111 from [tr]

Remove that npt/npanxx using the input command RC:GTT with the following options:

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- Translation type: 252
- Database Operation: D
- Digit number: npanxx from [tr]. Only six digits are to be entered.
- Numbering plan type: npt from [tr].

For error:

```
[48] REPT SPGTT d SPerr() SEV 1
      error en; fn; line ln
      TRAN [tr];
```

notify the National Electronic Switching Assistance Center (NESAC) to inform the CDID workcenter of a table resource exhaust.

If repeated errors indicate problems, seek technical assistance.

5. REFERENCES

None.

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ID REPT:SPGT-INIT
WORK CENTER.. MOC
GENERIC 4AP12 Rel. 2 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

[1] REPT SPGT INIT DUMP DLN AP a.

SPGT ADMINTOC INFO

MAGIC TRANS_CNT U_FLAG C_HITS REPLACEMENTS
bbbbbbbb cccccccc dddddddd eeeee ffffffff

LAST CREATE TIME: g

SPGT ADMINTOC TABLE INFO

TABLE START_ADR ENTRIES_USED

hhhh kkkkkk mmmmmmmmm
hhhh kkkkkk mmmmmmmmm

.
. .
. .

SPGT WORKLIST INFO

NAME COUNT PUT_MARK TAKE_MARK
n pppppp qqqqqq rrrrrr

.
. .

SPGT FAULT BUCKET INFO

DELANIRG MOVCUSTR ADDRECRD SPHOUR24 CPQUERY OTHER
sssss sssss sssss sssss sssss sssss

SPGT FAULT BUCKET INFO

IDX TIME ERRNO TRAN TYP DATA

tt uuuuuuuu vvvv ADDRECRD CUST www ANI x
tt uuuuuuuu vvvv DELANIRG ANI x
tt uuuuuuuu vvvv SPHOUR24 ANI x
tt uuuuuuuu vvvv MOVCUSTR CUST www
tt uuuuuuuu vvvv YYYYYYYY

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2. REASON FOR OUTPUT

This output message occurs after an initialization of the SPGT database on the DLN.

3. VARIABLE FIELD DEFINITIONS

a	Form of LNxx yy where xx is the group and yy is the member of a Direct link node (DLN) where the SPGT INIT occurred.
bbbbbbbb	Magic number of the SPGTT database.
cccccccc	The number of transactions since the previous initialization of the SPGTT database.
dddddddd	Use flag. If set to zero then database not running.
eeeeee	The number of records found since the previous initialization of the SPGTT database.
fffffff	The number of records replaced since the previous initialization of the SPGTT database.
g	Time since last initialize in the form of x HRS, x MINS, x SECS AGO.
hhhh	The name of the customer unit table that the data on this output line applies to. Each customer unit is broken into a number of data tables. The following is a list of the possible data tables that a customer unit can have. Not all customer units have the same number or combination of tables. ANI — Signifies the ANI data table. CUSTID — Signifies the customer ID data table. EPOCH — Signifies the Epoch data table. HEAD — Signifies the Head data table. NCP — Signifies the NCP routine data table. NPA NXX — Signifies the NPANXX "compression" table. PM AREA — Signifies the data table that holds the additional postmortem data. A line of data per customer unit table is output.
kkkkkk	Is the starting address of this data table in absolute memory address on the DLN.
mmmmmmmm	Is the total number of record "slots" used by this table.
n	Worklist type: blank (Worklist), "P" priority, "I" immediate.
pppppp	Number or items outstanding on that worklist.
qqqqqq	Load pointer of worklist.

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rrrrrr	Unload pointer of worklist.
sssss	Number of errors since last initialization for each type of transaction.
tt	Index into the leaky bucket for fault escalation.
uuuuuuuu	Time that the error took place, in milliseconds past DLN bring up.
vvvv	Error number for this index into the bucket
www	The customer id for the transaction at this index in the bucket
x	Number associated with the transaction at this index in the bucket in the form NPT NPA NXX LLLL-HHHH.
yyyyyyyy	Transaction type being performed when the error took place DATA is different depending on what transaction was performed.

4. ACTION TO BE TAKEN

None.

5. REFERENCES

None.

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ID RC:MISC-FHT-FTA
WORK CENTER.. MOC
GENERIC 4AP12 Rel. 2 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

The following variations of the format given below describe the ways in which information can be represented in the output message.

For messages preceded by ?I (invalid) or RL (retry later) the output will be as follows:

Note: []'s are not included in error message.

[1] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbb COMPLETE
[ERROR MESSAGE]

where [ERROR MESSAGE] can be one of the following:

USER ERRORS:

- (1) ?I - MESSAGE FORMAT = RC:MISC;FHT,FTA
- (2) ?I - INVALID FUNCTION AND TT TYPE
- (3) ?I - THIS OPTION IS NOT SUPPORTED - Use RC:GTT
- (4) RL - ANOTHER RC or VER IS ACTIVE
- (5) RL - INHIBIT ACTIVE

PROGRAM ERRORS:

- (1) RL - CAN'T ATTACH CNIPAS

For messages produced by invalid user syntax the output will be as follows:

[2] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbb IN PROGRESS
[ERROR MESSAGE]

[11] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbb COMPLETE
RC FOR ORDER bbbbbbbbb REJECTED

where [ERROR MESSAGE] can be one of the following:

- (1) NG - MUST SUPPLY AN ORDER NUMBER
- (2) NG - ORDER NUMBER LONGER THAN 9
- (3) NG - FIRST 4 CHARS OF ORDER# MUST BE ALPHABETIC
- (4) NG - MISSING DATA: COMMAND
- (5) NG - INVALID COMMAND
- (6) NG - ERROR ON COMMAND SPECIFICATION
- (7) NG - MISSING DATA: PROCESSING FLAG
- (8) NG - INVALID PROCESSING FLAG
- (9) NG - MISSING KEYWORD NUM

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- (10) NG - MISSING DATA: RC RELATION
- (11) NG - INVALID RC/VER RELATION
- (12) NG - MISSING DATA: PRIM SSN
- (13) NG - PRIM SSNPC CONTAINS LETTERS
- (14) NG - PRIM SSNPC NOT 12 BYTES
- (15) NG - PRIM SSN OUT OF RANGE
- (16) NG - PRIM PC OUT OF RANGE
- (17) NG - CNI UNROUTABLE FOR PRIM NCP INFO
- (18) NG - MISSING DATA: SEC SSNPC
- (19) NG - SEC SSNPC CONTAINS LETTERS
- (20) NG - SEC SSNPC NOT 12 BYTES
- (21) NG - SEC SSN OUT OF RANGE
- (22) NG - SEC PC OUT OF RANGE
- (23) NG - CNI UNROUTABLE FOR SEC NCP INFO
- (24) NG - RECKEY HAS INVALID LENGTH
- (25) NG - RECKEY MUST BE 10 OR 6 DIGITS FOR APN ANIs
- (26) NG - RECORD KEY CONTAINS LETTERS
- (27) NG - RECKEY MIXES LENGTH
- (28) NG - TOO MANY RECKEYS: MAX OF 10 ALLOWED
- (29) NG - INVALID RANGE SPECIFIED
- (30) NG - RECORD KEY MUST BE ZERO
- (31) NG - ONLY ONE RECORD KEY ALLOWED
- (32) NG - POINT CODE HAS INVALID NETWORK ID
- (33) NG - POINT CODE HAS INVALID CLUSTER ID
- (34) NG - POINT CODE HAS INVALID REGION
- (35) NG - POINT CODE HAS INVALID MEMBER
- (36) NG - NO ROUTING DATA EXISTS FOR POINT CODE
- (37) NG - CHANGE NOT ALLOWED WITH RELATION 4
- (38) NG - INVALID COMMAND
- (39) NG - INVALID DATA: OLD PRIMARY NCP
- (40) NG - INVALID DATA: OLD SECONDARY NCP
- (41) NG - INVALID DATA: PRIMARY NCP
- (42) NG - INVALID DATA: SECONDARY NCP
- (43) NG - INVALID OR MISSING ORDER NUM
- (44) NG - INVALID PROCESSING FLAG
- (45) NG - INVALID RANGE SPECIFIED
- (46) NG - INVALID RC/VER RELATION
- (47) NG - INVALID RECKEY cccccccccc
- (48) NG - INVALID RELATION
- (49) NG - MISSING DATA: COMMAND
- (50) NG - MISSING DATA: OLD PRIMARY NCP
- (51) NG - MISSING DATA: OLD SECONDARY NCP
- (52) NG - MISSING DATA: PRIMARY NCP
- (53) NG - MISSING DATA: PROCESSING FLAG
- (54) NG - MISSING DATA: RC RELATION
- (55) NG - MISSING DATA: SECONDARY NCP
- (56) NG - MISSING KEYWORD NUM
- (57) NG - ONLY ONE RECKEY ALLOWED
- (58) NG - RECKEY cccccccccc HAS INVALID LENGTH
- (59) NG - RECKEY MUST BE ZERO

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- (60) NG - RELATION 4 NOT USED FOR DELETE
- (61) NG - TOO MANY RECKEYS: MAX OF 2 ALLOWED
- (62) NG - TOO MANY RECORD KEYS SPECIFIED

For messages produced by errors while performing database searching or database actions (add, delete, change) before any data has been written to the database, the output will be as follows:

- [3] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb IN PROGRESS
[ERROR MESSAGE]
- [4] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb IN PROGRESS
ERR xxx yyy RECKEY cccccccccc
- [5] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb COMPLETE
RC FOR ORDER bbbbbbbbbb COMPLETE - DLN UNCHANGED

where [ERROR MESSAGE] can be one of the following:

USER ERRORS:

- (1) NG - ANIs EXIST IN THIS RANGE
- (2) NG - RANGE INVALID WHEN STARTED WITH LIST
- (3) NG - USER DATA DOES NOT REFLECT CHANGE
- (4) NG - NO CUST DATA FOUND
- (5) NG - NO NCP DATA FOUND
- (6) NG - CANNOT SPLIT RANGE ON CHANGE
- (7) NG - ANI DATA PREVIOUSLY EXISTS
- (8) NG - NO ANI DATA FOUND
- (9) NG - NO AVAILABLE NCP ENTRIES
- (10) NG - CUST DATA PREVIOUSLY EXISTS
- (11) NG - DATA PREVIOUSLY EXISTS
- (12) NG - ERROR ALLOCATING RECORD ENTRY
- (13) NG - NO ANI DATA FOUND
- (14) NG - NO AVAILABLE NCP ENTRIES
- (15) NG - NO NCP DATA FOUND
- (16) NG - OLD DATA DOES NOT MATCH

PROGRAM ERRORS:

- (1) DB - ERROR ACCESSING DATA TABLE
- (2) DB - ERROR ALLOCATING HEAD TABLE
- (3) DB - ERROR POPULATING DLN UPD ARRAY
- (4) DB - ERROR LSEEKING TO BINK ZERO
- (5) DB - ERROR READING BINK ZERO
- (6) DB - ERROR LSEEKING TO DATA TABLE
- (7) DB - ERROR ALLOCATING HEAD TABLE
- (8) DB - ERROR DEALLOCATING DATA TABLE
- (9) DB - ERROR WRITING BINK ZERO
- (10) DB - ERROR OPENING DATABASE
- (11) DB - ERROR CLOSING DATABASE
- (12) DB - ERROR WRITING DATA TABLE

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- (13) DB - ERROR SORTING DATA TABLE
- (14) DB - INVALID ANI TABLE POINTER
- (15) DB - ERROR SENDING RC MESSAGE TO ARTS
- (16) DB - ERROR GETTING ARTS PORT
- (17) DB - ERROR CREATING ROLLBACK FILE
- (18) DB - ERROR ALLOCATING RC STRUCTURE
- (19) DB - RC:MISC;FHT,FTA VERSION ERROR
- (20) DB - ERROR FORMATTING INTERNAL CMD
- (21) DB - ERROR CONNECTING TO RCV PROCESS
- (22) DB - ERROR WRITING TO RCV PROCESS
- (23) DB - ERROR READING RCV PROCESS
- (24) DB - ERROR DECODING INTERNAL RESPONSE

For messages produced by errors while performing database adding, deleting, or changing after data has been written to the database, the output will be as follows:

- [3] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb IN PROGRESS
[ERROR MESSAGE]
- [6] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb IN PROGRESS
ROLLING BACK DATABASE
- [7] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb IN PROGRESS
ORDER HAS BEEN ROLLED BACK
- [4] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb IN PROGRESS
ERR xxx yyy RECKEY cccccccccc
- [5] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb COMPLETE
DLN ERROR CODE = X'dddddddd

For messages produced by errors while performing database adding, deleting, or changing after data has been written to the database and the rollback function was not successful, the output will be as follows:

- [3] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb IN PROGRESS
[ERROR MESSAGE]
- [6] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb IN PROGRESS
ROLLING BACK DATABASE
- [8] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb IN PROGRESS
[ERROR MESSAGE1]
- [9] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb IN PROGRESS
DB-AUTOMATIC ROLLBACK FAILED
- [4] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb IN PROGRESS
ERR xxx yyy RECKEY cccccccccc

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[5] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb COMPLETE
DLN ERROR CODE = X'dddddddd

and where [ERROR MESSAGE1] can be one of the following:

PROGRAM ERRORS:

- (1) DB - ERROR UNLOCKING DATABASE
- (2) DB - ERROR OPENING ROLLBACK FILE
- (3) DB - ERROR CLOSING ROLLBACK FILE
- (4) DB - ROLLBACK FILE DOES NOT EXIST
- (5) DB - ERROR READING DATABASE
- (6) DB - ERROR WRITING DATABASE
- (7) DB - ERROR LSEEKING DATABASE

On a successful recent change the following output will be produced:

[10] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb COMPLETE
RC FOR ORDER bbbbbbbbbb COMPLETE UPD CODE = X'dddddddd

On a successful recent change, but the DLN is not updated, the following output will be produced:

[5] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb IN PROGRESS
DLN ERROR CODE = X'dddddddd

On a successful recent change, but catastrophic (i.e., a recent change causing all DLNs to be removed from service) errors resulted during DLN update, the following output will be produced for a four DLN office:

[12] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb IN PROGRESS
DLN ERROR CODE = X'44444444

or, for a two DLN office:

[12] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb IN PROGRESS
DLN ERROR CODE = X'44440707

In either case, the recent change causing this error message will be backed out (via rollback) and the "DLN Inhibit" trigger will be activated. This trigger will disallow any RCV activity (except VERIFYs) to the database until manual action (see ALW:RCV:APPDB) is taken to correct the trouble. The entire RC:MISC-FHT-FTA message will be echoed to the ROP.

For messages produced by errors while transferring RC requests from the switch I/O handlers to the RCV process handling RC requests, the output will be as follows:

[13] M S RC MISC FHT FTA GTT10Daaa bbbbbbbbbb COMPLETED
RC FOR ORDER bbbbbbbbbb ERROR sss (ttt)

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2. REASON FOR OUTPUT

To request the user to add, delete, verify, or change all record keys that are specified in the input message.

To verify the correctness of a message, acknowledge receipt of a message, to communicate with the user technician, and to perform the database routine specified in the message.

3. VARIABLE FIELD DEFINITIONS

aaa	Translation type: may have a value of 253 for 800 and 900 services, or 242 for PCPGTT. (aaa may also have APN appended if this was specified on the input message.)
bbbbbbbbbb	Order number: the first four characters signify where the RC originated; the last five characters signify a unique number for the recent change.
cccccccccc	Record key: indicates which record in the list or range was in error.
dddddddd	32-bit update code for DLNs which represents errors or success for 4 DLNs.

Each byte is a positive 7-bit update return code:

	0 — SUCCESS.
	1 — appdb pump in progress.
	2 — aci pump in progress.
	3 — aci update in progress.
	4 — dln is OOS.
	5 — no TCB resources for child task.
	6 — appdb update timeout (> 15 seconds).
	7 — dln is UNEQUIPPED.
	10 — Udlnappdb() failed to open the database.
	30 — _updappdb() # elements out of range.
	31 — _updappdb() dlnid out of range.
	32 — _updappdb() failed to send dln update start command.
	33 — _updappdb() bad dln response to update start command.
	34 — _updappdb() unable to Lseek() to appdb changed area.
	35 — _updappdb() unable to Read() to appdb changed area.
	36 — _updappdb() failed to send dln read start command.
	37 — _updappdb() bad dln response to read start command.
	38 — _updappdb() failed to send dln update complete command.
	39 — _updappdb() bad dln response to update complete command.
sss	Error number. See Minor Error Codes at the end of this message.
S	Number of seconds in current minute.
ttt	Error number. See Major Error Codes at the end of this message.
xxx	Error number. See Error Codes at the end of this message.

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YYY
 ADDING
 CHANGING
 DELETING

4. ACTION TO BE TAKEN

- Format 1: These are responses that are out of the user's control. The user should retry the message.
- Format 2: These are normal responses to format errors of the RC:MISC;FHT,FTA input message. The user should check the message typed on the screen against rules given in the input manual page.
- Formats 3, 6, 7, 8, and 9: These are error responses encountered from programs that are initiated by the recent change message. The user should check the correctness of the data entered in the message and the error code returned.
- Format 4: Error message with a code indicating recent change error.
- Format 5: Complete message on a failure.
- Format 10: Represents success. No action taken.
- Format 12: There was a problem with the DLNs.

5. REFERENCES

Input Messages

ALW:RCV:APPDB
CLR:DLNESC
INH:RCV:APPDB
OP:DLNESC
OP:INH:APPDB
RC:GTT
RC:MISC;FHT,FTA

Output Messages

ALW-RCV-APPDB
CLR-DLNESC
INH-RCV-APPDB
OP-DLNESC
OP-INH-APPDB
RC:GTT
REPT:INH-RCV-APPD

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Error Codes for GTT Data Applications

Error Codes for GTSEARCH (For 4AP11 Rel. 2 and earlier)

Errno	Definition
200	Invalid translation type on input
201	Invalid command specified from RC
202	Database is locked by another process
203	Invalid bink accessed by offset
204	Invalid popflag found in database
206	Could not find a space to search
207	Translator has not been equipped
208	Data already exists for an add
209	Data not exist for del, chg, or ver
210	Search was successful for data
211	Invalid bytes specified for widget

Error Codes for GTADD (For 4AP11 Rel. 2 and earlier)

Errno	Definition
220	NCP data does not exist
221	No slot to add data in SAPA or SAPC
222	Accessed invalid defflag for add level
223	Level is not valid for adding
224	Level is out of range 1 to 7
225	Invalid RC update relation
228	NCP data exists at NCP table
229	Cust record does not point to an NCP
230	Error accessing head tables
231	Error performing OST to DLN for updates
232	Error in the length of record key
233	DLN update array exceeded its boundary
234	Split of ranges not allowed for change
235	Cannot have one custid pointing to two NCPs
236	Flag to tell level 3 of sapa range function
237	Flag to tell level 3 of sapb range function

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Error Codes for GTROLLBK (For 4AP11 Rel. 2 and earlier)

Errno	Definition
240	Rollback file already created
241	Error accessing or writing rollback file
242	Rollback file is full of orders
243	No rollback file name supplied on input
244	Invalid number of orders on input
245	Not enough memory for rollback file

Error Codes for GTDEL (For 4AP11 Rel. 2 and earlier)

Errno	Definition
250	There was no DEF entry found for table
251	There was no populated entry in table

Error Codes for GTGETROLL (For 4AP11 Rel. 2 and earlier)

Errno	Definition
255	Order number not found in rollback file

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Error Codes for GTT Data Applications (For 4AP11 Rel. 3 and later)

Major Error Codes

Errno	Definition
4	Input parameter error
8	Improper SKO action requested
10	Record found
11	Record not found
14	Internal error failure
17	Database locked -- by manual action
23	Database locked - "DLN Inhibit" lock is set
24	Database locked -- already in use
25	SKO backed out
26	Backout failed for SKO
27	Improper key
29	Data error
31	Improper database specified

Minor Error Codes

Errno	Definition
101	Database service did not complete successfully.
105	Item to be modified was not located.
110	The 10-digit dialed number/ANI could not be added to the database because the hash table was full.
111	A 10-digit dialed number/ANI could not be added to the database because the 10-digit compaction table was full.
112	The EPAV table is full.
116	The point code sub-system information associated with the dialed digit/ANI could not be added to the database because the NCP table was full.
120	An object could not be added to the database because it already existed.
123	The dialed digit/ANI being searched for was not found.
124	The specified NPA-NXX combination was not found.
127	The point code sub-system information associated with the dialed digit/ANI does not exist.
130	The customer's EPAV chain length has reached maximum length.

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Error Codes for GTT Data Applications (continued) (For 4AP11 Rel. 3 and later)

Minor Error Codes

Errno	Definition
132	The EPAV customer's ANI record does not exist.
133	The EPAV customer has no EPAVs/subaccounts.
134	The EPAV-ANI exists, but the associated subaccount does not exist.
135	Neither the EPAV-ANI nor the associated subaccount exists.
141	File descriptor invalid.
143	An error occurred during an attempted database read.
144	An error occurred during an attempted database write.
154	Database inconsistencies have been detected.
155	Cached inconsistencies have been detected.
156	The ADMINTOC or DBTOC magic number in the specified database is invalid.
157	Invalid database type for this customer.
160	Clump number is out of range for specified customer.
176	All file descriptors are active, none available for assignment.
180	The NPA-NXX value that is to replace an existing value already exists in the database.
189	The number of subaccount digits to match on in request does not match stored digit count value.
190	The specified customer unit is invalid.
191	The specified user identification number is invalid.
192	The specified access mode was something other than read_only or read_write.
193	The specified customer identification number is invalid.
194	The compaction table search chain has exceeded maximum length.
195	The dialed digit/ANI table search chain has exceeded maximum length.
196	The DLN user buffer address is invalid.
201	The argument 'object' is invalid
202	The argument passed in is invalid
203	The instance does not exist
204	The instance cannot be created, since it existed already
205	End of object array, no more instance can be found or created
206	No free IR internal buffer
207	Request IMS buffer failed
208	Build IMS header failed
209	IMS write failed

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Error Codes for GTT Data Applications (continued) (For 4AP11 Rel. 3 and later)

Minor Error Codes

Errno	Definition
212	Data size + number of key > 480 bytes
213	Domain exceeds its buffer quota
215	Argument 'domain' is invalid
216	Get_BAD_CHAN failure from IMS read
217	Get_RTNMSG failure from IMS read
218	Get_SRCMATCH failure from IMS read
219	Bad message type
220	IR event length > 508 bytes
223	Wrong queue type
600	Old data supplied does not match database values
601	Improper customer unit specified by DS
602	SLT object not found and cannot be created
603	Buffer for writing to DLN full
604	Numbering plan type not APN or NANP
605	Invalid number in key portion
606	Invalid customer ID
608	Data missing on add, modify, or modify_ucl
609	Cannot backout a range
610	NPA NXX already exists on a split
650	Stuck in loop constantly deleting the same TR instance
651	Data from RC : MISC ; FHT , FTA too large for buffer, SUPPL is size of data
652	Did not read the expected amount of data from tmp file, SUPPL is the amount read
653	Data does not exist, SUPPL is the customer unit
654	Could not create TR instance, SUPPL is the IRerrno
655	Failure in populating MT and SKO instances
656	Failure to encode ASN message, SUPPL is the asn error string
657	No SLT instance exists
658	Customer database out of range
659	Error return from writing to DLNs
660	Could not create SLT instance, SUPPL is the IRerrno
661	Invalid file descriptor for DS
662	Invalid choice of SKO - internal data problems, SUPPL is the SKO type
663	An expected SKO does not exist
664	Could not create SKO instance, SUPPL is the IRerrno
665	Stuck in loop constantly deleting the same MT instance

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Error Codes for GTT Data Applications (continued) (For 4AP11 Rel. 3 and later)

Minor Error Codes

Errno	Definition
666	SKO instance in incorrect state - internal data failure, SUPPL is the state returned
667	DS file did not close
668	Could not create MT instance, SUPPL is the IRerrno
669	An expected MT instance does not exist
670	Could not create LOG instance, SUPPL is the IRerrno
671	Could not create SPLT instance, SUPPL is the IRerrno
672	Failure in populating SPLT instance
673	An expected MT instance does not exist
674	An expected ONEA instance does not exist.
675	Could not create ONEA instance, SUPPL is the IRerrno.

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ID REPT-DLNCM-STMFLT
WORK CENTER.. MOC
GENERIC 4AP12 Rel. 2 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

- [1] REPT DLNCM PROC (Strmfault): INV DEVICE a
- [2] REPT DLNCM PROC (Strmfault): INV API STRM ERR CODE b
- [3] REPT DLNCM PROC (Strmfault): INV DLN STRM ERR CODE b
- [4] REPT DLNCM PROC (Strmfault): [1A/API | LN x -y] STRM ERR
ABSORBED Strm Err:h
- [5] REPT DLNCM PROC (Strmfault): [1A/API | LN x -y] c
[Side: d Dir: e | X'f]
Level: g Strm Err: h
MFMUN: i-j-k

2. REASON FOR OUTPUT

To report stream faults and DLN application errors.

3. VARIABLE FIELD DEFINITIONS

- a Device number - Legal device numbers:
 - 0 — DLN0
 - 1 — DLN1
 - 2 — DLN2
 - 3 — DLN3
 - 4 — API
- b Unidentified error code.
- c Explanation of error:
 - 1A CLIENT REQ INIT
 - 1A PHASE OVER
 - 1A STRM INIT
 - BAD MSG
 - BAD PTR
 - BUF OVFL
 - CHAN ERR
 - DMA ERR

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EXCESSIVE ERRS RMV DLN
EXCESSIVE STRM FAULTS APDRV MAY ESCALATE
INTERNAL ERR
LOST 1A COMM
LOST STRM THROUGHPUT
MEM ERR
MSG REFORMAT ERR
NOT INCOMING DLN
OVL D COND
RING ERR
RST 1A COMM
SPGTT DATABASE INITING
STRM CRPT
TRANS ERR
UNK ERR

- d API, DLN, or BOTH.
- e 1AIN, 1AOUT, or BOTH.
- f DLN error code (see Output Appendix DLNCM-APP-1).
- g Severity level (0 - 10).
- h Stream error category (see Output Appendix DLNCM-APP-12).
- i Hexadecimal notation of the rna.
- j Hexadecimal notation of the number of errors since the device was last restored.
- k Hexadecimal notation of the number of error reports for this error.
- x DLN group number.
- y DLN member number.

4. ACTION TO BE TAKEN

For every stream fault there is an associated action with the same level and stream error. No corrective action is performed if the stream level is 0.

5. REFERENCES

Output Appendixes
DLNCM-APP-1
DLNCM-APP-12

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ID VER:GTT
WORK CENTER.. MOC
GENERIC 4AP12 Rel. 2 and later
APPLICATION .. 4E
TYPE Output

1. FORMAT

The following formats correspond to the input formats given in the VER:GTT input message. Formats 13-57 are error messages indicating possible corruption in the APPDB database.

[1] VER GTT a STAT COMPLETED
GT6TRAN253 b
GT6TRAN252 b
SPGT10TRAN b
GT10TRAN253 b
GTT10CNPA b
UGTTSNPA b

VER:COMPLETE MESSAGE:CODE 5,
1

[2] VER GTT a TT ccc SUM COMPLETED
GTTRANccc TOTAL # ENTRIES d
VER:COMPLETE MESSAGE:CODE 5,
1

[3] VER GTT a TT ccc mmm eee DEF fff GHIJ pppp i

DIGITS	NPT	TREE	CUST	PRIMARY	SECONDARY	
				SSN	PC	DBI
eeffffpppp	zzzz	ZZ	yyyy	ggg	hhhhhhhhh	ggg hhhhhhhh kkk
or						
eeffffpppp-eeffffpppp	zzzz	ZZ	yyyy	ggg	hhhhhhhhh	ggg hhhhhhhh kkk

1 to 18 lines of data per message

VER:COMPLETE MESSAGE:CODE 5,
j

[4] VER GTT a DBI ALL i

DBI	SSN	PC	SSN	PC	PRI/SEC
kkk	ggg	hhhhhhhhh	ggg	hhhhhhhhh	1111111

1-20 lines of data per message

VER:COMPLETE MESSAGE:CODE 5,

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j
[5] VER GTT a DBI kkk i

	PRIMARY		SECONDARY	
DBI	SSN	PC	SSN	PC
kkk	ggg	hhhhhhhhh	ggg	hhhhhhhhh
DIGITS		NPT TREE		
eeeffpppp		zzzz ZZ		
or				
eeeffpppp-eeeffpppp		zzzz ZZ		

1-17 lines of data per message

VER:COMPLETE MESSAGE:CODE 5,
j

[6] VER GTT a DBI kkk COMPLETED
DBI ROOT NOT ASSIGNED

VER:COMPLETE MESSAGE:CODE 5,
1

[7] VER GTT a DBI kkk COMPLETED
DBI NOT USED

VER:COMPLETE MESSAGE:CODE 5,
1

[8] VER GTT a CUSTID yyyy i

			PRIMARY		SECONDARY		
DIGITS	NPT	TREE	DBI	SSN	PC	SSN	PC
eeeffpppp	zzzz	ZZ	kkk	ggg	hhhhhhhhh	ggg	hhhhhhhhh
or							
eeeffpppp-eeeffpppp	zzzz	ZZ	kkk	ggg	hhhhhhhhh	ggg	hhhhhhhhh

1-18 lines of data per message

VER:COMPLETE MESSAGE:CODE 5,
j

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[9] VER GTT a CUSTID ALL i
CUSTID DBI SSN PC SSN PC PRI/SEC IDX
yyyy kkk ggg hhhhhhhh ggg hhhhhhhh 1111111 [Y]

1-20 lines of data per message

VER:COMPLETE MESSAGE:CODE 5,
j

[10] VER GTT a CUSTID yyyy COMPLETED
CUSTID NOT ASSIGNED

VER:COMPLETE MESSAGE:CODE 5,
l

[11] VER GTT MAP COMPLETED

VER:COMPLETE MESSAGE:CODE 5,
l

[12] VER GTT a DBI kkk COMPLETED
AVL TOO DEEP - NPANXX/NPT = eeefff/z
ani ani ani ani

.
. .
FILE=t, LINE=u

[13] VER GTT a DBI kkk COMPLETED
PULLED BAD ANI FROM STACK - ANI = ani
ani ani ani ani

.
. .
FILE=t, LINE=u

[14] VER GTT a DBI kkk COMPLETED
BAD ADMINTOC ADDR - X'xxxxxxxx
FILE=t, LINE=u

[15] VER GTT a DBI kkk COMPLETED
BAD ADMINTOC MAGIC - X'yyyyyyyy
FILE=t, LINE=u

[16] VER GTT a DBI kkk COMPLETED
BAD ANI ani in CID CHAIN yyyy (CID ADDR xxxxxxxx)
FILE=t, LINE=u

[17] VER GTT a DBI kkk COMPLETED
BAD BACK ani IN ANI RECORD ani (ANI ADDR xxxxxxxx), SHOULD BE ani

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FILE=t, LINE=u

- [18] VER GTT a DBI kkk COMPLETED
BAD CID yyyy IN ANI RECORD ani (ANI ADDR xxxxxxxx)
FILE=t, LINE=u
- [19] VER GTT a DBI kkk COMPLETED
BAD DBI REF kkk IN ANI RECORD ani (ANI ADDR xxxxxxxx), CID yyyy [s]
FILE=t, LINE=u
- [20] VER GTT a DBI kkk COMPLETED
BAD DBTOC MAGIC - X'yyyyyyyyy
FILE=t, LINE=u
- [21] VER GTT a DBI kkk COMPLETED
BAD INDEX idx IN ANI RECORD ani (ANI ADDR xxxxxxxx)
FILE=t, LINE=u
- [22] VER GTT a DBI kkk COMPLETED
BAD INDEX idx IN ANI RECORD ani (ANI ADDR xxxxxxxx)
FILE=t, LINE=u
- [23] VER GTT a DBI kkk COMPLETED
BAD NCP s IN ANI RECORD ani (ANI ADDR xxxxxxxx)
FILE=t, LINE=u
- [24] VER GTT a DBI kkk COMPLETED
BAD DBI kkk IN CID yyyy NCP [s] (CID ADDR xxxxxxxx)
FILE=t, LINE=u
- [25] VER GTT a DBI kkk COMPLETED
BAD NPANXX PTR idx IN ANI ROOT ani (ANI ADDR xxxxxxxx)
FILE=t, LINE=u
- [26] VER GTT a DBI kkk COMPLETED
BAD PARENT ani IN ANI RECORD ani (ANI ADDR xxxxxxxx)
FILE=t, LINE=u
- [27] VER GTT a DBI kkk COMPLETED
BAD PARENT ani IN ANI RECORD ani (ANI ADDR xxxxxxxx), SHOULD BE ani
FILE=t, LINE=u
- [28] VER GTT a DBI kkk COMPLETED
BAD RANGE DATA (pppp, pppp) IN AVL ROOT ani (ANI ADDR xxxxxxxx)
FILE=t, LINE=u
- [29] VER GTT a DBI kkk COMPLETED
BAD RANGE IN ANI RECORD ani (ANI ADDR xxxxxxxx)
LOW pppp IS NOT <= HIGH pppp
FILE=t, LINE=u

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- [30] VER GTT a DBI kkk COMPLETED
BAD RIGHT POINTER (pppp) IN AVL ROOT ani (ANI ADDR xxxxxxxxx)
FILE=t, LINE=u
- [31] VER GTT a DBI kkk COMPLETED
BAD TABLE ADDR - X'xxxxxxxx
FILE=t, LINE=u
- [32] VER GTT a DBI kkk COMPLETED
BAD TLPTR (ani) IN CID yyyy (CID ADDR xxxxxxxxx)
FILE=t, LINE=u
- [33] VER GTT a DBI kkk COMPLETED
INTERNAL ERROR - BAD AVL ROOT ani
FILE=t, LINE=u
- [34] VER GTT a DBI kkk COMPLETED
INTERNAL ERROR - BAD CID - yyyy
FILE=t, LINE=u
- [35] VER GTT a DBI kkk COMPLETED
INTERNAL ERROR - BAD DBI - kkk
FILE=t, LINE=u
- [36] VER GTT a DBI kkk COMPLETED
INTERNAL ERROR - BAD INDEX - idx
FILE=t, LINE=u
- [37] VER GTT a DBI kkk COMPLETED
PARENT LOW RANGE pppp (ani/X'xxxxxxxx) OVERLAPS WITH
CHILD pppp (ani/X'xxxxxxxx)
FILE=t, LINE=u
- [38] VER GTT a DBI kkk COMPLETED
TREE TOO DEEP: ANI ani, CID yyyy
FILE=t, LINE=u
- [39] VER GTT a DBI kkk COMPLETED
ASSERTION FAILED FILE=t LINE=u
v
ERRNO=w(x)
- [40] VER GTT a DBI kkk COMPLETED
CUSTID yyy DBI kkk USED q TIMES HAS NO POINT CODE
APPDB DBI ADDR X'nnnnnnnn
- [41] VER GTT a DBI kkk COMPLETED
TT ccc DBI kkk USED nn TIMES HAS NO POINT CODE
APPDB DBI ADDR X'nnnnnnnn

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- [42] VER GTT a DBI kkk COMPLETED
CUSTID r DBI kkk USED nn TIMES HAS NO POINT CODE
APPDB DBI ADDR X'nnnnnnnn
- [43] VER GTT a DBI kkk COMPLETED
BAD CUSTIDX, TT ccc ABC eee DEF fff GHIJ pppp
CUSTIDX r
- [44] VER GTT a DBI kkk COMPLETED
TT ccc ABC eee DEF fff GHIJ pppp REFERS TO DBI kkk
DBI kkk IS NOT ASSIGNED
- [45] VER GTT a DBI kkk COMPLETED
BAD CUSTIDX, TT ccc ABC eee DEF fff GHIJ pppp
CUSTIDX r
- [46] VER GTT a DBI kkk COMPLETED
INV PREFIX xx IN CMPN RECORD AT nnnnnnnn
- [47] VER GTT a DBI kkk COMPLETED
DUP CMPN TAGS eeefff and eeefff (nnnnnnnn)
- [48] VER GTT a DBI kkk COMPLETED
EMPTY REC IN CHAIN xx AT nnnnnnnn
- [49] VER GTT a DBI kkk COMPLETED
CHAIN TOO LONG xx AT nnnnnnnn
- [50] VER GTT a DBI kkk COMPLETED
INV INDEX xx AT nnnnnnnn
- [51] VER GTT a DBI kkk COMPLETED
REV-HASHED BAD CMPN INDEX xx AT nnnnnnnn
- [52] VER GTT a DBI kkk COMPLETED
INV CMPN INDEX xx AT nnnnnnnn
- [53] VER GTT a DBI kkk COMPLETED
CHAIN HAS EMPTY REC xx AT nnnnnnnn
- [54] VER GTT a DBI kkk COMPLETED
CHAIN TOO LONG xx AT nnnnnnnn
- [55] VER GTT a DBI kkk COMPLETED
INV INDEX xx AT nnnnnnnn
- [56] VER GTT a DBI kkk COMPLETED
REV-HASHED BAD CMPN INDEX xx AT nnnnnnnn

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- [57] VER GTT a DBI kkk COMPLETED
UNEXPECTED RESP FROM DS FOR pppp - x
- [58] VER GTT a DBI kkk COMPLETED
TIMED OUT WAITING FOR DLN OUTPUT
- [59] VER GTT a CUSTID yyyy COMPLETED
TIMED OUT WAITING FOR DLN OUTPUT

2. REASON FOR OUTPUT

Formats 1-11. These output messages are in response to a previously input VER:GTT message.

Formats 12-59. These output messages give diagnostic information on internal problems found in the 10-Digit GTT data structures. The address given is relative to the APPDB translation space in any of the valid disk files ("/dev/appdb0", "/dev/appdb1" or "/dev/appdb2") or the DLN, based on the input request.

3. VARIABLE FIELD DEFINITIONS

- a RNA x where x is the ring node address (RNA) of a direct link node (DLN). This field is optional based on whether the input command specified an RNA x. The field could be a lone keyword equal to SHADOW or SCRATCH. For this case, the APPDB database used is /dev/appdb1 or /dev/appdb2, respectively. If the field a does not exist, the APPDB used is /dev/appdb0.
- b ACTIVATED — Feature is active.
DEACTIVATED — Feature is not active.
- ccc This is the translation type (TT), which should have a value of either 242, 252 or 253. TT 252 is used for the SDN services and all digits listed are the dialing number. TT 253 is used for 800 and 900 services and all digits listed are the dialed number. TT 242 is used for Positive Call Processing (PCP) GT Translations.
- d This gives the total number of entries in the 10-digit GTT database for the specified translation type.
- eee This represents the first 3 digits of the automatic Number identification (ANI), referred to as the ABC digits or the NPA.
- fff This represents the second 3 digits of the automatic number identification (ANI), referred to as the DEF digits or the NXX. For Format 3, the value of fff can be ALL.
- ggg This represents the subsystem number (SSN) of a network database (network control point [NCP]). Routing to an NCP is based on a point code (hhhhhhhhh) and the SSN.
- hhhhhhhhh This represents the point code (PC) of a network database (NCP).

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w	The system error number.						
x	A short phrase telling what the system error number means.						
xx	Number which represents the ANI TABLE record number or the ANI TABLE chain that is in error.						
xxxxxxxx	A byte address in DLN memory relative to the beginning of the in-core APPDB database.						
yyyy	A customer index. Valid customer indexes range from 1 to 9999.						
yyyyyyyy	A core data value in hexi-decimal notation.						
z	a number indicating the SPGT record's Numbering Plan Type (0 indicates NANP, 1 indicates APN). (For TT 252 only).						
zzzz	Indicates the database spectrum (or numbering plan type) the information came from. The possible values are: <table><tr><td>APN</td><td>— Action point numbering plan, only valid with TTs 242 and 252.</td></tr><tr><td>NANP</td><td>— North American numbering plan, only valid with TTs 242 and 252.</td></tr><tr><td>NONE</td><td>— A numbering plan does not exist, only valid with TT 253.</td></tr></table>	APN	— Action point numbering plan, only valid with TTs 242 and 252.	NANP	— North American numbering plan, only valid with TTs 242 and 252.	NONE	— A numbering plan does not exist, only valid with TT 253.
APN	— Action point numbering plan, only valid with TTs 242 and 252.						
NANP	— North American numbering plan, only valid with TTs 242 and 252.						
NONE	— A numbering plan does not exist, only valid with TT 253.						
Y	Indicates the NCP Index used within the CID Record for which this line of information applies (values can be from 0 to 2 inclusive.)						
ZZ	The database tree within the numbering plan type that the information originates from. The possible values are: <table><tr><td>03</td><td>— Tree traversed with just 3 digits.</td></tr><tr><td>06</td><td>— Tree traversed with 6 digits.</td></tr><tr><td>10</td><td>— Tree traversed with 10 digits.</td></tr></table>	03	— Tree traversed with just 3 digits.	06	— Tree traversed with 6 digits.	10	— Tree traversed with 10 digits.
03	— Tree traversed with just 3 digits.						
06	— Tree traversed with 6 digits.						
10	— Tree traversed with 10 digits.						
ani	A reference to an ANI record block in the SPGT ANI TABLE.						
idx	A reference to an NPANXX record block in the SPGT NPANXX TABLE.						

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4. ACTION TO BE TAKEN

Formats 1-11. These are normal output messages in response to the corresponding format in the VER:GTT input message.

Formats: 12, 13, 43, 44, 45, 47 with a TT of 252 specified in the VER:GTT input command.

Remove that npt/npanxx using the input command RC:GTT with the following options:

- Translation type: 252
- Database Operation: D
- Digit number: npanxx from eeefff of VER:GTT output
- Numbering Plan Type: npt from the VER:GTT input command or if no npt was specified then "N".

Formats 13-57. There is potential corruption in the APPDB (10-digit GTT database). Notify National Electronic Switching Assistance Center (NESAC).

Formats 58-59. The switch is under a heavy update load, retry in 30 minutes.

5. REFERENCES

Input Messages

DUMP:RNA

VER:GTT

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**1A/1B Processor Recent Change
Throughput Improvements
Feature (4057)**

13

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1A/1B Processor Recent Change Throughput Improvements Feature (4057)

13

1. Feature Description

1.01 Recent investigations of the Recent Change (RC) process have uncovered a bottleneck (disk reads and writes) that consumes over 70 percent of the total time for RCs. Further investigation of the software that controls the disk reads/writes indicated that many of those operations were not necessary because of the technological upgrades and other 4ESS™ switch enhancements.

1.02 The 1A/1B Processor RC software currently does many different operations to load a specific RC. Of all the operations involved, writing the new RC data to the 3B Attached Processor System (APS) is the most time consuming. This is a required process because the 3B APS is used as an emergency data backup source if the 1A/1B Processor data becomes corrupted. The data backup procedure involves several data reads and writes to ensure integrity of the newly applied RC. 4ESS switch lab measurements using Positive Call Processing (PCP) data identified approximately 16 read and 7 write operations performed for each RC applied to the switch.

1.03 The activation of this feature will eliminate unnecessary disk reads/writes and reduce the amount of time needed for each RC operation. The identified Direct Memory Access (DMA) reads that are unnecessary will be eliminated due to the technological and software enhancements made to the 4ESS switch through its life cycle. Throughput improvement will reduce the amount of time required to complete Code Grouping, Trunking, and PCP Automatic Number Identification (ANI) RCs by 8 to 12 percent.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

7.01 This feature will be deployed using a Software Change Procedure (SCP).

Turn On/Turn Off Mechanism

7.02 This feature is automatically turned on by software deployment. Once the software is loaded, the feature cannot be turned off.

8. Input/Output Manual Pages (Not Affected)

Never Miss a Call Feature (4136)

14

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Never Miss a Call Feature (4136)

14

1. Feature Description

- 1.01** Never Miss a Call (NMC) is a pre-answer call redirection feature. It provides Centralized Alternate Destination Call Redirection (CADCR) to those switched-egress customers who were not offered CADCR because of how the Local Exchange Carrier (LEC) end office handled certain busy conditions. The primary capability of this feature is that a customer's call can be redirected even if the LEC does not return a busy trigger to the original AT&T switch. However, the customer must subscribe to Ring/No Answer (RNA) also for the NMC feature to work.
- 1.02** Prior to the NMC feature, some switched-egress customers actually missed calls because the LEC did not always return a busy trigger to the originating AT&T switch. With the NMC feature, this deficiency has been removed. In order to provide busy call redirection to customers who are serviced by a LEC end office that does not have the capability to return a busy trigger to the originating AT&T switch, both the CADCR and the RNA features have to be invoked.
- 1.03** Ring/No Answer is a 4E16 Release 1 feature offering that provides the 4ESS™ switch with the capability to redirect a call to an alternate destination if the call is not answered within a specified time. The RNA feature supports both direct-connect and switched-egress access at primary and secondary locations. When a call cannot be completed to a primary destination because of a busy condition, it will automatically be redirected to a presubscribed secondary destination.
- 1.04** Specifically, the NMC feature increases the number of CADCR triggers that invoke a redirection and expands the conditions under which the RNA timer is activated for switched-egress calls.

- 1.05** This feature is proprietary since a Network Control Point (NCP) is required for operation.

Switched 800 Telecommunications Services Supported

- 1.06** This feature can accommodate the following Switched 800 Telecommunications Services:
- 800 *READYLINE*® telecommunications service
 - 800 *Masterline*® telecommunications service
 - Basic 800 service
 - CustomNet 800
 - Uniplan
 - 800 Gold.

Feature Requirements

- 1.07** The following requirements are applicable to the NMC feature:
- The primary and secondary routing numbers must be Plain Old Telephone System (POTS) numbers. However, the secondary numbers cannot be 800 or 900 numbers.
 - The following signaling protocols must exist in the AT&T network for this feature to be operative:
 - AT&T 4ESS switch-to-4ESS switch signaling—Integrated Services Digital Network User Part (ISUP)
 - Originating AT&T switch-to-LEC end office/Access Tandem—ISUP or In-Band Signaling
 - Originating AT&T switch-to-INWATS Data Base NCP—Transaction Capabilities Application Part (TCAP)
 - Originating AT&T switch-to-Direct Services Dialing (1DSD) NCP—TCAP.
 - During a call attempt to the primary location, the following triggers will invoke the NMC feature at the originating AT&T switch:
 - A Common Channel Signaling System 7 (CCS7) Address Complete Message (ACM) with a cause value of "user busy" is received at the originating AT&T switch.

- A CCS7 ACM with a cause value of "no circuit available" is received at the originating AT&T switch.
 - A CCS7 Release (REL) message with a cause value of "no circuit available" is received at the originating AT&T switch.
 - A CCS7 ACM indicates interworking with MF is received at the originating AT&T switch.
- The feature functionality of the CADCR and RNA for direct-connect customers must remain unaffected by the NMC feature.

2. Call Flow

Call Flow Key Points

2.01 If a switched-egress customer subscribes to the NMC feature, and two sets of routing/billing information are returned to the 4ESS switch by the NCP and the LEC does not have the capability to return a busy trigger to the originating AT&T switch, the following will occur:

1. The originating switch will first attempt to complete the call using the primary routing number in the primary routing domain.
2. If the signaling messages received from the LEC are incomplete, the originating AT&T switch will start the RNA timer and play audible ring or some other announcement/tone to the calling party. The caller will remain connected to audible ringing/tone until the call is answered or the timer times out. No cut-through is performed on the voice path.
3. If the phone is busy, the call will go undetected by the originating AT&T switch (no busy trigger) and will be assumed unanswered. When the RNA timer expires, the call will be redirected. The switch will then attempt to complete the call using the secondary routing number in the secondary routing domain.
4. If the phone is ringing and the called party does not answer, the RNA timer will expire and the call will be redirected. If the phone rings and the called party answers before the RNA timer expires, no redirection occurs. The call will receive normal handling treatment.
5. When a redirection attempt is made, the Automatic Message Accounting (AMA) record is updated with the secondary routing and billing information and is marked to indicate that a redirection has taken place.

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Turn On/Turn Off Mechanism

7.01 This feature is turned on automatically by software deployment. Ubiquity of the generic across the network is not required before the feature can be fully operational.

8. Input/Output Manual Pages (Not Affected)

**International ISDN User Part
(INUP) Echo Control—Phase 2
Feature (4180a)**

15

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**International ISDN User Part
(INUP) Echo Control—Phase 2
Feature (4180a)**

15

1. Feature Description

1.01 Phase 1 of the International Integrated Services Digital Network User Part (INUP) Echo Control feature, released in October 1993, provided rules for setting the echo control device indicator in INUP signaling messages such as Initial Address Message (IAM), Address Complete Message (ACM), Call Progress Message (CPG), and Answer (ANS). The correct settings are required to provide International Switched Transit Service (ISTS).

1.02 The INUP Echo Control—Phase 1 feature set the echo control indicator in INUP messages based on trunk assignment. With a trunk assignment of "none," the echo control indicator is set to "Echo control device not included." With a trunk assignment of "EC," for Echo Control, the echo control indicator is set to "Echo control device included." With a trunk assignment of "PCC," for Per Call Control, the echo control indicator in an INUP message is set to "Echo control device included" for voice calls and "Echo control not included" for data calls.

1.03 The current feature (Phase 2) expands the application of the INUP Echo Control feature (4180) to include INUP Per Call Control (PCC) test calls, such as digital Loop Test Line calls and calls to the International Type A digital responders. Phase 2 is part of the 4E18 Release 2 Generic.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

- 7.01 All 4ESS™ International Switching Centers must be equipped for service introduction.

8. Input/Output Manual Pages (Not Affected)

Increase International Point Codes Feature (4213)

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Increase International Point Codes Feature (4213)

16

1. Feature Description

1.01 This feature increases the number of international point codes available at International Switching Centers from 64 to 128. This increases the number of countries that can be homed on International Switching Center 4ESS™ switches.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Turn On/Turn Off Mechanism

7.01 This feature is turned on automatically with the deployment of 4AP12 software.

8. Input/Output Manual Pages (Not Affected)

ABC Architecture Modification: Identification of Terminating Switch Feature (4218)

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ABC Architecture Modification: Identification of Terminating Switch Feature (4218)

17

1. Feature Description

1.01 The Adjunct Based Capabilities (ABC) architecture for the 4ESS™ switch requires that an "Egress Indicator" be provisioned in the translation data to determine that it is the terminating switch for ABC functions. However, due to the cancellation of features that used the terminating switch functions in the original ABC architecture, support for provisioning the Egress Indicator was not provided in the core network provisioning systems.

1.02 To resolve this problem, an ABC modification has been added to the number of methods the 4ESS switch uses to determine that it is the "terminating" switch for a call. This feature now allows the 4ESS switch to determine that it is the terminating switch for a given call based on *either* the Egress Indicator associated with the code group *or* the traveling classmark received in the incoming Integrated Services Digital Network User Part (ISUP) Initial Address Message. This option has been selected instead of pursuing the necessary core network provisioning system development due to the short time requirements.

2. Call flow (Not Affected)

3. Provisioning

Architecture

- 3.01** This feature modifies the capabilities in the ABC architecture but makes no changes to the overall architecture.

Limits and Restrictions

- 3.02** This feature identifies only the terminating switch for interswitch calls due to the use of the ISUP traveling classmark. On intraswitch calls, the originating/terminating switch is not identified as a "terminating" switch by this feature.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance (Not Affected)

7. Transition Considerations

- 7.01** This feature is automatically turned on by software deployment.

8. Input/Output Manual Pages (Not Affected)

Updates and Notices

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Updates and Notices

18

1. Differences between 4E18 Release 2 and 4E19 Release 2

- 1.01** When the 4E18 and 4E19 releases were planned, it was intended that the capabilities in the two releases would be exactly the same, the only difference being that 4E18 would run on the 1A—4ESS™ Switch Processor and 4E19 on the 1B—4ESS Switch Processor.
- 1.02** In testing for 4E19R1, however, two problems were discovered. Those problems were fixed in 4E19R2 and not in 4E18R2 [with the agreement of the National Electronics System Assistance Center (NESAC) and Bell Laboratories Field Support] due to significant patch space limitations in 4E18R2.
- 1.03** The fixes are associated with the following two Modification Requests (MRs):
- 4e208788—Allow Digital Interface Frame (DIF) controllers to be removed during Extended Disk Outage Strategy (EDOS), with the understanding that Digital Interface Frame Export Version 1 (DIF-E1) controllers cannot be restored by either the DGN or UCL command as long as the 3B Processor remains duplex fail.
 - 4e208791—Allow the Service Circuit System (SCS) controller to be removed during EDOS. In procedure "SCS_CRMV_C_OPT", remove lines 7400 - 7640. SCS never required this check because SCS can be diagnosed and restored even if the 3B Processor is duplexed failed (EDOS).
- 1.04** In summary, the DIF controller and the SCS controller can be removed during EDOS in 4E19R2 but not in 4E18R2.

Abbreviations and Acronyms

A

AAM
Announcement Address Mapping

AAP
Announcement Administrator
Processor

ABC
Adjunct Based Capabilities

ACG
Automatic Call Gapping

ACM
Address Complete Message

ACV
Access Charge Verification

ADPCM
Adaptive Differential Pulse Code
Modulation

AFSC
Advanced Feature Service Center

AIN
Advanced Intelligent Network

AMA
Automatic Message Accounting

ANI
Automatic Number Identification

ANS
Answer

ASM-Plus
Announcement System Manager —
Plus

B

BLDS
Business Long Distance Services

C

CADCR
Centralized Alternate Destination Call
Redirection

CCS
Common Channel Signaling

CCS7
Common Channel Signaling System 7

CIC
Carrier Identification Code

CIM
Call Irregularity Message

CNAC
CCS National Administration Center

CNCE
CCS Network Critical Events

CNI
Common Network Interface

CPG
Call Progress Message

CRC
Cyclic Redundancy Check

D

DARICS

Data Acquisition Reports and
Integrated Communications System

DIF

Digital Interface Frame

DIF-E1

Digital Interface Frame Export Version
1

DLN

Direct Link Node

DMA

Direct Memory Access

DMQ

Direct Measure of Quality

DN

Destination Number

DNT

Dialed Number Trigger

DPC

Destination Point Code

DSA

Direct Services-ANI-based

DSD

Direct Services Dialing

E

EAMF

Equal Access Multifrequency

EBAF

Extended Bellcore AMA Format

EC

Echo Control

ECD

Equipment Configuration Database

EDOS

Extended Disk Outage Strategy

F

FG-D

Feature Group-D

FHC

Final Handling Code

FMLI

Forms and Menu Language Interpreter

FPCR

Full Point Code Routing

G

GTT

Global Title Translation

I

IAM

Initial Address Message

IBGTT

Inbound Global Title Translation

ID

Identification

IDB

INWATS Data Base

INUP

International Integrated Services Digital
Network User Part

IR
Incident Report

IRAS
Integrated Routing Assignment System

ISTS
International Switched Transit Service

ISUP
Integrated Services Digital Network
User Part

L

LCC
Local Carrier Connecting

LEC
Local Exchange Carrier

M

MTP
Message Transfer Part

N

NBS
Network Equipment Building Standards

NCP
Network Control Point

NESAC
National Electronic Switching
Assistance Center

NI
Network Interconnect

NMC
Never Miss a Call

NOC
Network Operations Center

NOCS
Network Operations Center System

NPA-NXX
Numbering Plan Area Number

NRN
Network Routing Number

O

OB
Outbound

OBGTT
Outbound Global Title Translation

ODA
Office Data Administrator

ODA
Office Data Assembler

P

PBX
Private Branch Exchange

PC
Personal Computer

PC/SSN
Point Code/Subsystem Number

PCC
Per Call Control

PCM
Pulse Code Modulation

PCP
Positive Call Processing

PCPGTT
Positive Call Processing Global Title
Translation

PHED
Phrase Editor

PINET
AT&T-C Packet Network

POTS
Plain Old Telephone Service



R

RC
Recent Change

RDBMS
Relational Database Management
System

RNA
Ring/No Answer



S

SADC
Special Access Data Channel

SCCP
Signaling Connection Control Part

SCP
Service Control Point

SCP
Software Change Procedure

SCC
Service Circuit Controller

SCS
Service Circuit System

SCSI
Small Computer System Interface

SCU
Service Circuit Unit

SDN
Software Defined Network

SDN-SMS
Software Defined Network—Service
Management System

SDNCC
Software Defined Network Control
Center

SEP
Signaling End Point

SINDEX
Sampling Index

SLT
Switch Local Time

SNAS
Signaling Network Analysis System

SPGTT
Self-Provisioning Global Title
Translation

SRST
Signal Routing Set Test

SSN
Subsystem Number

SSP
Service Switching Point

STC
Single Trunk Customer

STP
Signal Transfer Point

T

TCAP

Transaction Capabilities Application
Part

TCC

Technical Control Center

TCP/IP

Transmission Control Protocol/Internet
Protocol

TNS

Transit Network Selection

TOP

Task Oriented Practices

TPO

Transaction Processing Option

TSG

Trunk Subgroup

U

UGT

Universal Global Translator