AT&T

4ESS™ **SWITCH**

Product Release Document
4E20 Release 2 Generic

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Document Title: *4ESS*™ Switch - Product Release Document - 4E20 Release 2 Generic

Document No.: AT&T 234-090-202AC   Issue Number: 1   Date: April 1995

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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 4E20 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 4E20 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 Electronic Switching 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 4E20 Release 2 Generic contains 19 new features. Each chapter in this document provides information about these features. The chapters are in numerical order according to feature number. The chapter titles are also the feature names.

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: *Advanced Intelligent Network (AIN) Selective Default Routing for Dialed Number Trigger Calls Feature (415)*

This Local Exchange Carrier (LEC) feature allows the *4ESS* switch, operating as a Service Switching Point (SSP), to selectively route Advanced Intelligent Network (AIN) Dialed Number Trigger (DNT) calls when routing information from the Service Control Point (SCP) is unavailable.

Chapter 2: *Explicit 4-Digit Carrier Identification Indication for Network Traffic Management (NTM) Feature (417)*

This LEC feature allows network traffic managers using the Netminder/Network Traffic Management (NTM) system to identify which streams of traffic are being affected by control actions that were initiated by the Network Management Display System (NMDS).

Chapter 3: *10288 Access to Software Defined Network (SDN) Feature (3857)*

The 10288 Access to the Software Defined Network (SDN) feature provides a mechanism for identifying calls that are routed over 10288 access trunks as SDN calls. Calls are identified as SDN based on their Automatic Number Identification (ANI) via the *4ESS* switch ANI Trigger Table.

Chapter 4: *End-to-End Class-of-Service (ECOS)—Circuit Selection Capability Feature (4018a)*

This feature adds the capability to select a Trunk Subgroup (TSG) with specific circuit characteristics to the End-to-End Class-of-Service (ECOS) feature (4018).

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Chapter 5: *Multiple 4ESS™ Switch Network Announcements—Phase 2 Feature (4232a)*

The Multiple *4ESS* Switch Network Announcements—Phase 1 feature, introduced in the 4E18 Release 3 Generic, enabled the switch to give final handling treatments and terminating announcements in different languages based on the location of the caller. The current feature (Phase 2) provides new recent change procedures for implementing this feature in 4E20 Release 2 and later generics.

Chapter 6: *Software Defined Data Network—International for Unitel Feature (4275)*

The Software Defined Data Network—International (SDDN-I) for Unitel feature enhances the SDDN-Canada service by allowing Unitel to offer inbound and outbound international data calls. This feature allows Unitel customers to place data calls to and receive data calls from customers outside Canada and the United States (referred to as international calling). Unitel international data calls are routed through Canada's international carrier (Teleglobe) to their destinations.

Chapter 7: *Generic Indicators in Tracer Records Feature (4314)*

This feature enhances the Automatic Message Accounting (AMA) in two ways. First, it standardizes the assignment of AMA Sequence Number Fields produced by the *4ESS* switch and the Call Detail Recording Platform (CDRP). Secondly, it provides Network Recording Management (NRM) generic release information, giving work centers greater visibility of software changes in the switch at release introduction.

Chapter 8: *Service Count Tracer Records for Unanswered/Mutilated Calls Feature (4317)*

This feature adds two new Service Count AMA tracer records, "Unanswered" and "Mutilated." These counts, along with the three that previously existed, are used to audit a network element's Call Detail Recording process.

Chapter 9: *Easy Reach® Service 1+500 Dialing Plan Feature (4324)*

This feature provides 1+500 access to *Easy Reach* service via the *4ESS* switch and addresses the evolution of the *Easy Reach* service architecture to reduce unit cost and post dialing delay for 1+500 dialed *Easy Reach* service calls. It also to provide a platform on which to build feature interworking with ANI-based services.

Chapter 10: *Recent Change Administration System (RCAS)—Phase 2 Feature (4366)*

The Recent Change Administration System (RCAS) is a generic capability used to update administrative data in the *4ESS* switch. The RCAS platform enhances the office data provisioning throughput into the *4ESS* switch by moving Recent Change (RC) functionality into a remotely located processor called RCAS. This feature allows provisioning Operating Systems to send RC data to the RCAS platform for update instead of to the *4ESS* switch. This is done to decrease the RC session time from about 6.0 seconds per update to less than 1.0 second per update.

Chapter 11: *International Billed Number Screening (IBNS)—Phase 2 Feature (4430)*

This fraud control feature assures that all foreign Post Telephone and Telegraph (PTT) operator-assisted calls destined for the United States will be routed to the AT&T Switched Network (ASN) for billing validation before proceeding further.

Chapter 12: *Signaling Impact on Procedures for Tones and Announcements Feature (4449)*

This feature provides final handling treatments, initiated at the International Switching Center (ISC), for voiceband calls when an Address Complete Message (ACM) is followed by either a backward Release (REL) message or an Unsuccessful Setup Backward Information Message (UBM) on certain types of outgoing Integrated Services Digital Network User Part (ISUP) or Telephone User Part (TUP) trunks.

Chapter 13: *Software Defined Network 1+10 Digit Dialing on Dedicated Access Feature (4474)*

The Software Defined Network (SDN) 1+10 Digit Dialing on Dedicated Access feature allows the *4ESS* switch to accept the prefix **1** when customers use a 10-digit North American Numbering Plan (NANP) number. The number is dialed from dedicated access locations.

This feature also eliminates the critical 8th digit timing to decide if an SDN 7-digit or NANP 10-digit number is dialed.

Chapter 14: *Routing and Billing for International 800 Service Calls from Mexico and the Caribbean Feature (4530)*

Mexico and the Caribbean are assigned distinct Pseudo Country Codes (PCCs) for International 800 (I800) Service traffic. After this feature (Routing and Billing for International 800 Service Calls from Mexico and the Caribbean) is activated, the International Direct

Distance Dialing (IDDD) Country Code (CC) will replace the PCC, and the End Office code (NXX) will be used to distinguish these two subregions.

Chapter 15: *Self-Provisioning Global Title Translation (SPGTT) Table Expansion Feature (4538)*

The SPGTT Table Expansion feature increases the number of Network Control Points (NCPs) that the Global Title Translation (GTT) table can identify from 128 to 256. This feature also increases the number of unique NCP point code/subsystem number combinations per Customer ID from 3 to 8.

Chapter 16: *Software Defined Network (SDN) Access Numbering Plan Area (NPA) Table Feature (4540)*

This feature is an enhancement to the 10288 Access to SDN feature (3857). The purpose of the feature is to reduce the number of queries made to the Universal Global Translator (UGT) database.

Chapter 17: *AT&T Trigger Platform Jr.—Busy/Ring No Answer Feature (4555)*

The Software Defined Network—Network Remote Access (SDN-NRA) Using Automatic Speech Recognition (ASR) feature will allow inband ringing and busy to be monitored as triggers.

Chapter 18: *Interim 1+500 Via the 4ESS™ Switch Feature (4575)*

This interim feature was placed in service in November 1994 to give personal number service to subscribers of *Easy Reach®* and *True Connections* services. This feature allows 1+500 calls to be routed through selected *4ESS* switches. Another solution based on a different architecture, Feature 4324, is introduced in the 4E20 Release 2 Generic.

Chapter 19: *Predictive Zero Maintenance (PZM)-Triggered iPCC Gateway Orders Feature (4579)*

This feature offers an enhanced testing and troubleshooting capability in the *4ESS* switch for the Transmitted Noise Reduction (TNR) feature (4386) and the Individual Per-Call Control (iPCC) feature (3795). Feature 4579 provides a means for Testing Operations Provisioning Administration System (TOPAS) or office personnel to send Start-of-Call and End-of-Call messages to the iPCC Gateway switch and the Universal Services Echo Canceler (USEC) to be used in various test scenarios.

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 contains safety labels in the form of CAUTIONS. A CAUTION safety label indicates the presence of a hazard that will or can cause minor personal injury or property damage if the hazard is not avoided.

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Worldwide: Toll 317 322-6577

FAX: 317 322-6484

7.03 Bell Operating Companies must process orders through their company documentation coordinator.

7.04 Federal Government orders must be processed through CIC.

Advanced Intelligent Network (AIN) Selective Default Routing for Dialed Number Trigger Calls Feature (415)

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Advanced Intelligent Network (AIN) Selective Default Routing for Dialed Number Trigger Calls Feature (415)

1

1. Feature Description

1.01 This feature allows the *4ESS*™ switch, operating as a Service Switching Point (SSP), to selectively route Advanced Intelligent Network (AIN) Dialed Number Trigger (DNT) calls when routing information from the Service Control Point (SCP) is unavailable, because one of the following events has occurred:

- The call was blocked by an Automatic Call Gap (ACG) control.

- The Response Message Timer expired before a response was received from the SCP.

- A Signaling Connection Control Part (SCCP) Unit Data Service error message, Direct Link Node (DLN), or Common Network Interface (CNI) returned message was received indicating that a query message to the SCP could not be delivered.

- The 1B Message Send Buffer overflowed or the CNI Ring is down.

1.02 When any of the events listed above occurs, this feature provides the following four selective routing options (after the playing of an optional announcement):

- The call may be routed to the Called Party Number, or

- The call may be routed to a specific default routing number, or

- The call may receive final treatment, or

- The call may be terminated to an announcement.

1.03 Feature 415 is based on the Bellcore Specification GR 1298 for AIN 0.2. The 4ESS switch provides an additional capability to terminate to an announcement. This particular capability is not specified in AIN 0.2. The process of terminating calls to an announcement is an important benefit since it assures that the caller will hear an announcement before the call is terminated. Prior to this feature, callers were not alway notified before their call was terminated.

1.04 This feature includes the capabilities provided by the AIN Global Default Routing for DNT Calls feature (Feature 411), which provides default routing to the Called Party Number when specific faults occur. Features 411 and 415 can be active and reside in the 4ESS switch at the same time to assist in transitioning to this feature. Refer to "Transition Considerations" in this chapter for information on transitioning from Feature 411 to Feature 415.

1.05 The capabilities provided by this feature apply only to AIN DNT calls. For information on AIN DNT calls, refer to AT&T 234-090-182AC, *4ESS™ Switch, Product Release Document, 4E18/4E19 Release 2 Generic* (Feature 375) or AT&T 234-090-019, *4ESS™ Switch, Advanced Intelligent Network (AIN) User's Guide*. Feature 375 must be active before this feature can be activated.

1.06 There are two levels of control for Feature 415. In the first, the service provider has the ability to turn Feature 415 on or off on a per-office basis. At this level, all DNT calls accessing this feature will receive final handling treatment. When Feature 415 is turned on in the office, the service provider can specify the type of routing a DNT call will receive on an individual DNT basis.

New DNT Parameter Elements

1.07 The following new elements were added to the DNT parameter to provide the selective default routing options:

■ AIN Fault Handling—This element specifies the type of handling that will apply to the DNT: default routing or final handling treatment. Final handling treatment is the default for this element.

■ Voice Announcement—This element specifies the voice announcement, if any, that will be played before the call is routed or terminated. This is an optional element and is not required to be populated. If it is used, the Service Circuit System (SCS) announcement system must be available. This element can specify any one of the 65,535 set "S" Service Circuit Unit (SCU) announcements provided by the SCS. The default for this element is no announcement will be played.

There is a direct mapping of the announcement ID specified in the Default Routing Voice Announcement parameter and the SCU announcement ID. The Announcement System Manager—Plus (ASM-Plus) is used to administer announcements on the SCS.

■ Default Routing Control Code—This element specifies the treatment that will apply to the call:

    — Route to the Called Party Number.

    — Route to a Specific Default Routing Number—When this treatment is specified, the Specific Default Routing Number must be populated.

    — Terminate (default for this element).

    — Specific Default Routing Number—This element specifies the number that will be used to route the call when specific faults occur (as described in the following section). It is not necessary to populate this element unless the Default Routing Control Code specifies Route to a Specific Default Routing Number. When populated, this element must contain 10 digits.

Default Routing Conditions That Determine Selective Routing

⇒ NOTE:
If an SSP Send Information Analyze Query (SIAQ) subtype was used on a 300-series Recent Change form to provision an AIN DNT, it could affect this feature (and Feature 411). The use of the SSP SIAQ subtype does not allow any default routing capabilities because Features 411 and 415 do not support the SSP SIAQ subtype.

1.08 When Feature 415 is turned on, the AIN Fault Handling parameter associated with the trigger is checked to determine how an AIN DNT call will be handled when a query message to the SCP could not be delivered, as described above.

1.09 An AIN Fault Handling parameter is provisioned for each DNT to indicate whether final handling treatment or selective default routing will apply to a call.

1.10 This feature provides for checking the Voice Announcement parameter first, then the Default Routing Control parameter. When the Voice Announcement parameter is populated, the specific announcement indicated by the SCU voice announcement number is played to the calling party. If the Voice Announcement parameter is not populated, an announcement will not be played.

⇒ NOTE:
The SCS announcement system is not included with this feature but must be available for Feature 415 if announcements are to be used. The SCU announcement number that is specified in the Default Routing Voice Announcement parameter must be resident on the SCS announcement system.

1.11 AIN triggers other than DNTs (Shared Interoffice Triggers) that are blocked by ACG controls (or the other conditions as stated above) will be given normal ACG final handling treatment.

1.12 This feature does not affect serial triggering. When the Route to Called Party Number option is selected during serial triggering, the previous legs of the serial triggers will be completed and the current leg will be processed as if a Continue message was received from the SCP.

1.13 When the Route to a Specific Default Routing Number option is selected during serial triggering, the previous legs of the serial triggers will be completed and the current leg will be processed as if a new routing number was received from the SCP.

1.14 A DNT can contain a default routing number and an SCS SCU announcement number. The SCS must be available to the *4ESS* switch SSP in order to use the voice announcement option.

1.15 Additional information on the SCS and the ASM-Plus is available in the following AT&T documents:

■ AT&T 234-100-130, *Service Circuit System (SCS), System Description*

■ AT&T 234-100-210, *Service Circuit System (SCS), Application*

■ AT&T 234-153-060, *Service Circuit System (SCS), Growth*

■ AT&T 234-151-077, *Service Circuit System (SCS), Maintenance*

■ AT&T 201-519-012, *Announcement System Manager—Plus, User's Guide.*

2. Call Flow

Feature Operation

2.01 As shown in Figure 1-1, AIN default routing is initiated when certain default routing conditions are encountered. Current routing processing will proceed if none of these conditions is encountered. These conditions, as previously described, are as follows:

■ The call was blocked by an ACG control.

■ The Response Message Timer expired before a response was received from the SCP.

■ An SCCP Unit Data Service error message, DLN, or CNI returned message was received indicating that a query message to the SCP could not be delivered.

■ The 1B Message Send Buffer overflowed or the CNI Ring is down.

2.02   When one of the conditions noted above is encountered, the *4ESS* switch SSP will check if this feature is present and active. If it is not active or not present, the *4ESS* switch SSP will check to determine if the AIN Global Default Routing for DNT Calls Feature 411 is present and active. If Feature 411 is present but inactive, the call will receive final handling treatment. If Feature 411 is present and active, the call will be routed to the Called Party Number.

2.03   If this feature is active, the AIN Fault Handling parameter associated with the DNT is checked to determine whether default routing or final handling will apply to this call.

2.04   If the AIN Fault Handling parameter indicates default handling, the *4ESS* switch SSP checks if a voice announcement is available. The SCS must be available in order to play voice announcements. If a voice announcement is available, it is played at this time.

2.05   After the announcement is played (or if an announcement was not available), the *4ESS* switch SSP checks the status of the Default Routing Control Code for the DNT to determine which call routing option was selected as follows:

■ If the Default Routing Control Code for the DNT specifies default routing to a specific default routing number, the SSP will route the call to the specific default routing number as a POTS call.

■ If the Default Routing Control Code for the DNT specifies routing to the Called Party Number, the SSP will route the call to the Called Party Number as a POTS call.

■ If the Default Routing Control Code for this DNT specifies termination, the SSP will check if an announcement was played. If an announcement was played, the call will receive High and Wet treatment (which means wait until the caller hangs up).

If an announcement was not played, the call will receive final handling treatment, which should include a general announcement that explains why the call could not be completed.

Default
Routing   No   Current
Conditions   ───▶   Routing
Encountered   Processing
                       Followed

Yes

Inactive   Selective
                Default   AIN Selective
(Default)   Routing   Default Routing
                Feature   for DNT Calls
                                       Feature 415
                Active

Final   AIN Fault   Default
Treatment   Handling   ───▶
(Default)   Parameter   Handling
                Checked

Final   inactive   Global   Voice   No (Default)
Treatment ◀───   Default Routing   Announcement
                       Feature   Available

                       Active   Yes

                       Route To   Play
                       Called Party   Announcement
                       Number as
AIN Global   Currently
Default Routing   Defined
for DNT Calls
Feature 411
                                                        Check
                                                        Default
                                                        Routing
                                                        Control Code
                                                        Status

                                        Called Party   Terminate   Default Routing
                                        Number   (Default)   Number

                                        Route To   Route To
                                        Called Party   Announcement Specific
                                        Number as   Played   Default
                                        Currently   ?   Routing
                                        Defined   Number

                                                   No   Yes

                                                Final   High
                                                Treatment   and
                                                             Wet

tpa 786777/C

Figure 1-1. AIN Default Routing Processing

Call Flow Example

2.06 In this example, an SCCP Unit Data Service error message is received, indicating that a query message could not be delivered to the SCP. This is one of the previously described events that impact this feature. Refer to Figure 1-2.

1. A call arrives from End Office 1 (EO) via Integrated Services Digital Network User Part (ISUP) Network Interconnect (NI) signaling. The SSP translates the Transit Network Selection (TNS), resulting in the indication of Analyze Called Party Number (ACPN). The SSP translation of the called number results in a DNT. Refer to Figure 1-2.

2. The SSP builds and attempts to send an Information Analyzed query to the SCP.

3. The Information Analyzed query could not be delivered to the SCP.

4. The SSP receives an SSP Unit Data Service error message.

5. The SSP checks to determine if this feature is active. If this feature is active, the AIN Fault Handling parameter is checked to determine whether selective default routing or final handling treatment will apply to this call.

    If this feature is inactive, the SSP will check for Feature 411. If Feature 411 is active, the call will be routed to the Called Party Number. If Feature 411 is inactive, the call will receive final handling treatment.

6. The SSP checks for a voice announcement, which has been customized for the subscriber by the service provider. As previously noted, announcements require the availability of the SCS. If an announcement is available, it is played at this time.

    If an announcement is not available, the call receives final handling treatment.

7. The Default Routing Control Code for the DNT is used to determine how the call will be routed as follows:

    ■ If the Default Routing Control Code for the DNT specifies default routing to a specific default routing number, the SSP will route the call to the specific default routing number as a POTS call (7A).

    ■ If the Default Routing Control Code for the DNT specifies routing to the Called Party Number, the SSP will route the call to the Called Party Number as a POTS call (7B).

    ■ If the Default Routing Control Code for this DNT specifies termination (7C), the SSP will check if an announcement was played. If an announcement was played, the call will receive High and Wet treatment (which means wait until the caller hangs up).

If an announcement was not played, the call will receive final handling treatment, which should include a general announcement that explains why the call could not be completed.
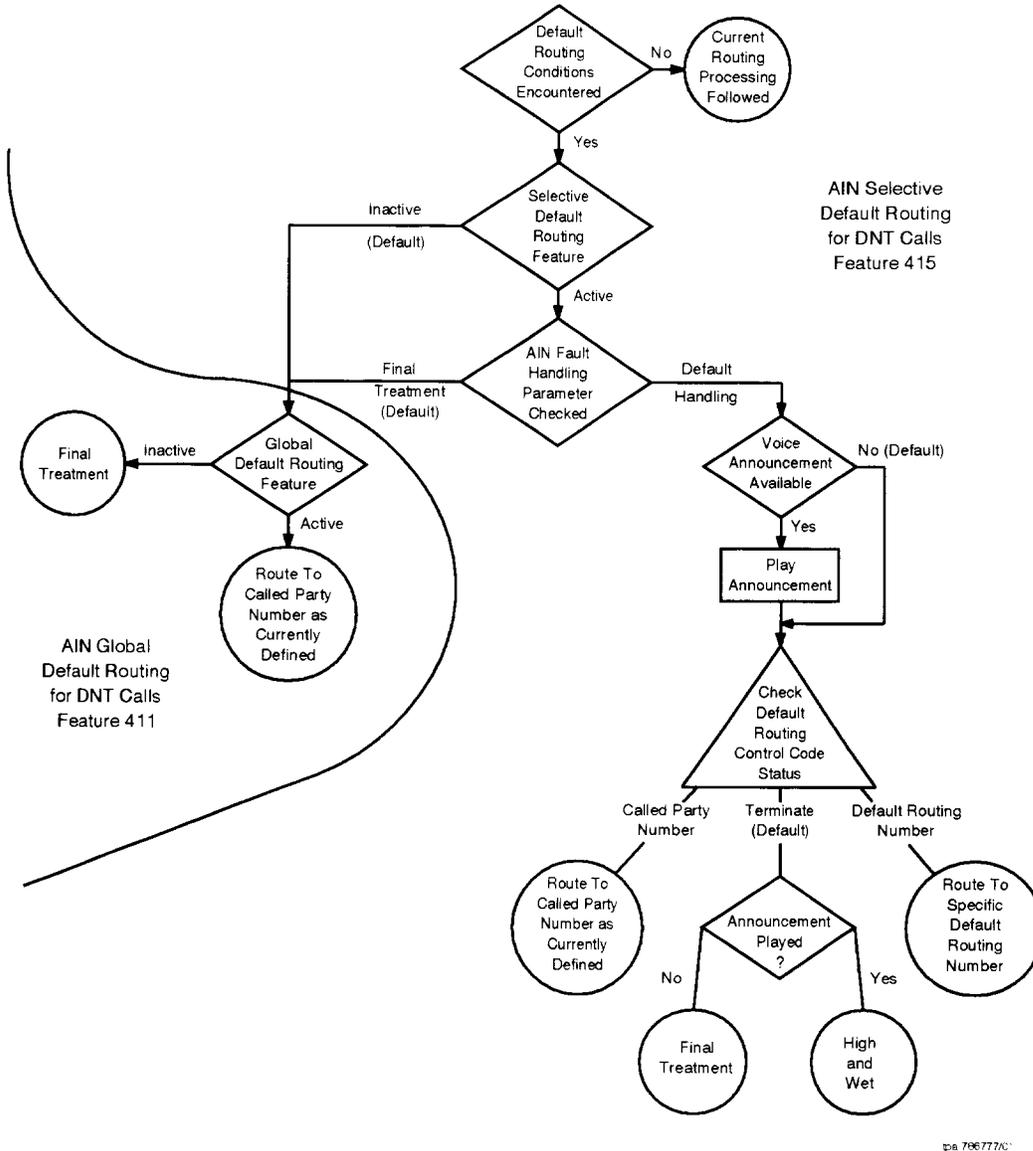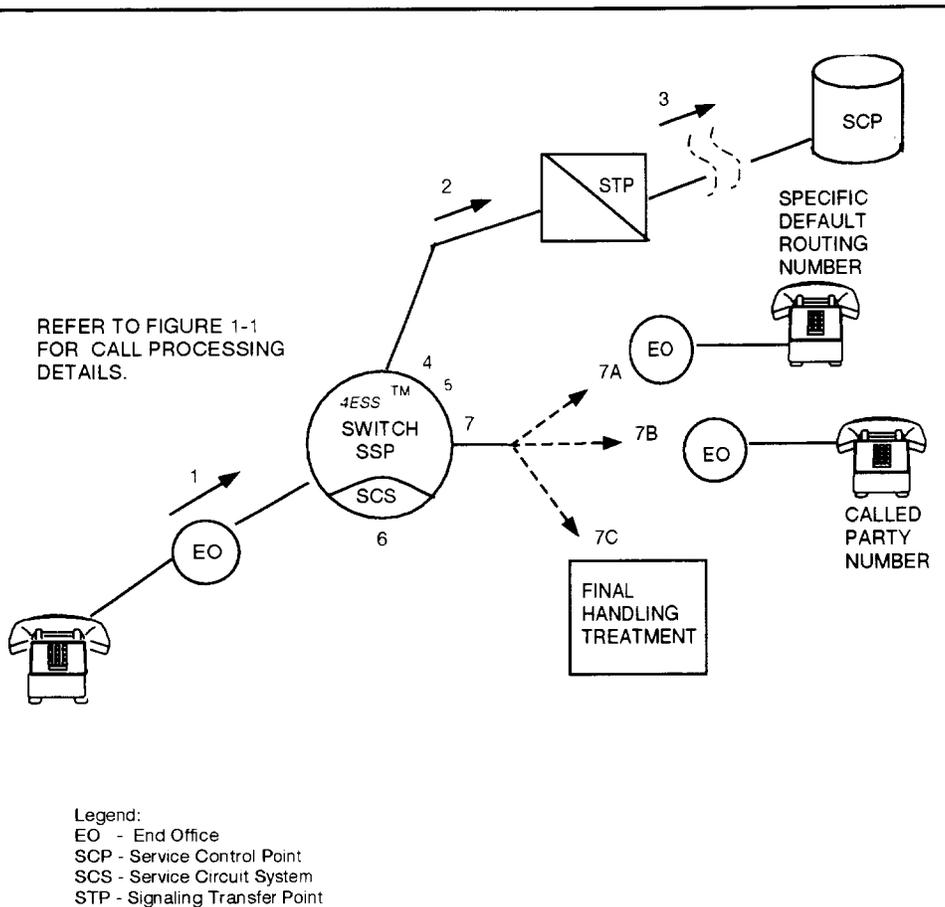

Figure 1-2. Selective Default Routing of an AIN DNT Call

3. Provisioning

3.01   Provisioning information for Feature 415 is included in 234-090-019, which will be provided at the time this feature is purchased. Contact your *4ESS* switch Account Executive for additional information.

4. Recording

4.01 When an AIN DNT call is default routed, the current leg of the call will be processed as if a Continue response without an Automatic Message Accounting (AMA) Service Logic Program Identifier (SLPID) parameter was received from the SCP for that leg. This applies to both call flow and AMA processing. For previous legs of the call, the AMA record will be generated normally (that is, answered if the leg is answered, but unanswered otherwise).

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

6.01 There are no new traffic counts for this feature. Existing measurements will be pegged when AIN selective default routing occurs as follows:

- The Network Management Control Blocks Call (NMBLK) measurement will be pegged when an AIN DNT call is blocked by an ACG control.

- The Signaling Failure Time Out At SSP (SIG-FAIL-TO) measurement will be pegged when the SCP does not respond to an AIN DNT query before the timer expires.

- The Call Processing Failure After Initial Query (FAIL-CP-AIQ) measurement will be pegged when a Unit Data Service message, DLN returned message, or CNI returned message is received.

- The Unavailable Resource Before Initial Query (UNAVAIL-BIQ) measurement will be pegged when the initial leg of a call encounters a 1B Message Send Buffer overflow or CNI Ring down condition.

- The Unavailable Resource After Initial Query (UNAVAIL-AIQ) measurement will be pegged when the 1B Message Send Buffer overflows or the CNI Ring is down on a leg other than the initial leg of the call.

7. Transition Considerations

Internal Transition Issues

7.01 Users of AIN Global Default Routing for DNT Calls Feature 411 can immediately begin using Feature 415, since both features can reside in the *4ESS* switch and be active at the same time. When both features are active, the Selective Default Routing

parameters are checked first. If this feature is inactive or the AIN Fault Handling parameter indicates final treatment, Feature 411 (if activated) will be used to route the call.

7.02 This special processing is designed to help users of Feature 411 transition to Feature 415. It requires changes only to the triggers that require special treatment (that is, other than what Feature 411 provides). Other individual triggers (such as for routing to the Called Party Number) can be changed at a later time.

Ubiquity

7.03 It is not necessary for this feature to be deployed on all *4ESS* switches in the network to realize feature activation.

Turn On/Turn Off Mechanism

7.04 This feature is turned on or off by the provisioning procedures described in 234-090-019. Contact your AT&T Account Executive for additional information.

8. Input/Output Manual Pages (Not Affected)

Explicit 4-Digit Carrier Identification Indication for Network Traffic Management (NTM) Feature (417)

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Explicit 4-Digit Carrier Identification Indication for Network Traffic Management (NTM) Feature (417)

2

1. Feature Description

1.01 This Local Exchange Carrier (LEC) feature allows network traffic managers using the Netminder/Network Traffic Management (NTM) system to identify which streams of traffic are being affected by control actions that were initiated by the Network Management Display System (NMDS).

1.02 Prior to this feature, the NMDS could not tell if a Manual Call Gapping Control was active on digits that include a 4-digit Carrier Identification Code (CIC). (The CICs were expanded from 3 digits to 4 digits in 4E18.) This problem existed because the interface between the *4ESS*™ switch and the Netminder/NTM system did not explicitly indicate the presence of a 4-digit CIC in the Manual Call Gapping Control data.

1.03 To correct this problem, this feature modifies the *4ESS* switch to Netminder/NTM interface so that the Netminder/NTM system can properly interpret the data received in Data Blocks 44 and 46 Public Announcement System (PAS) with Cut Thru and Call Gapping Data—32 Intervals. The 4-digit CIC (when present) will be sent in Data Blocks 44 and 46. This will allow the Netminder/NTM system to identify the Manual Call Gapping Controls that are active and controlling CICs.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management

5.01 As previously described, the *4ESS* switch will send the 4-digit CIC in Data Blocks 44 and 46 to the Netminder/NTM system. This will allow the Netminder/NTM system to identify the Manual Call Gapping Controls that are active and controlling CICs.

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS* switches in the network to be running the 4E20 Release 2 Generic for this feature to be operational.

Turn On/Turn Off Mechanism

7.02 This feature is turned on automatically with software deployment.

8. Input/Output Manual Pages (Not Affected)

10288 Access to Software Defined Network (SDN) Feature (3857)

3

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10288 Access to Software Defined Network (SDN) Feature (3857)

3

1. Feature Description

1.01 Prior to the incorporation of this feature, switched-access Software Defined Network (SDN) calls arrived at the *4ESS*™ switch on dedicated trunks (10732 access trunks). Calls were identified as SDN calls in the Trunk Subgroup (TSG) data. The 10288 Access to SDN feature allows SDN calls to be routed over 10288 switched-access trunks. Call identification is done by the Automatic Number Identification (ANI) trigger table based on the ANI instead of TSG data.

1.02 In order for the ANI trigger table to be able to identify SDN calls, an SDN indicator had to be added to the ANI trigger table. This was accomplished by the SDN ANI Trigger Table Indicator feature (4355) in the 4E20 Release 1 Generic.

1.03 Figure 3-1 shows the network architecture for the 10288 Access to SDN feature.
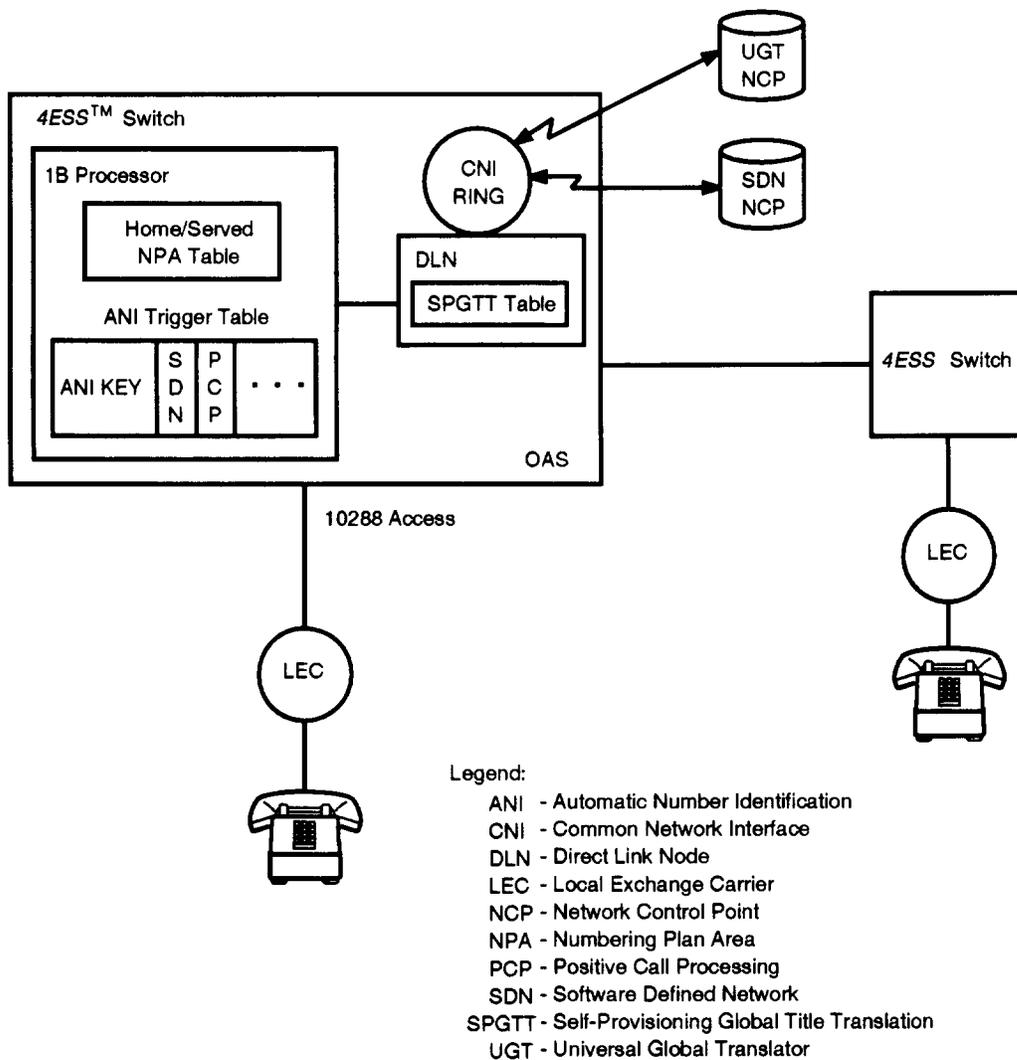
Figure 3-1. 10288 Access to SDN Network Architecture

2. Call Flow

2.01 This section describes the call flow for the 10288 Access to SDN feature.

2.02 When the Originating AT&T Switch (OAS) receives an SDN call from an End Office (EO) over 10288 trunks, the ANI trigger table is searched with the following key:

- 10-digit ANI [sent by the Local Exchange Carrier (LEC) EO]

- Service Type Indicator (Calls that arrive on 10288 access trunks are assigned an "LDS" service type indicator.)

- Access Type (Calls that arrive on 10288 access trunks are assigned a "switched" access type.)

- Numbering Plan Type ("NANP" is assigned to calls that arrive on 10288 access trunks.).

2.03 If a matching ANI record is NOT found in the ANI trigger table, the call is processed as a POTS call. If a matching ANI record is found in the ANI trigger table, the *4ESS* switch checks to see if the SDN Indicator in the ANI data is set.

2.04 If the SDN indicator is not "set", the call is processed as a POTS call. If the SDN indicator is set, the *4ESS* switch performs the following application screening on the call:

- Is the call an 800 dialed number?

- Is the call a translated 800 number call?

- Is the call a 900 dialed number?

- Is the call a 710-NXX-XXXX dialed number?

2.05 If the answer to any of these questions is "yes", the call is not an SDN call, and the applicable call handling procedure is used to process the call. If the answer to all these questions is "no", the call is an SDN call, and the *4ESS* switch checks the SDN office-wide parameter (OD4PF1) to see if "10288 Access to SDN" is allowed.

2.06 If "10288 Access to SDN" is not allowed, the call is processed as a POTS call. If "10288 Access to SDN" is allowed, the call domain is changed to Software Defined Network Access (SDNA).

2.07 The Self-Provisioning Global Title Translation (SPGTT) table in the Direct Link
Node (DLN) is searched for the ANI. If the ANI is not found in the SPGTT table,
the Universal Global Translator (UGT) Network Control Point (NCP) is searched.

2.08 If the ANI is found in the SPGTT table or the UGT database, the ANI is mapped
to a customer ID and the point code of the SDN NCP that contains the customer's
records. A query is sent to the SDN NCP to retrieve the customer's records for
processing the call.

2.09 If the ANI is not found in either the SPGTT table or the UGT database, the call is
processed as a POTS call.

3. Provisioning

3.01 Service Now Routing (SNOWR) will be used for provisioning the SDN ANIs into
the ANI trigger table in the *4ESS* switch.

3.02 A new question was added to the AT&T Service/Call ID Type (ASCIT) table to
support this feature: "Can this call be an SDN call?" The number assigned to this
new question is 2.

3.03 Recent Change (RC) Form 653 is the RC form used to populate the ASCIT table.
Figure 3-2 shows the entries that need to be made on RC Form 653 for the
10288 Access to SDN feature.

```
RC:ASCIT;CHG;_____:

ORNU _____,

SII              QUESTION        ANSWER

   7,               Q2,             Y,
_____,            ___,            __,
_____,            ___,            __,
_____,            ___,            __,
_____,            ___,            __,
_____,            ___,            __,
_____,            ___,            __,
_____,            ___,            __,

REMARKS     _____!
```

Figure 3-2. RC Form 653 Entries Required for 10288 Access to SDN Feature

4. Recording

4.01   A new Revenue Accounting Office (RAO)/Regional Processing Center (RPC) code (046) was created to cover the cases of incorrect or corrupted data in the GTT table/UGT database and the SDN NCP. Records with the new RAO/RPC code will alert the downstream biller that a problem has occurred and steps may need to be taken to correct the bill.

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

7.01   It is not necessary for all *4ESS* switches in the network to be running the 4E20 Release 2 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

7.02   This feature can be turned on and off using Recent Change (RC) Form 809. To turn the feature on, enter **PF1** in the FEATURE ITEM field on RC Form 809 and **ON** in the ON OR OFF field. To turn the feature off, enter **PF1** in the FEATURE ITEM field on RC Form 809 and **OFF** in the ON OR OFF field.

7.03   This feature can also be turned on or off by an absolute word change. Item OD4PF1 in Office Data Assembler (ODA) structure OD4OFCCOPY is the SDN office-wide parameter, which enables and disables the feature.

⚠ CAUTION:
The OD4OFCCOPY structure also contains the on/off bits for many other features. Be certain that the change you make affects only this feature.

7.04 The following is the information needed to turn the feature on or off using an absolute word change:

- Structure: OD4OFCCOPY

- Core address in 4E20 Generic: 6731453

- Size of OD4PF1: 1

- Displacement of OD4PF1: 0

- On: 1

- Off: 0

8. Input/Output Manual Pages

8.01 The VER:ASCIT input and output manual pages were modified to support this feature. Question 2, "Can this be a SDN call?", was added to Table B on the input manual page and to Table A on the output manual page.

ID . . . . VER:ASCIT
WORK CENTER . . MAC, MOC
GENERIC . . . . . . 4E20 Rel. 2 and later
CLASS . . . . VER
APPLICATION . . 4E
TYPE . . . . Input

1. PURPOSE

Request the verification of the AT&T service/call ID type (ASCIT).

2. FORMAT

VER:ASCIT:[**SII** a],[**QRYTYPE** b]!

3. EXPLANATION OF MESSAGE

a   Service identity index (**SII**) number (0-255).

b   Question being asked (**QRYTYPE**) number (1-48). See Table B for a list of questions that can be asked and the corresponding field input.

         NOTE: See Table A for valid input entries.

4. SYSTEM RESPONSE

?I,INV KW   An invalid keyword was specified for the **VER:ASCIT** input message.

PF   Printout follows.

5. REFERENCES

PIDENTs
  IOCPIMC4
  VRFYCNTL
  VRFYINPT
  VRFYMISC

Output Message
  VER:ASCIT-ANSR

TABLE A

SII	QRYTYPE	VALID ENTRIES	COMBINATIONS
Y	N	SII = 0-255	(single, range, list)
N	Y	QRYTYPE = 1-48	(single, range, list)
Y	Y	SII = 0-255	(single, range, list)
Y	Y	QRYTYPE = 1-48	(single)

TABLE B

VALUE	MEANING
1	Is this a global software defined network (SDN) call?
2	Can this be a SDN call?
3	Currently not used
4	Should the universal services echo canceler (USEC) enhancement feature be disabled for this SII?
5	Is this a remote adjunct call handling (REACH) call for this SII?
6	Should the billing number be sent with this SII?
7	Is this an SDN - digital radio avoidance routing (DRAR) call?
8	Is this a hand-off type of feature?
9	Is this a GETS call?
10	Are end-to-end class of service (ECOS) overflow routes excluded for this SII?
11	Are ECOS alternate routes excluded for this SII?
12	Is this a HIQ call for this SII?
13	Is the terminating recording data set to ON for this SII?
14	Is this a Megacom® 800 call for which we need to check if going to and interexchange carrier?
15	Will a transmit negative rail (TNR) "Start of Call" order be sent for the egress trunk for this SII?
16	Shoul the access information and/or trunk group rating number be included in the IAM for this SII?
17	Is forced via switch routing (FVSR) / CSRO to be used to route calls?
18-48	Currently not used

ID . . . . VER:ASCIT-ANSR
WORK CENTER. . MAC, MOC
GENERIC . . . . . . 4E20 Rel. 2 and later
APPLICATION . . 4E
TYPE . . . . Output

1. FORMAT

```
VER:ASCIT;OPT(ANSR):

SII    QUESTION    ANSWER

 a        b          c
```

2. REASON FOR OUTPUT

Display the verification of the AT&T service/call ID type (ASCIT).

3. VARIABLE FIELD DEFINITIONS

a   Service identity index (SII) number (0-255).

b   Question being asked number (1-48). See Table A for a list of questions that could be asked and the corresponding question number.

c   Answer to question:

N — No
Y — Yes

4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENTs
  IOCPIMC4
  IOCPPVR4
  VRFYCNTL
  VRFYINPT
  VRFYMISC
  VRFYOUT

Input Message
  VER:ASCIT

TABLE A

VALUE	MEANING
1	Is this a global software defined network (SDN) call?
2	Can this be a SDN call?
3	Currently not used
4	Should the universal services echo canceler (USEC) enhancement feature be disabled for this SII?
5	Is this a remote adjunct call handling (REACH) call for this SII?
6	Should the billing number be sent with this SII?
7	Is this an SDN - digital radio avoidance routing (DRAR) call?
8	Is this a hand-off type of feature?
9	Is this a GETS call?
10	Are end-to-end class of service (ECOS) overflow routes excluded for this SII?
11	Are ECOS alternate routes excluded for this SII?
12	Is this a HIQ call for this SII?
13	Is the terminating recording data set to ON for this SII?
14	Is this a Megacom® 800 call for which we need to check if going to and interexchange carrier?
15	Will a transmit negative rail (TNR) "Start of Call" order be sent for the egress trunk for this SII?
16	Shoul the access information and/or trunk group rating number be included in the IAM for this SII?
17	Is forced via switch routing (FVSR) / CSRO to be used to route calls?
18-48	Currently not used

End-to-End Class-of-Service (ECOS)—Circuit Selection Capability Feature (4018a)

4

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End-to-End Class-of-Service (ECOS)—Circuit Selection Capability Feature (4018a)

4

1. Feature Description

1.01 This feature is an enhancement to the End-to-End Class-of-Service (ECOS) feature, which was introduced in the 4E20 Release 1 Generic. The ECOS feature is an extension of the Class-of-Service (COS)/Real Time Network Routing (RTNR) feature, which converted the intertoll network to a fully-integrated, multi-service network. ECOS extends the COS/RTNR capabilities to the egress/ingress portion of the AT&T switched network.

1.02 Prior to the incorporation of this feature, ECOS selected an egress route at an International Switching Center (ISC) or gateway switch by applying trunk reservation controls similar to those developed for RTNR. The first available Trunk Subgroup (TSG) from the TSG list was selected, which is the normal trunk selection process. For some services, this is no problem because the circuit characteristics of the TSG that carries the call are not important. For other services, however, it is very important. This feature enhances the trunk selection process by adding the capability to select a TSG with specific circuit characteristics. The capability is referred to as the circuit selection capability.

1.03 With the Circuit Selection Capability feature, services such as International Long Distance Service (ILDS), International 800 (I800) Service Outbound, Switched Digital International (SDI), Global Software Defined Network (GSDN) Outbound, etc., can specify the circuit characteristics of the TSG that will handle the call.

1.04 The Circuit Selection Capability feature allows for up to 16 different circuit characteristics. Initially, the following 7 characteristics are included in the feature:

- Integrated Services Digital Network User Part (ISUP) Signaling

- Satellite

- Operator Hardware Equipped

- Operator Reachable Within the Area

- Advanced Fax Circuits

- Digital Compression Equipment

- Fiber Circuits

1.05 Some services could be routed by TSGs with several different circuit characteristics. If given a choice, however, a TSG with certain circuit characteristics would probably be preferred over another. Therefore, in addition to being able to select the circuit characteristics of a TSG, a "preference level" can also be specified for each Service Identity (SI). The Circuit Selection Capability feature supports the following four "preference levels":

- Required

- 1st Preference

- 2nd Preference

- Don't Care

1.06 ECOS does not require separate Routing Data Blocks (RDBs) to support circuit selection capabilities. Instead, TSGs in ECOS route lists are marked through Recent Change to indicate which of the critical capabilities they support. Each TSG in the route is labeled with the Transport Capabilities (TCs) and circuit selection capabilities that it supports. ECOS trunk hunt contains logic that lets it skip those TSGs which do not have the desired capabilities or which have undesired characteristics and to seek a "best match" for the requirements of a call.

2. Call Flow

2.01 The following steps are a high level description of the outgoing ECOS call flow that includes the determination of the circuit selection capability preference levels.

1. Digit translation determines that the call has an RDB or Multiple Routing Treatment (MRT) calltype.

2. If the RDB or MRT identified by the calltype word is associated with an active ECOS AREA, outgoing trunk selection invokes ECOS trunk hunt.

3. COS information for the call is mapped to an ECOS Routing Pattern Identity (ERPI) parameter.

4. The destination AREA is used to determine the alternate and overflow routes.

5. Circuit selection capability preference levels are determined for the call.

6. An ECOS route is derived from the Multiple Routing Treatment Table (MRTT) (or RDB) and the ECOS Route List.

7. A trunk in the route is seized.

8. The load status measurements for the selected route are adjusted.

9. The Calls In Progress (CIP) count for the ERPI and destination area of the call is incremented.

10. When the call disconnects, the load status information for the route is updated, and the CIP count is decremented.

3. Provisioning

Data Structures

3.01 A new 1-level 1K structure, HT4ECS_SICS, has been defined in Protected, Simplex, Disk-backed Office Data (PSBO) memory. This structure maps service identity to a capability set preference level.

Recent Change (RC) Forms Affected

3.02 A new RC form, 528, was created to populate the Service Identity Index (SII) to Circuit Selection Capability preference level mapping. Figure 4-1 shows this new RC form.

```
RC:ECOS;CHG;OPT(SIICSC)____:              SII ____,

ORNU _____,

      CSC          P/A          PREF

      _____,      _,           ___,
      _____,      _,           ___,
      _____,      _,           ___,
      _____,      _,           ___,
      _____,      _,           ___,
      _____,      _,           ___,
      _____,      _,           ___,
      _____,      _,           ___,
      _____,      _,           ___,
      _____,      _,           ___,
      _____,      _,           ___,
      _____,      _,           ___,

REMARKS _____,
```

Figure 4-1. SII To Circuit Selection Capability Preference Mapping (RC Form 528)

A. Population Rules for RC Form 528

3.03 This section defines the entries that can be made on RC Form 528. Refer to Figure 4-1 as you read this section.

3.04 Valid entries for SII are 1-255.

3.05 Valid entries in the CSC (Circuit Selection Capability) column are CSC1 to CSC16. Table 4-A contains definitions of the circuit selection capabilities.

Table 4-A. Circuit Selection Capabilities

Valid Entries	Definition
CSC1	OPERH–Operator Hardware Equipped
CSC2	OPER1–Operator Reachable within AREA
CSC3	FAX–Advanced Fax Circuits
CSC4	FIBER–Fiber Circuits
CSC5	DCME–Digital Compression Equipment
CSC6	Spare
CSC7	Spare
CSC8	Spare
CSC9	Spare
CSC10	Spare
CSC11	Spare
CSC12	Spare
CSC13	Spare
CSC14	Spare
CSC15	ISUP–ISDN User Part
CSC16	SAT–Satellite

3.06 Entries in the P/A column specify whether the circuit characteristic is or is not desired. Valid entries are **P** (presence) or **A** (absence). For example, an entry of **P** on the same line as CSC16 (SAT) indicates that a TSG with satellite capabilities is desired, and an entry of **A** indicates that a TSG without satellite capabilities is desired.

3.07 The PREF column allows for the selection of the preference level of the circuit characteristic. There are four valid entries for the PREF column:

- RQ (Required)—The call may only be routed on trunks having the circuit selection capabilities corresponding to the stated characteristics.

- PF1 (1st Preference)—An attempt will be made to route the call on a trunk with the stated circuit selection capabilities. If this is not possible, the call may be routed on a trunk without the stated circuit selection capabilities.

■ PF2 (2nd Preference)—An attempt will be made to route the call on a trunk with the stated circuit selection capabilities. If this is not possible, the call may be routed on a trunk without the stated circuit selection capabilities. 1st-Preference circuit selection capabilities are given higher priority than 2nd-Preference circuit selection capabilities. Therefore, if only one or the other can be obtained, trunks supporting the 1st-Preference circuit selection capabilities will be used first.

■ DC (Don't care)—The circuit selection capabilities are not considered when selecting a trunk.

3.08 To show how the circuit selection capability, presence/absence, and preference level relate to each other, consider the example of the satellite circuit selection capability (CSC16) again. If a **P** is entered in the P/A column and **RQ** is entered in the PREF column, it means the TSG that is selected must have satellite capabilities. If an **A** had been entered in the P/A column, it would mean that a TSG must NOT be selected that has satellite capabilities. The prefence levels PF1 and PF2 indicate the degree to which the circuit characteristic is desired. If a **PF1** is entered in the PREF column, it means that it is not necessary to select a TSG that has satellite capabilities; however, a TSG with satellite capabilities is preferred over a TSG without satellite capabilities.

B. Populated RC Form 528

3.09 Figure 4-2 is an example of entries that could be made on RC Form 528 for circuit selection preferences for a given SII.

```
RC:ECOS;CHG;OPT(SIICSC)____:                    SII 100,

ORNU 1,

        CSC          P/A          PREF

        CSC3,         P,           RQ,
        CSC4,         -,           DC,
        CSC5,         A,           PF2,
        CSC15,        P,           PF1,
        CSC16,        A,           RQ,
        _____,      _,           ___,
        _____,      _,           ___,
        _____,      _,           ___,
        _____,      _,           ___,
        _____,      _,           ___,
        _____,      _,           ___,


REMARKS    _____:
```

Figure 4-2. Sample Populated RC Form 528

3.10 The following is an interpretation of the entries made on RC Form 528:

Line 1 (CSC3)	A TSG with advanced Fax circuits is required.
Line 2 (CSC4)	It does not matter whether a TSG with fiber circuits is used.
Line 3 (CSC5)	A TSG that does NOT have digital compression equipment is preferred over a TSG that does.
Line 4 (CSC15)	ISUP signaling is preferred but not required. And when selecting a TSG, a TSG with ISUP signaling is preferred (PF1) over a TSG that does not have digital compression equipment (PF2).
Line 5 (CSC16)	This call must NOT be routed via satellite.

3.11 For additional information on completing RC Form 528, see the *4ESS*™ Switch Translation Guide (TG-4).

Verify Forms Affected

3.12 A new argument, SIICSC, was defined for Verify Form 15j.

3.13 A new verify output form, 5r, was created to support this feature.

4. Recording (Not Affected)

5. Network Management

5.01 A new Network Management Operations Support System (NEMOS) message, message type 91, was created to support this feature. NEMOS can use this message to request a report of the mapping from SI to circuit selection capability preference levels from a *4ESS* switch.

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS* switches in the network to be running the 4E20 Release 2 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

7.02 RC Form 528 is used to turn this feature on and off. Refer to "Provisioning" for details on populating RC Form 528.

7.03 To turn the feature off, set all the preference levels for an SII to DC (Don't Care).

8. Input/Output Manual Pages

8.01 The VER:ECOS input message was modified. A new format was added to request an output of the service identity to circuit selection capability preference mapping.

8.02 A new output message, VER:ECOS-SIICSC, was created to display the preference levels of the circuit selection capabilities for a given SII.

ID . . . . VER:ECOS
WORK CENTER . . MAC, MOC
GENERIC . . . . . . 4E20 Rel. 2 and later
CLASS . . . . VER
APPLICATION . . 4E
TYPE . . . . Input

1. PURPOSE

Request the verification of end-to-end class of service (ECOS) data. Format 1 lists the alternate or overflow route list. Format 2 lists the activation status of areas. Format 3 lists preference levels of circuit selection capabilities for a specified service identity index.

2. FORMAT

[1] **VER:ECOS AORL:AREA** a[**,TPC** b][**,TYPE** c]!

[2] **VER:ECOS AREALIST:AREA** {a|**ALL**}!

[3] **VER:ECOS SIICSC:SII** d!

3. EXPLANATION OF MESSAGE

AORL	Alternate/overflow route list.
AREALIST	Activation status of areas.
SIICSC	Service identity index (SII) circuit selection capability preference levels.
a	Area name. (1-12 alphanumeric characters)
b	Transport capabilities:
	VOICE — Voice traffic.
	C64 — Clear 64 kilobits per second (kbps) data.
	C384 — Clear 384 kbps data.
	C1536 — Clear 1536 kbps data.
c	Route type:
	ARL1 — Alternate route list grade 1.
	ARL2 — Alternate route list grade 2.
	ORL1 — Overflow route list grade 1.
	ORL2 — Overflow route list grade 2.
ALL	List activation status for all area names.
d	Service identity number (1-255).

4. SYSTEM RESPONSE

NA   Not accepted.

PF   Printout follows.

5. REFERENCES

PIDENTs
 IOCPIMC4
 VRFYECOS
 VRFYCNTL
 VRFYINPT

Translation Guide, 4ESS^{TM}, PTG-4, Division 8 Section 15j

Output Messages
  VER:ECOS-AREALIS
  VER:ECOS-AORL
  VER:ECOS-SIICSC

ID . . . . VER:ECOS-SIICSC
WORK CENTER . . MAC, MOC
GENERIC . . . . . . 4E20 Rel. 2 and later
APPLICATION . . 4E
TYPE . . . . Output

1. FORMAT

```
VER:ECOS;OPT(SIICSC);                    SII a,

    CSC        P/A        PREF
     b,         c,         d,
      .          .          .
      .          .          .
      .          .          .
```

2. REASON FOR OUTPUT

To display the preference (PREF) levels of circuit selection capabilities (CSC) for an input service identity index (SII).

3. VARIABLE FIELD DEFINITIONS

a   Service identity index (1-255).

b   Circuit selection capability (CSC1 - CSC16).

c   Preference level indicator:

A   — Absence.

P   — Presence.

d   Preference level:

PF1 — First preference.

PF2 — Second preference.

RQ   — Required.

4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENTs
  IOCPIMC4
  IOCPMCP4
  IOCPPVR4
  VRFYCNTL
  VRFYECOS
  VRFYINPT
  VRFYOUT

Input Message
VER : ECOS

Multiple *4ESS*™ Switch Network Announcements—Phase 2 Feature (4232a)

5

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Multiple *4ESS*™ Switch Network Announcements—Phase 2 Feature (4232a)

5

1. Feature Description

1.01 The Multiple *4ESS*™ Switch Announcements feature, introduced in the 4E18 Release 3 Generic, enabled the *4ESS* switch to give final handling treatments and service terminating announcements in different languages based on the location of the caller. That capability is required for all services being offered in Canada on the *4ESS* switch platform. Four versions of each announcement are available: English only, English followed by French, French followed by English, and French only.

1.02 Phase 2 of the Multiple *4ESS* Switch Network Announcements feature provides new recent change procedures for implementing this feature in 4E20 Release 2 and later generics.

2. Call Flow (Not Affected)

3. Provisioning

Structures Affected

3.01 Two new 2-bit items in the original Multiple *4ESS* Switch Network Announcements feature are recent changeable in 4E20 Release 2 and later generics. Those items are Numbering Plan Area Announcement Group (NPAAG,

later changed to NPAG) and Service Support System Announcement Group (SSSAG, later changed to SSSG). In each case, the following announcement group numbers apply:

- Group 0   English only
- Group 1   English/French
- Group 2   French/English
- Group 3   French only

Recent Change (RC) Forms Affected

A. RC Form 319

3.02 Where the DIGTYPE is NPAG or SSSG, the RDIG field on Recent Change Form 319 must be populated with a value from 0 to 3, corresponding to the announcement groups specified in "Structures Affected." See Figure 5-1.

```
RC:CODEGRP;NEW;OPT(DIGTYP),____:          DIGTYP_____, RDIG_,

ORNU _____,

DIG  DIG  DIG  DIG  DIG  DIG  DIG  DIG

___, ___, ___, ___, ___, ___, ___, ___,

___, ___, ___, ___, ___, ___, ___, ___,

___, ___, ___, ___, ___, ___, ___, ___,

___, ___, ___, ___, ___, ___, ___, ___,


REMARKS _____,
```

Figure 5-1. Recent Change Form 319

Verify Forms Affected

A. Verify Form 13d

3.03 Where the DIGTYPE is NPAG or SSSG, the RDIG field must be populated with a value from 0 to 3, corresponding to the announcement groups specified in "Structures Affected."

B. Verify Form 3h

3.04 If a DIGTYPE entry of NPAG or SSSG is entered, the Verify output must identify any data where the input DIGTYP/RDIG values match those in translations.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

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

Turn On/Turn Off Mechanism

7.02 Refer to "Provisioning" in this chapter for information about provisioning the switch to use this feature.

8. Input/Output Manual Pages (Not Affected)

Software Defined Data Network—International for Unitel Feature (4275)

6

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Software Defined Data Network—International for Unitel Feature (4275)

6

1. Feature Description

1.01 The Software Defined Data Network—International (SDDN-I) for Unitel feature is an enhancement to the SDDN-Canada service. The SDDN-Canada service is part of a joint venture between AT&T and Unitel Communications of Canada. SDDN-Canada provides circuit-switched digital data service to customer locations within Canada and the United States. The SDDN-I for Unitel feature allows Unitel to offer outbound and inbound international data calls as part of Unitel's SDDN-Canada/VRoute II data service. VRoute II is a domestic Canadian Virtual Private Network (VPN) service that is offered by Unitel. With SDDN-I, a Unitel customer can now place data calls to and receive data calls from customers outside Canada and the United States (referred to as international calling). Unitel international data calls are routed through Teleglobe, which is the international carrier for Canada. Teleglobe's transport capability supports 56-Kbps and 64-Kbps Clear data rates.

1.02 SDDN-I for Unitel has connections to all foreign administrations (carriers) with whom Teleglobe has agreements to route circuit-switched digital data calls. Where Teleglobe only supports 56-Kbps service, only 56-Kbps service is available. For countries where Teleglobe has agreements with several carriers, Unitel must be able to identify the appropriate carrier and pass this information to Teleglobe when the call is being routed. Unitel also has the option of using Teleglobe's default allocation of calls among foreign carriers. The default allocation of calls among foreign carriers is derived by the Foreign Administration Identifier (FAI).

1.03 This feature is proprietary to AT&T. The *4ESS*™ switch capabilities developed for this feature are per an agreement between AT&T and Unitel Communications of Canada.

2. Call Flow

Call Flow Key Points

2.01 Outbound international data calls originate from Canada and terminate at a customer location outside Canada and the United States. These calls are dialed as Virtual On-Net or Off-Net and are routed to Teleglobe as Off-Net in the following format:

Country Code + National Number (CC+NN)

2.02 Inbound international data calls originate from a country other than Canada and the United States and terminate at a customer location inside Canada. For an inbound international call, Unitel identifies the data rate (56-Kbps versus 64-Kbps Clear) that is requested by the far-end caller. If Teleglobe cannot accurately provide the data rate, Unitel will determine the data rate based on the 600 number that was dialed. Unitel will then translate the 600 number and route the call to the direct-connect customer location. Inbound international data calls are routed from Teleglobe to Unitel using a 600 number in the following format:

600-NXX-XXXX

2.03 Routing between Canada and foreign countries (other than the United States) is via Teleglobe.

⇒ **NOTE:**
The capabilities introduced by this feature support routing digital data calls from Unitel to AT&T, but additional capabilities are required for AT&T to fully support bypassing Teleglobe. However, no attempt will be made at this time to bypass Teleglobe and route calls through the AT&T network.

2.04 Routing between Unitel and Teleglobe uses connections between one or both Unitel *4ESS* switches [that is, Aldergrove and Toronto (Markham)] and one or more Teleglobe switches. The SDDN-I feature allows Unitel to route calls destined for any foreign country to Teleglobe from either of the two Unitel *4ESS* switches.

2.05 The originating *4ESS* switch performs Carrier Specific Routing (CSR) for outbound international data calls in a non-Real Time Network Routing environment. CSR is accomplished by using Route Selection Identity (RSI) screening, Multiple Carrier Treatment (MCT) screening, and a query to the AT&T Switched Digital International (SDI) CSR database. These capabilities exist currently in the *4ESS* switch but have not been utilized in the AT&T network.

2.06 Unitel SDDN-Canada customers are assigned 600 numbers so that they can receive calls from off-net locations. Teleglobe is responsible for routing calls dialed to 600 numbers to Unitel based on the 600-NXX allocated to Unitel.

2.07 For inbound international calls, the originating Unitel *4ESS* switch must analyze the dialed 600 number to determine adequately the bearer capability (transport data rate) requested by a foreign caller. For example, if a 600 number call comes in from Teleglobe, and the following conditions are true:

- Type of Trunk (**TOT**) is Local Carrier Connecting (**LCC**),

- Far-End Network Classification (**FENCLASS**) is International (**INTL**),

- User Service Information (USI) parameter in the Integrated Services Digital Network (ISDN) User Part (ISUP) Initial Address Message (IAM) indicates "Unrestricted", and

- the 600 number translates to a "DSD" (Direct Service Dialing) call type,

then the dialed 600 number must be analyzed before the Transaction Capabilities Application Part (TCAP) query is sent to the Network Control Point (NCP) database. If the 600 number is in the format of 600-86X-XXXX, the bearer capability should be set to 56 Kbps. If the 600 number is in any other format, the bearer capability should be set to 64 Kbps. Once the bearer capability has been administered, the correct bearer capability will be sent to the NCP and also in subsequent ISUP messages.

2.08 Each 600 number is translated to an Action Point Numbering (APN) routing number in the Switched Digital Service (SDS) NCP. The 600 numbers are provisioned in the SDS NCP by the SDS Service Management System (SMS).

2.09 With Common Channel Signaling System 7 (CCS7) ISUP Network Interconnect and Intertoll CCS7 ISUP signaling, the Called Party Number parameter may contain a maximum of 18 digits. For some countries, the CC+NN number may contain up to 15 digits.

Call Flow Diagrams

A. Outbound International Call

2.10 The call flow diagram for an outbound international call is shown in Figure 6-1. This call flow depicts a call from Canada to a location outside Canada and the United States. The initial portion of the call, including the query to and response from the Software Defined Network (SDN) NCP, is handled the same as for a Phase 1 SDDN-Canada call.
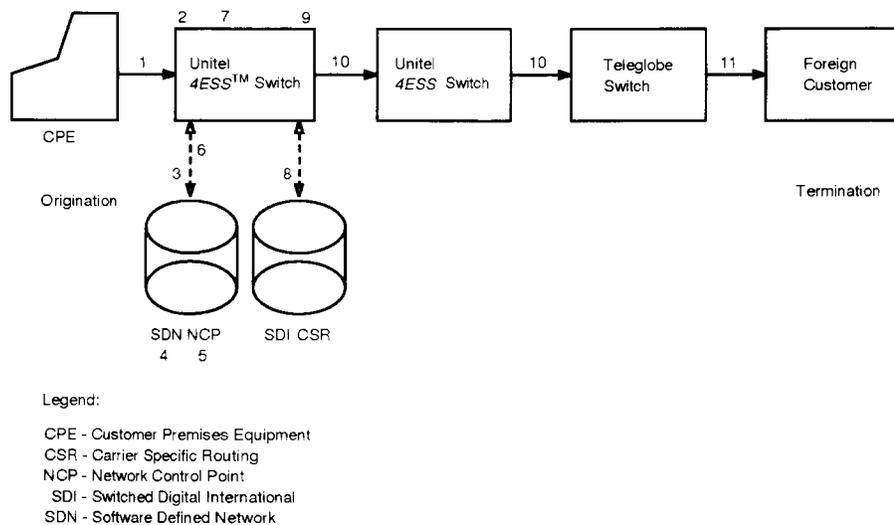
Figure 6-1. Outbound International Call Flow

2.11 The call flow for an outbound international call as depicted in Figure 6-1 is described as follows:

1. Depending on the type of access, a caller dials either a 7-digit private number, a North American Numbering Plan (NANP) number, or a CC+NN number. See Table 6-A for the types of access and their related dialing options.

2. The call arrives at the originating Unitel *4ESS* switch in the Software Defined Network Access (SDNA) domain.

3. Based on the translation of the dialed number, the originating Unitel *4ESS* switch determines if a TCAP query to the SDN NCP is required. If a query is required, the *4ESS* switch sends a TCAP **BEGIN** message to the SDN NCP.

4. When the SDN NCP receives the TCAP **BEGIN** message, it determines which customer record is affected based on the 10-digit customer identification (ID) number or by accessing the Automatic Number Identification (ANI) Translation Table with the ANI to determine the SMS customer ID number. The call is then screened to determine if the caller is allowed to call the dialed number.

5. If the call is allowed and the dialed number is a 7-digit private number, the 7-digit dialed number is translated to an NANP number or a CC+NN number and returned as the routing number to the originating *4ESS* switch. If the originally dialed number is an NANP number or a CC+NN number, there is no translation. The dialed number becomes the routing number. Also, the Supplemental Routing Information (SRI) service ID is set to "SDI Outbound."

Table 6-A. Access Types and Dialing Options

Access Type	Dialing Options
Static	7-digit private number [Virtual On-Net (VON)]
	NPA-NXX-XXXX (NPA = Numbering Plan Area) International World Zone 1 (IWZ1) only NPA = 809
	011 + CC + NN non-World Zone 1 (non-WZ1)
Dynamic—Feature Code	115 + 7-digit VON
Dynamic—Station Group Designator (SGD)	7-digit VON + SGD
	NPA-NXX-XXXX + SGD IWZ1 only; NPA = 809
	011 + CC + NN + SGD non-WZ1
ISDN Primary Rate Interface (PRI)	7-digit VON
	NPA-NXX-XXXX Nature of number = National IWZ1 only; NPA = 809
	CC + NN Nature of number = International non-WZ1

6. If the call is allowed, the SDN NCP formulates a TCAP **END** message to the originating *4ESS* switch to start a billing record and connect the call.

7. When the originating *4ESS* switch receives the TCAP **END** message, this triggers Automatic Message Accounting (AMA) recording, and the Class-Of-Service (COS) parameters for the call are derived.

⇒ **NOTE:**
If the SRI service ID is SDI Outbound, then the Service Identity (SI) is SDI Outbound. If the SRI service ID is SDI CSR, then the SI is SDI CSR. Otherwise, the SI is derived as SDN or SDS.

The originating switch then begins processing the routing number.

If the type of call is International World Zone 1, Non-World Zone 1—No CSR, or Non-World Zone 1—Global SDN (GSDN) CSR, continue with Step 10. If Non-World Zone 1—SDI CSR, continue with Step 8.

8. The originating *4ESS* switch sends a TCAP **BEGIN** message to the SDI CSR database. Based on the routing number, the SDI CSR database determines the appropriate carrier and returns an FAI to the originating *4ESS* switch.

9. The originating *4ESS* switch receives a TCAP **END** message from the SDI CSR database.

10. The originating *4ESS* switch routes the call based on several options as follows:

   ■ If a Routing Data Block (RDB) is selected as the Call Type (CALL TYPE=RDB), the switch routes the call to its destination.

   ■ If an RDB with trunks to Teleglobe is selected, the originating switch prefixes a Carrier ID to the call (if necessary) and routes the call to Teleglobe.

   ■ If an RDB with trunks to the other Unitel *4ESS* switch is selected, the originating *4ESS* switch routes the call to the other (terminating) Unitel *4ESS* switch. After the terminating switch translates the Country Code (CC) and does screening, the terminating switch then selects an RDB with trunks to Teleglobe and routes the call to Teleglobe.

   ■ If Final Handling Treatment (FHT) is selected as the Call Type (CALL TYPE=FHT), the originating *4ESS* switch terminates the call.

⇒ **NOTE:**
If a call is destined to a country to which Unitel does not provide circuit-switched digital data service, the Country Code (CC) will not be populated in the translation. In this case, the *4ESS* switch will apply the default FHT for vacant codes.

11. Teleglobe routes the call to the terminating carrier based on the Carrier ID specified (if supplied). The terminating carrier then routes the call to the terminating customer location (foreign customer destination).

B. Inbound International Call

2.12 The call flow diagram for an inbound international call is shown in Figure 6-2. This call flow depicts a call to Canada from a country outside Canada and the United States.

Legend:

CPE - Customer Premises Equipment
NCP - Network Control Point
SDS - Switched Digital Service
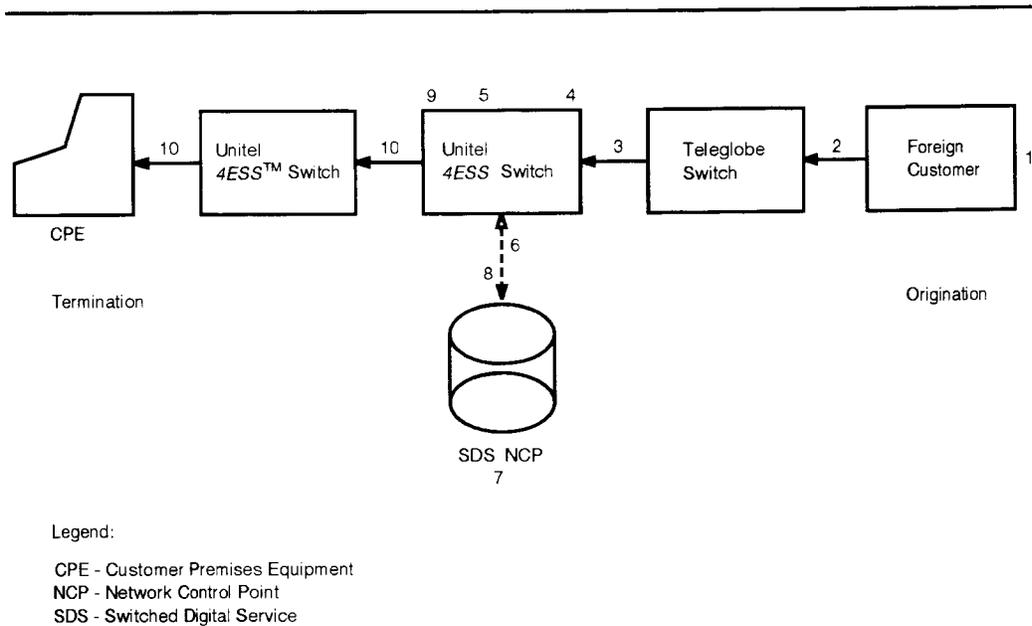
tpa 786780/01

Figure 6-2. Inbound International Call Flow

2.13 The call flow for an inbound international call as depicted in Figure 6-2 may be described as follows:

1. The caller dials either 600-64X-XXXX or 600-86X-XXXX.

    ⇒ **NOTE:**
    For inbound international data calls to Unitel, only 600 numbers are supported for switched digital data. Digital data calls dialed using NANP numbers are routed by Teleglobe through Stentor to the local telephone company.

2. Based on the 600 number, the foreign carrier routes the call to Teleglobe.

3. Based on the 64X or 86X value assigned to Unitel, Teleglobe routes the call to the Unitel *4ESS* switch.

4. The originating Unitel *4ESS* switch receives the call in Domain 82. Either of the two Unitel switches may receive the call. Determining which Unitel switch receives the call depends on the type of signaling between Unitel and Teleglobe and the bearer capability rate (56-Kbps or 64-Kbps Clear).

➡ NOTE:
> Since knowledge of the actual data rate requested by the caller (56-Kbps or 64-Kbps Clear) may be lost in the foreign network or the Teleglobe network, and if CCS7 ISUP signaling is used between Teleglobe and Unitel, the originating *4ESS* switch must derive the data rate based on the dialed number. Based on the NXX value, the originating *4ESS* switch sets the data rate to 56-Kbps or 64-Kbps Clear. If MF signaling is used, the originating *4ESS* switch sets the data rate to 56 Kbps based on incoming Trunk Subgroup characteristics.

5. Considering the translation of the 600 number in Domain 82, the originating *4ESS* switch sends a query to the SDS NCP database. Depending on the SDS architecture being used, the originating *4ESS* switch may perform either the existing Dialed Number-based query to a DSD NCP or the new ANI-based query to a Digital Switched Access (DSA) NCP. In either case, the originating *4ESS* switch formulates a TCAP **BEGIN** message.

➡ NOTE:
> Global Title Translations (GTT) will be performed on 600 numbers the same way it is currently being performed on 700 numbers. Currently, the No. 2 Signaling Transfer Point (2STP) performs 6-digit GTT on the 700 numbers. So it is expected that the Unitel 2STP will do GTT on the 600 numbers to properly route the TCAP **BEGIN** message to the SDS NCP.

6. The originating Unitel *4ESS* switch sends the TCAP **BEGIN** message to the SDS NCP that contains the customer record.

7. The SDS NCP receives the TCAP **BEGIN** message and processes the call. The SDS NCP locates the Call Processing Record based on the dialed 600 number. The SDS NCP then translates the 600 number to an APN or NANP routing number.

8. The SDS NCP formulates a TCAP **END** message and sends it to the originating *4ESS* switch.

9. The originating *4ESS* switch receives the TCAP **END** message and routes the call. The call is routed with the APN routing number in the Dedicated Egress Data (DED) Domain or the NANP routing number in Domain 82. If the originating *4ESS* switch is not also the terminating *4ESS* switch, the originating switch routes the call to the other Unitel *4ESS* switch.

10. The terminating *4ESS* switch then routes the call to the terminating customer location inside Canada.

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

7.01 Deployment is required at the two Unitel switches, Aldergrove and Toronto (Markham).

Turn On/Turn Off Mechanism

7.02 This feature is turned on automatically by software deployment.

8. Input/Output Manual Pages (Not Affected)

Generic Indicators in Tracer Records Feature (4314)

7

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Generic Indicators in Tracer Records Feature (4314)

7

1. Feature Description

1.01   Tracer records are Automatic Message Accounting (AMA) records placed as markers in the stream of AMA records on an hourly basis to provide aggregate counts of the number of AMA records transmitted between successive markers. There are several tracer records, and most contain a field called the AMA Sequence Number (AMA Table 140).

1.02   Before the introduction of this feature, the *4ESS*™ switch used as the value in the AMA Sequence Number field the latest 1A/1B generic that the 3B Attached Processor System (APS) could work in conjunction with, while the Call Detail Recording Platform (CDRP) used the generic that the switch was actually running on at the time.

1.03   As a result, the values could be inconsistent, since each APS generic is capable of working in conjunction with two 1A/1B generics. For example, AP13 can work in conjunction with both 4E18/19 and 4E20. Therefore, when the 3B APS was on AP13 and the *4ESS* switch was on 4E19, the value of the AMA Sequence Number in the switch would be 02000 while that in the CDRP would be 01900.

1.04   The Generic Indicators in Tracer Records feature redefines the values that can be assigned in this table, with the benefit of standardizing the values for the CDRP and the switch.

1.05   With this feature, the AMA Sequence Number indicates which version of the software is loaded in the *4ESS* switch 1B Processor and the 3B APS. The information will include the generic, the release, and (where applicable) the 1B Generic Gulp.

1.06 Another benefit of this feature is that it provides the Network Recording Management (NRM) Work Center a clearer view of software changes in the *4ESS* switch.

1.07 The new layout for Table 140, AMA Sequence Number, is explained in Table 7-A.

Table 7-A. Table 140—AMA Sequence Number

Binary Coded Decimal (BCD) Characters	Meaning
1	Least Significant Digit of Current 1B Generic
2	Current 1B Generic Point Release
3	Least Significant Digit of Current 1B Generic Gulp
4	Least Significant Digit of Current 3B APS Generic
5	Current 3B APS Point Release
6	SIGN (Hex C)

1.08 This feature is for all AT&T and UNITEL *4ESS* switches and all CDRPs. It cannot be used by Local Exchange Carrier (LEC) switches because it is incompatible with their billing.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording

4.01 Several tracer records are affected by this feature. Table 7-B shows the tracer records produced by the *4ESS* switch, while Table 7-C shows the tracer records produced by the CDRP. In both tables, the "AMA Sequence Number" column indicates whether or not the record contains an AMA Sequence Number.

Table 7-B. 4ESS™ Switch Tracer Records

Tracer Name	Structure Code	AMA Sequence Number?
Logical Data Set Header	00422	Yes
Logical Data Set Trailer	00423	No
Beginning of Recording	09036	No
End of Recording	09037	No
Logical Data Set Header	09038	Yes
Logical Data Set Trailer	09039	No
Primary AMA Teleprocessing System (TPS) Tracer	09042	Yes
Secondary AMATPS Tracer	09043	Yes
Call Assembly Tracer	09048	Yes
Deferred Formatting Tracer	09060	Yes
Service Count Tracer	09915	Yes
REmote Adjunct Call Handling (REACH) Tracer	09923	No

Table 7-C. CDRP Tracer Records

Tracer Name	Structure Code	AMA Sequence Number?
Logical Data Set Header	00422	Yes
Logical Data Set Trailer	00423	No
Beginning of Recording	09036	No
End of Recording	09037	No
Service Count Tracer	09916	Yes
Lost Category Tracer	09917	Yes
Call Assembly Tracer	09918	Yes
Call Detail Recording (CDR) Data Tracer	09919	Yes
Data Latency Tracer	09920	Yes
Primary TPS Tracer	09921	Yes
Secondary TPS Tracer	09922	Yes
REACH Tracer	09923	No

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

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

Turn On/Turn Off Mechanism

7.02 This feature is turned on automatically by software deployment.

➡️ **NOTE:**
Service Tracer Records will not be produced until the 1B Processor is in the 4E20 Release 2 Generic.

8. Input/Output Manual Pages (Not Affected)

Service Count Tracer Records for Unanswered/Mutilated Calls Feature (4317)

8

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Service Count Tracer Records for Unanswered/Mutilated Calls Feature (4317)

8

1. Feature Description

1.01   With the 4E18 Release 1 Generic, Automatic Message Accounting (AMA) and International Call Detail Recording (ICDR) record building was moved from the AT&T 3B20D Computer Attached Processor System (APS) to the Call Detail Recording Platform (CDRP), an AT&T *StarServer*® Symmetrical Multiprocessor FT computer. The CDRP, which is collocated with the *4ESS*™ switch, communicates with the switch by means of the Small Computer Systems Interface Node (SIN) on the Common Network Interface (CNI) Ring.

1.02   At *4ESS* switch offices that do not have a CDRP, the AMA and ICDR records continue to be produced by the APS.

1.03   The *4ESS* switch inserts tracer records as markers in the stream of AMA records on an hourly basis to provide aggregate counts of the number of AMA records transmitted between successive markers. These counts are used to audit a network element's Call Detail Recording (CDR) process.

1.04   Prior to the current feature, the following three Service Count tracer records were generated by the *4ESS* switch:

■   "Lost/Discarded" Service Count tracer

■   "Full Charge" Service Count tracer

■   "Partial Charge" Service Count tracer.

1.05 The current feature adds two new Service Count tracer records for the *4ESS* switch. These new records were not developed for the CDRP, which already provided that information. The following are the new records:

- ■ "Unanswered" Service Count tracer: This record contains a count of unanswered calls for which recording was triggered but an AMA record was not made. For specific classes of calls, the 3B APS does not make an AMA record if it determines that the call was not answered.

- ■ "Mutilated" Service Count tracer: This record contains a count of the mutilated AMA records created by the *4ESS* switch. A mutilated record is one that the 3B APS produced in which the Hexadecimal Identifier in AMA Table 00 is set to "AB," signifying that some call data is missing or corrupted in the AMA record.

1.06 The five Service Count tracers are received by the Call Detail Recording Monitor (CDRM), a Network Recording Management (NRM) Work Center Operational Support System. The new tracer records enable the NRM Work Centers to monitor the CDR process of the *4ESS* switch more effectively than they could with the original three records.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording

4.01 The Service Count tracers are shown in Table 8-A. Please note that only the last two tracers are added by the current feature.

Table 8-A. Type of Tracer (AMA Table 40)

Value	Definition
058	Lost/Discarded *4ESS*™ Switch Service Count Tracer
059	Full Charge *4ESS* Switch Service Count Tracer
060	Partial Charge *4ESS* Switch Service Count Tracer
062	Mutilated *4ESS* Switch Service Count Tracer
063	Unanswered *4ESS* Switch Service Count Tracer

Use for the 'Unanswered' Service Count Tracer

4.02   Prior to this feature, CDR resource usage was calculated based on the number of AMA records formatted. However, that number did not accurately measure the use of *4ESS* switch resources because it omitted unanswered calls, for which recording was triggered but no AMA record was created.

4.03   The Unanswered Service Count tracer provides that missing information, which will be useful for planning and engineering purposes, since resources in the *4ESS* switch are used when recording is triggered. This new count of unanswered calls should be taken into account by the Network Services Division (NSD) in its CDR capacity planning tasks.

Use for the 'Mutilated' Service Count Tracer

4.04   Prior to this feature, the NRM Work Centers could determine the number of mutilated AMA records produced by the *4ESS* switch, but could not identify the service type of the mutilated records. When the total number of mutilated records reached a predefined threshold, CDRM would generate an alarm. At that point, it was necessary to look at every AMA record produced by the switch to identify the type of AMA structures being mutilated. That procedure could take as long as an hour.

4.05   This new tracer record gives the additional capability of identifying which of 43 specified service categories the failure is occurring in. With that information, an NRM Work Center can investigate the CDR failure and identify the problem in much less time.

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

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

Turn On/Turn Off Mechanism

7.02 This feature is turned on automatically by software deployment.

⇒ NOTE:
Service Tracer Records will not be produced until the 1B Processor is in the 4E20 Release 2 Generic.

8. Input/Output Manual Pages (Not Affected)

Easy Reach® Service 1+500 Dialing Plan Feature (4324)

9

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Easy Reach® Service 1+500 Dialing Plan Feature (4324)

9

1. Feature Description

1.01 The *Easy Reach*® service was first offered to Business Communications Service (BCS) customers in late 1992, based on a 0+700 dialing plan. With that service, all *Easy Reach* service calls are routed by the Local Exchange Carrier (LEC) End Office (EO) to the *5ESS*® switch Operator Services Position System (OSPS) which, in conjunction with the Quantum Data and Routing System (QDRS), provides *Easy Reach* service call processing based on the dialed number.

1.02 Since Automatic Number Identification (ANI)-based services are provided by 1+ access, these caller-subscribed capabilities are ignored by the 0+700 architecture.

1.03 In late 1994, an interim feature, Interim 1+500 Via the *4ESS*™ switch (4575), was created to allow 1+ access to *Easy Reach* service call processing. The interim feature enabled the *4ESS* switch to route 1+500 calls by way of a specific Via *4ESS* switch to four "serving" *4ESS* switches that were collocated with *5ESS* switches with OSPS. The calls were routed to one of the four *5ESS* switches with OSPS using Feature Group D (FG D) MF signaling on a dedicated trunk subgroup (TSG).

1.04 The interim feature does not allow interaction with ANI-based features, such as Software Defined Network (SDN), BCS, and Consumer Communications Service (CCS) Positive Call Processing (PCP). The architecture used in the interim feature also resulted in greater post dialing delay than desired, but it offered advantages in terms of time to market for 1+500 services.

1.05 The current feature provides 1+500 access to *Easy Reach* service via the *4ESS* switch and addresses the evolution of the *Easy Reach* service architecture to reduce unit cost and post dialing delay for 1+500 dialed *Easy Reach* service calls. The feature also provides a platform on which to build feature interworking with ANI-based services. This capability gives callers service uniformity when using 1+ calls.
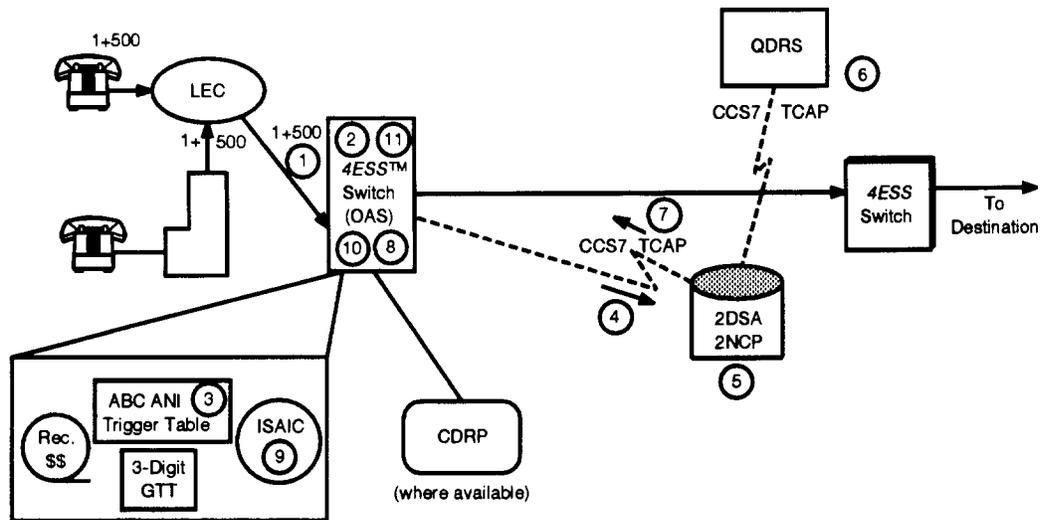
2. Call Flow

Call Flow Diagram

2.01 The call flow for this feature is illustrated in Figure 9-1. If you wish to compare the architecture of this feature with that of the Interim 1+500 feature, refer to Chapter 18 in this document.

Figure 9-1. Network Architecture and Call Flow

Call Flow Narrative

2.02 The call flow for Feature 4324 is described in this section. This call flow does not apply to 1+500 dialed calls originated via direct connect trunks, SDN access (10732 switched or direct connect), or adjuncts. Those calls will be blocked.

1. The caller dials 1+500-NXX-XXXX. The call arrives at the Originating *4ESS* switch (OAS) via the LEC switch by way of NXX-based routing; that is, the NXX of the dialed number identifies the carrier and overrides the Preferred Interexchange Carrier (PIC) of the caller.

2. The *4ESS* switch translates the dialed number. If the 500-NXX of the dialed number is a 500 *Easy Reach* service number, call processing continues. If not, vacant code treatment applies.

3. The *4ESS* switch does a lookup in the Adjunct Based Capability (ABC) ANI Trigger Table and takes the following actions:

    a. If there is an ANI match with the Feature Processing Data Type set to Feature Indicator (FI), the following actions occur depending on the FI:

        ■ FI=Network Call Denial (NCD)—Call is terminated.

        ■ FI=Business Long Distance Service (BLDS) PCP—Go to Step 4.

        ■ FI=SDN—Go to Step 4.

    b. If there is an ANI match with the Feature Processing Data Type set to Adjunct Logical Address (ALA), go to Step 4.

    c. If there is no ANI match, go to Step 4.

4. The *Easy Reach* service Feature Interaction Status Indicators (FISI) are PCP, SDN, and ALA/Customer Long Distance (CLD). If that indicator is set to no (ERFISI=NO) or if there is no ANI match, the *4ESS* switch sends a Transaction Capabilities Application Part (TCAP) query to the PCP No. 2 Network Control Point (2NCP). The TCAP message contains the ANI, the 500 dialed number, and the switch node capability. For this feature, the indicator should always be set to no (ERFISI=NO).

5. The 2 Direct Services ANI (2DSA) 2NCP determines if the call is an *Easy Reach* service call based on the 500 number and takes the following actions:

    a. If the call is not an *Easy Reach* service call, normal PCP or SDN call processing continues.

    b. If the call is an *Easy Reach* service call, the 2DSA queries the QDRS via Common Channel Signaling System 7 (CCS7) TCAP, using the first QDRS point code sent by the *4ESS* switch as the first choice. Included in the TCAP query are the dialed number and the ANI.

6. The QDRS processes the query and proceeds as follows:

   a. If QDRS cannot find a record for the 500 number dialed, final handling treatment is applied.

   b. If QDRS finds a record for the 500 number and Caller Discretion is enabled, interaction with Caller Discretion is triggered. If Caller Discretion is not enabled, the digits will be collected using current technology. Go to Step 6c.

   c. The QDRS returns an end message to the 2DSA 2NCP with the routing number and other subscriber feature information as follows:

      ■ If the Busy/Ring No Answer (B/RNA) (see Step 12) indicator was not present in the query from the 2DSA 2NCP (in an initial query), the QDRS requests all of the following:

         — The "Branding Announcement" (not played with "Caller Discretion")

         — The "International Destination Announcement" if the routing number corresponds to an international destination

         — Monitoring for B/RNA condition on the call if the subscriber has call sequencing (or messaging).

      ■ If the B/RNA indicator was present in the query from the 2DSA 2NCP (that is, the subsequent query), the QDRS requests all of the following:

         — The "Call Progress Announcement"

         — The "International Destination Announcement" if the routing number corresponds to an international destination

         — Monitoring for B/RNA condition on the call if the subscriber has call sequencing (or messaging).

7. The 2DSA 2NCP passes the end message to the *4ESS* switch.

8. Depending on the nature of the routing number provided by the 2DSA 2NCP, the switch sets the Signaling Service Type (SST) value as follows for routing purposes:

   a. The SST value is set to Transmitted Noise Reduction (TNR) if the following are true:

      ■ The routing number is non-World Zone 1 (WZ1) or International WZ1.

      ■ There is an ANI record match with an ALA whose associated application type is one of the three TNR ALAs (TNR Only, TNR and 1+ Directory Link Only, or TNR and CLD Adjunct features).

■ The ALA ERFISI is set to "NO."

b. The SST value is set to Long Distance Service (LDS) if the following are true:

■ The routing number is non-WZ1 or International WZ1.

■ There is no ANI record with one of the three ALA TNR application types mentioned above.

c. The SST value is also set to LDS if the following is true:

■ The routing number is a North American Numbering Plan (NANP), non-Special Area Code number.

9. The *4ESS* switch accesses the Improved Service Announcement and Information Collection (ISAIC), and the ISAIC plays the announcements as requested by the 2DSA 2NCP. If more than one announcement has been requested, they are played in the order they were requested in the message.

10. If the caller decides to proceed with the call, the *4ESS* switch routes the call, updates the Far End Class (FENCLASS) Automatic Message Accounting (AMA) record, and appends the *Easy Reach* service module based on billing recording information sent by the 2DSA 2NCP. If the caller hangs up, the call is terminated.

If the call is allowed to continue and the B/RNA request is present in the TCAP reply from QDRS/2DSA 2NCP, the switch monitors the call for B/RNA (starts the timer) and plays an audible ringing tone to the caller after the switch routes the call. The audible ringing is stopped when the call is answered, when another announcement is played, or when the call is terminated.

11. If a B/RNA condition occurs and the switch is monitoring for B/RNA, and one of the following occurs:

a. The OAS detects busy [CCS7 Address Complete Message (ACM) with cause value "user busy"].

b. The OAS detects no circuits available [CCS7 ACM or Release (REL) message with a cause value of "no circuits available"].

c. None of the above conditions applies, but the timer expires.

then the *4ESS* switch clears the call forward and re-queries the 2DSA 2NCP with a CCS7 TCAP Begin message containing an indication that B/RNA condition had occurred and the call flow continues at Step 5b.

If the current destination number is an *Easy Reach* service terminating treatment routing number (for example, messaging platform number), the request for monitoring the B/RNA condition is present in the reply message from QDRS, and no monitoring will be set up for such a call. The QDRS returns an 800 number for the messaging platform. In this case, the *4ESS* switch processes the call per 800 call processing and generates an 800 AMA record. The *4ESS* switch also makes a FENCLASS AMA record with the 800 number as the terminating number and with the *Easy Reach* service module for the messaging frame.

3. Provisioning

3.01 The provisioning necessary to activate this feature is described in this section.

⚠ CAUTION:
In order for the Easy Reach *service 500 POTS records to be produced, the Service Category on the input 500 codegroup (RC Forms 300-303) must indicate "Record" or "Both" on the Incoming Trunk (ICT) FENBLOCK of all ICTs that could receive these calls.*

Office Data Administration (ODA) Structures Affected

A. New Data Structures

3.02 Two new data structures have been added to support this feature:

OD4ERQDRS   A new 1-level structure is defined in Protected, Disk-backed, API accessible, and ODA populated memory (PBAO) to contain the Signaling Point Code (SPC) and Subsystem Number (SSN) for each of the up to four QDRS addresses.

OD4ERFISI   A new 1-word structure is defined in PBAO to contain the *Easy Reach* service FISI information.

B. Modified Core Structure

3.03 One new item, OD4OPT1P500, is defined that overlays the existing OD4OPTENH item to perform proprietary checks for this feature.

Recent Change (RC) Forms Affected

A. RC Forms 300-304

3.04 There are no changes on the RC 300 series forms, but there are text and population rule changes. The following entries must be made for this feature:

- DOM=POTS
- CALLTYPE=DSD
- CALLDATA=DSD3
- DNST=DNST1
- ABC=500

B. RC Form 642

3.05 Form 642 is used to enter a Service Identity Index (SII) for *Easy Reach* service. The required entries are the following:

- TORIG=LEC
- TDEST=LEC, ISC, or IWZ1
- SST=LDS or TNR
- DNST=DNST1
- SII=a number to be assigned by switch administration. Valid entries are 1 to 255.

C. Form 6db

3.06 This is not actually a new screen, but commands to add, change, and delete the QDRS point code records and the FISI.

3.07 **RC:MISC;FHT,FTA:EASYREACH,a,b,c,d[,e]!** is the input message for QDRS data. The variables are as follows:

- a=the order number, a unique number in the range 000001 to 999999.
- b=the action required, with A to add, C to change, and D to delete data.
- c=a field to indicate that EASYREACH QDRS data is being input, with D as the specified entry.
- d=the 9-digit SPC.
- e=the 6-digit SSN. For add and change requests, 6 digits must always be specified. The range of valid entries is 000000 to 000255. For delete requests, this field is optional.

3.08 **RC:MISC;FHT,FTA:x,a,b,c,d!** is the input message for FISI data. The variables are as follows:

■ x=the indicator that is being changed.

■ a=the order number, a unique number in the range 00001 to 999999.

■ b=the action required, the only allowed entry being C for change.

■ c=a field to indicate that EASYREACH FISI data is being input, with I as the specified entry.

■ d=the new value for the indicators in field x.

Verify Forms Affected

A. Form 16db

3.09 This is not actually a new screen, but a command to output the point code records and the FISI. The input message is **VER:MISC:FHT EASYREACH**.

B. Form 6db

3.10 The output message is VER:MISC:FHT EASYREACH.

AT&T 3B20D Computer Provisioning

3.11 The 3B20D computer must also be provisioned for this feature to set the correct point code and subsystem number for each ANI. The following command to provision for the appropriate 2DSA point code should be entered from the 3B20D computer Recent Change terminal:

RC:MISC;FHT,FTA:GTT10D242,IRAS06659,A,L,NUM(1,0,WWWXXXXXXXXX,YYYZZZZZZZZZ,NPA)

The variables are as follows:

■ WWW=Primary Subsystem Number

■ XXXXXXXXX=Primary Point Code

■ YYY=Secondary Subsystem Number

■ ZZZZZZZZZ=Secondary Point Code

■ NPA=Numbering Plan Area of the ANI.

4. Recording

4.01 To properly rate and bill for *Easy Reach* service calls, the 500 number called, as well as some additional *Easy Reach* service specific information, must be recorded in the AMA record in addition to the information normally collected for billing a 1+ call. Recording capability impacts are reflected in the *4ESS* switch, 2DSA NCP, and the Call Detail Recording Platform (CDRP) requirements. Only the *4ESS* switch requirements are described in this document.

4.02 *Easy Reach* service AMA records are created when the OAS receives the Digits parameter (the dialed 500 number) from the 2DSA 2NCP in the TCAP END message with Charging-Bill Call operation. The *Easy Reach* service AMA record is obtained by appending Extended Bellcore AMA Format (EBAF) module 924 to a FENCLASS AMA record. In the terminating number field, the AMA record contains the destination number received from the 2DSA 2NCP. The overseas indicator is also populated based on the nature of the routing number.

4.03 If the routing number in the TCAP message from 2DSA 2NCP is an 800 number, 800 service call processing applies to the call for routing purposes, and an 800 AMA record is generated. In addition, a FENCLASS AMA record is generated with the 800 number in the destination NPA and number fields. The *Easy Reach* service module is appended to this AMA record.

4.04 Only answered *Easy Reach* service calls generate an *Easy Reach* service AMA record. For call sequencing, where several attempts are made to different destination numbers, only one *Easy Reach* service AMA record is made when the call is answered. Previous attempts in the sequence are ignored. If an 800 AMA record is initiated during the sequence, the 800 AMA record is made regardless of the disposition of the call, as per previously existing requirements.

4.05 If a B/RNA condition is detected and call processing initiates another call attempt by sending another query to the 2DSA 2NCP, the switch sends a DISC event CDRP with the Hold RR and RNA indicators set (word 5, bits 20 and 21). These indicators trigger previously existing logic in the CDRP to save all data for the first leg of the call except the egress data. That data will be updated for the second leg of the call by subsequent events from the switch.

4.06 The *4ESS* switch sends the CDRP a new event EZR, which contains the routing number received from the 2DSA 2NCP for an *Easy Reach* service call. Bit 6 in word 8 of the OC event is used to tell the CDRP that an EZR event was sent on the call.

4.07 The *4ESS* switch sends the CDRP, via existing events, the necessary information to create under certain conditions an AMA record with the *Easy Reach* service module as well as an 800 AMA record for the same call.

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

6.01   There are three new Final Handling Codes associated with this feature. These codes are listed in Table 9-A.

Table 9-A. Final Handling Codes

Code Number	Description
2066	**Last Normal Condition**–Initialize Direct Services Dialing (DSD) Original Dialed Number (ODN) and ANI.
	Irregular Condition–The QDRS Point Code and Subsystem Number are not available.
	Handling–The *4ESS*™ switch connects the caller with a vacant code announcement and kills the call.
2067	**Last Normal Condition**–A TCAP END message was received from the database.
	Irregular Condition–The TCAP END message contained Invalid TCAP parameters.
	Handling–The *4ESS* switch routes the call but reports a call irregularity.
2068	**Last Normal Condition**–The call type was determined.
	Irregular Condition–The call comes in on an invalid incoming trunk.
	Handling–The *4ESS* switch connects the caller with a vacant code announcement and kills the call.

7. Transition Considerations

Ubiquity

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

Turn On/Turn Off Mechanism

7.02   Refer to "Provisioning" in this chapter for details about how to turn on this feature.

8. Input/Output Manual Pages

8.01   The following two new input/output messages are associated with this feature:

- IM-4B000-01   **TEST:TCAPDSD**
- OM-4B000-01   **TEST:TCAPDSD**

```
ID . . . . . . . . . . . . TEST:TCAPDSD
WORK CENTER . . MAC, MOC, NMOC, TOC
GENERIC . . . . . . 4E20 Rel. 2 and later
CLASS . . . . . . . . ALL
APPLICATION . . 4E
TYPE . . . . . . . . . . Input
```

1. PURPOSE

Requests a test query to be sent to the network control point (NCP) from the 4ESS™ Switch serving as an action control point (ACP). This test query tests the integrity of the common channel signaling system 7 (CCS7) network between the two end points utilizing the Consultative Committee on International Telephone & Telegraph (CCITT) based transaction capability application part (TCAP) protocol. It also serves as a tool to test the data for a particular direct services dialing (DSD) customer. The types of queries sent to the NCP can be either for automatic number identification (ANI)-based services (switched digital network [SDN]) or dialed number-based services (A800 types).

Format [1] is used to request an ANI-based test query (SDN services).
Format [2] is used to request a dialed number-based test query (A800 type services).
Format [3] is used to request a universal global title translation (UGTT) test query.
Format [4] is used to request a network access interruption (NAI) test query.

2. FORMAT

[1]   **TEST:TCAPDSD;QRYTYPE a:DIG b,ANI c[,APN][,AUTHCODE d]
        [,RATE e][,SGD f][,LIST]!**

[2]   **TEST:TCAPDSD;QRYTYPE a:DIG b[,RATE e][,LIST][,ANI c|,ANI c,APN]!**

[3]   **TEST:TCAPDSD;QRYTYPE a:{ANI c|ANI c,APN}[,SD]!**

[4]   **TEST:TCAPDSD;QRYTYPE 5:DIG b,ANI c[,RATE e]
        [,IIDIGITS g|,OLI h|,CID i|,OLI h,CID i]!**

3. EXPLANATION OF MESSAGE

a   The type of query to be sent:

                1 — ANI-based query
                2 — Non-call associated temporary signaling connection (NCAT) ANI-based query
                3 — Dialed number-based query
                4 — NCAT dialed number-based query
                5 — NAI query
                6 — UGTT query
                7 — NCAT UGTT query
                9 — EasyReach query.

b	Customer specific digits that are required for the particular type of DSD call. Digits for the ANI-based queries can be either 7 digits or 10 digits. For the dialed number-based query, 10 digits must be specified. For international SDN queries a "**011**" must prefix the dial number, this is only valid for format [1] and format [4].
c	A required variable for the ANI-based queries. Customer's 10-digit automatic number identification.
d	A customer's authorization code number. It is an optional variable. There can be a maximum of 12 digits. For EasyReach query type this is the echo data that should be sent in the requery to the quantum routing data system (QRDS). This can be a maximum of 10 bytes (20 digits).

e	An optional variable used to specify a data rate for a DSD call. The possible values are as follows:

        0 = Non data (voice call)
        1 = 1.536Mbps clear
        2 = 1.536Mbps restricted
        3 =   384Kbps clear
        4 =   384Kbps restricted
        5 =   64Kbps clear
        6 =   56Kbps
        7 =   64Kbps restricted

f	Station group designator number. An optional variable for ANI-based queries. The value specified as input depends on the individual customer.
LIST	If this keyword is present in the input message, then the dump of the message received from the NCP database is printed.
APN	If this keyword is used to define the ANI variable, then the ANI must be an action point numbering plan (APN) ANI.
	If this keyword is not used to define the variable, then the ANI must be a North American numbering plan (NANP) ANI.
SD	Only valid with a UGTT query. If present then the secondary UGTT database will be queried. Default is to query the primary database.
g	Information digits, also called the originating station type. Identifies characteristics of the calling station (0-99).
h	Originating line identity, also called the originating station type (0-99).
i	Carrier selection information:

        1 — Presubscribed, no input.
        2 — Presubscribed, input.
        3 — Presubscribed, input or not.
        4 — Not presubscribed, input.

4. SYSTEM RESPONSE

?D   Data field error. Invalid or out-of-range data was received in the input message.

?E   Syntax error. An invalid keyword combination was discovered.

PF   Printout follows. The test query has been initiated and the results will be printed.

RL   Retry later. No teletypewriter (TTY) output buffer or trunk maintenance register available.

5. REFERENCES

PIDENTs
DSDCMESS
IOCPIMC4
TCAPTEST
TMAD0005

Output Message
TEST:TCAPDSD

ID . . . . TEST:TCAPDSD
WORK CENTER. . MAC, MOC, NMOC, TOC
GENERIC . . . . . . 4E20 Rel. 2 and later
APPLICATION . . 4E
TYPE . . . . Output

1. FORMAT

[1]   TEST:TCAPDSD:QRYTYPE a:DIG b,ANI c [,APN][,AUTHCODE d]...
       [,RATE e][,SGD f][,LIST]
       g

[2]   TEST:TCAPDSD:QRYTYPE a:DIG b [,ANI c|,ANI c, APN][,RATE e] ...
       [,LIST]
       g

[3]   TEST:TCAPDSD;QRYTYPE a:{ANI c |ANI c, APN} [,SD]
       g

[4]   TEST:TCAPDSD;QRYTYPE 5:DIG b,ANI c [,RATE e] ...
       [,IIDIGITS h|,OLI i|,CID j|,OLI i,CID j]
       k

2. REASON FOR OUTPUT

This output message is in response to the TEST:TCAPDSD input message. Format 1-3 requests either a dialed number-based query or an automatic number identification (ANI)-based query. Format [4] requests a network access interruption (NAI) test query.

Variable field g explains the results of the test query (whether successful or not), and gives information to support the results.

3. VARIABLE FIELD DEFINITIONS

a   The type of query sent:

                              1 — ANI-based query
                              2 — Non-call associated temporary signaling connection
                                   (NCAT) ANI-based query
                              3 — Dialed number-based query
                              4 — NCAT dialed number-based query
                              5 — NAI query
                              6 — Universal global title translation (UGTT) query
                              7 — NCAT UGTT query
                              9 — EasyReach query

b   Customer specific digits that are required for the particular type of direct services dialing (DSD) call. These digits for the ANI-based queries can be either 7 digits or 10 digits. For the dialed number-based query, 10 digits would be specified.

c   A required parameter for the ANI-based queries. This should be the customer's 10-digit automatic number identification.

APN   If this keyword was used in the input message to define the ANI parameter, then the ANI must be an action point numbering plan (APN) ANI.

           If this keyword was not used in the input message to define the ANI parameter, then the ANI must be a North American numbering plan (NANP) ANI.

d   A customer's authorization code number. An optional parameter with a maximum of 12 digits. For EasyReach query type this is the echo data that should be sent in the requery to the quantum routing data system (QRDS). This can be a maximum of 10 bytes (20 digits).

e   An optional parameter used to specify a data rate for a DSD call. The possible values are:

           0 = Non data (voice call)
           1 = 1.536Mbps clear
           2 = 1.536Mbps restricted
           3 = 384Kbps clear
           4 = 384Kbps restricted
           5 =   64Kbps clear
           6 =   56Kbps
           7 =   64Kbps restricted

f   An optional parameter for ANI-based queries. It is the station group designator number. The value specified as input depends on the individual customer.

LIST   If this keyword was used in the input message, the dump of the message received from the network control point (NCP) database is printed.

g   The output from this test query will indicate whether the query was successful or not. (See the example.) If the query is successful, the output will show what operations were requested by the customer record at the NCP database along with the routing digits and domain value. If the query is not successful, the output will indicate the final handling code and reason for failure.

EXAMPLE: SUCCESS ...

The following text phrases may appear when the query succeeds:

ANI   — ANI digits from NCP.

CUSTOMIZED ANNOUNCEMENT RECEIVED — One   or   more customized announcements have been received.

DOMAIN   — The routing domain associated with the digits.

FAI DIGIT — The digit returned form the NCP to determine the foreign administration identification for the carrier.

RATE — Data rate for this call.

RECEIVED ACG

RECEIVED CALL TAG

RECEIVED CHECK APPLICATION STATUS

RECEIVED REFRESH

RECEIVED REQUEST TO CANCEL ANNOUNCEMENT

RECEIVED REQUEST TO PERFORM AN ASSIST

RECEIVED REQUEST TO PERFORM NCP TRANSFER

RECEIVED REQUEST TO QUEUE CALL

RECEIVED SEND TERMINATION

ROUTING DIGITS — The digits returned from the NCP to route this call.

SGD — Semi global data (SGD) digit for this call.

STANDARD ANNOUNCEMENT RECEIVED

SUPPLEMENTAL ROUTING INFO — The supplemental routing information specifies the service.

VALID CUSTOMER ID: 888-000-1234 — UGTT query.
   PRIMARY SPC: 254 31 6 3
   PRIMARY SSN: 252
   SECONDARY SPC: 254 31 6 3
   SECONDARY SSN: 252

The following text phrases may appear when the query fails.

EXCEPTION CODE — A number from 0-127 that defines the error.

FAILURE

FINAL HANDLING CODE — FHCODE.

PROTOCOL ERROR

RECEIVED P-ABORT

RECEIVED U-ABORT

TIMEOUT

SD   Only valid with a UGTT query. If present then the secondary UGTT database will be queried. Default is to query the primary database.

h	Information digits, also called the originating station type. Identifies characteristics of the calling station (0-99).
i	Originating line identity, also called the originating station type (0-99).
j	Carrier selection information:

> 1 — Presubscribed, no input.
> 2 — Presubscribed, input.
> 3 — Presubscribed, input or not.
> 4 — Not presubscribed, input.

k	The output from the test query when successful:

```
ALLOW CALL

COMPLETED-SUCCESS

ELAPSED TIME #.# SECONDS
```

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

PIDENTs
  DSDCMESS
  TCAPTEST

Input Message
  TEST:TCAPDSD

Recent Change Administration System (RCAS)—Phase 2 Feature (4366)

10

Contents

Recent Change Administration System (RCAS)—Phase 2 Feature (4366)

10

1. Feature Description

1.01 The Recent Change Administration System (RCAS) is a generic capability used to update administrative data in the *4ESS*™ switch. The RCAS platform enhances the office data provisioning throughput into the *4ESS* switch by moving Recent Change (RC) functionality into a remotely located processor called RCAS. The RCAS capability allows a provisioning Operating System such as the Integrated Routing Assignment System (IRAS) to send RC data to the RCAS platform for update instead of to the *4ESS* switch. This is done to decrease the RC session time from about 6.0 seconds per update (via the *4ESS* switch) to less than 1.0 second per update (via RCAS). During a typical RC session, RCAS retrieves office data from the switches in the network, updates that data with the changes from IRAS, and then returns the data back to the switches.

1.02 The RCAS platform provides faster RC throughput and a more efficient way for provisioning Operating Systems to access and modify office data. The increase in provisioning time is necessary to meet *4ESS* switch customer agreements for generic retrofits and RC updates. Prior to RCAS, a lot of time was spent provisioning and maintaining the service data structures in the *4ESS* switch using the file transfer method, and there was not enough time to update all the RC data needed for the RC session. If left unchanged, this situation could become worse with the increase in the number of RC orders requiring provisioning. Through RCAS, however, this problem is resolved since RCAS provides a much faster RC interface to the *4ESS* switch. The throughput into the switch is lessened to about 0.8 second per RC order (versus 6.0 seconds per RC order). RCAS throughput is affected by the call load and the size of the data base [that is, the 1B Processor Positive Call Processing (PCP) table].

1.03 Since the initial two releases of RCAS are used to support AT&T proprietary features (that is, 1B Processor PCP table), the RCAS application is not available for use in Regional Bell Operating Companies. RCAS is deployed in two phases, Phase 1 and Phase 2. The National Electronic Switching Assistance Center (NESAC) handles the system administration (including hardware and software support) for both phases.

Phase 1—Feature 4269

1.04 Phase 1 (Feature 4269) was deployed in the fourth quarter of 1994. Phase 1 provides support for generic retrofit-only RC activity via the Attached Processor System (APS) Off-Line Processor (OLP). An RC activity during Phase 1 included updating the Automatic Number Identification (ANI) data relative to the generic retrofit. ANI RC data was loaded into RCAS via a Packet Internal Network (PINET) data link from IRAS, processed with the new generic database, and sent to the OLP. The Dedicated Wide Area Network (DWAN) provides an additional interface by which data is transferred to the OLP. After the data had been verified and tested, it was then downloaded into the retrofit switch. A typical day-to-day RC activity for the ANI data structures was processed from IRAS directly into the *4ESS* switches. This allowed IRAS to provide more time toward daily RC activities since RCAS was capable of handling the retrofit load.

Phase 2—Feature 4366

1.05 RCAS Phase 2 (Feature 4366) is scheduled for deployment in the second quarter of 1995. Phase 2 provides support for overall RC activities. The initial release of RCAS Phase 2 is only used for 1B Processor-based PCP (ANI) table RC. Phase 2 gives RCAS full ANI RC update capabilities both for generic retrofits and for day-to-day data structure updates. In Phase 2, RCAS is connected to AT&T 3B20D computers in individual *4ESS* switch offices via DWAN 56-Kbps BX.25 data links. RC data is returned to the switch via the DWAN data links. The DWAN data links allow RCAS to communicate directly with the *4ESS* switches in the field instead of with the OLP.

1.06 RCAS is not limited to only certain switch data structure updates, but can be used for all data structure administration. An update session between RCAS and any given *4ESS* switch office can be scheduled without inhibiting other IRAS-related update activity at the same office. RCAS and IRAS can both access the switch and update the data simultaneously without blocking each other. Additionally, the same data structures may be accessed and updated. RCAS can detect such events and stands ready to initiate corrective actions to ensure that data is protected within the switch.

1.07 The following provisioning flow occurs when data structure administration applications are developed and deployed on the platform:

1. IRAS receives data structure updates (RC orders) from the Outbound Service Management System or Consumer Provisioning System (for example), performs checks, and transmits the RC data to RCAS using file transfer. The RC data includes the Order Number, ANI information, CLLI* code, and an Operation Code (add, delete, change). The data is stored in RCAS until IRAS sends an activation command to RCAS.

2. When RCAS receives the activation command from IRAS, RCAS starts the RC session. If the number of DWAN connections available for updates is not enough to begin RC sessions with all the switches requiring updates, RCAS will hold the files and continue establishing connections until all switches have been updated.

3. RCAS sends a read request message to the switches to retrieve the data structures that need to be changed. This data is stored in RCAS.

4. RCAS updates the data in its memory (that is add, change, or delete) and stores it. It then sends a write request message to the switch to indicate the memory location, new data, and any detected errors.

5. When the write request message is received in the 3B20D computer APS, a disk write occurs causing both the 3B APS disk and the 1B Processor core memory to be updated.

6. When the first change transaction is completed successfully, RCAS starts the next change transaction. This continues until all data received from IRAS has been updated in the appropriate switches.

2. Call Flow (Not Affected)

3. Provisioning

3.01 The existing File Transfer and Activation (FTA) mechanism is used to transmit the RC data to RCAS using file transfer and activation commands. However, the following existing FTA commands need clarification:

- FILE:EXEC <filename> {:ENTRY <x>}!—With respect to RCAS, the "x" value can be any value to continue the execution of the command file <filename>. With the original FTA, the provisioning Operations Support System (OSS) must specify a valid "x" value to continue the execution of the command file <filename>.

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■ FILE:RSTAT!—With respect to RCAS, this command provides no useful information. This command is intended for use by a provisioning OSS to see the amount of storage left on the 3B computer (original FTA mechanism).

The "all fail" option in the transaction is not used when it is included in the command file.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Hardware/Software Requirements

A. Hardware

7.01 The RCAS is physically deployed at a central location in Warrenville, Illinois at NESAC/Integrated Test Network (ITN). It operates within a host system consisting of engineered-size, commercial-grade computer hardware. The hardware is the same hardware used in RCAS Phase 1.

7.02 An RCAS complex may have several RCAS workstations, each connected to a DWAN circuit. Having at least two workstations doubles the overall RCAS performance. An individual RCAS system interfaces to the DWAN using Closed User Group protocol for security purposes. The interface supports a minimum of 24 equivalent 56-Kbps channels. As stated previously, the number of RCAS workstations and the number of DWAN circuits are both engineered quantities.

7.03 The RCAS feature requires a standard TN-82B circuit board (one per office) on the 3B20D computer Input/Output (I/O) port. Also required is a DWAN 56-Kbps link to the 3B20D computer in the *4ESS* switch office. The DWAN link is shared between this feature (4366) and the Office Data Assembler Datalinking (ODAD) feature (4053). Phase 1 of the ODAD feature grew the 56-Kbps data link to the Synchronous Data Link No. 24 (SDL-24) I/O port of the APS at all AT&T-owned *4ESS* switch offices.

The procedure for growing the 56-Kbps link is covered in the existing Task Oriented Practice (TOP), AT&T 234-153-025, *4ESS™ Switch, Attached Processor System Growth/Degrowth.*

B. Software

7.04   The RCAS interface is built upon the existing Next Generation-Office Data Administration (NG-ODA) system architecture to enhance and reduce the cost of *4ESS* switch Office Data Assembler retrofits. The NG-ODA is a retrofit tool used to populate office data for retrofit between generic releases. RCAS uses the same base platform software, the Office Database Management System (ODMS) which defines all the data structures in the *4ESS* switch, with new application software for Positive Call Processing RC activities.

7.05   The software needed for RCAS consists of specific application software to drive RC activities, DWAN communication software, Cache protocol software, and I/O software to the provisioning system(s). Additional software is required in the *4ESS* switch to interface with RCAS. This includes both 1B Processor and 3B APS I/O interface software.

7.06   The 1B Processor has been upgraded with new software. The new software allows RCAS to interact with other units and perform RC updates that are totally independent of interaction from other systems occurring simultaneously (for example, when IRAS emergency orders are being processed).

7.07   The 3B20D computer is the arbitrator between RCAS and the 1B Processor. It has also been updated with a new code to interact with RCAS and perform RC updates that are totally independent of interaction from other systems occurring simultaneously.

Other Network Dependencies

7.08   This feature relies on an OSS that connects to RCAS over either DWAN facilities (Phase 2) or PINET (Phase 1). Presently, IRAS is the only OSS that uses the PINET interface. RCAS, which uses the DWAN interface, has the capability to terminate either interface. The two interfaces allow RCAS to use the file transfer method to transmit RC data.

Ubiquity

7.09   Deployment of the 4E20 Release 2 Generic is required throughout the AT&T *4ESS* switch network in order for the RCAS Phase 2 feature to be operational.

Turn On/Turn Off Mechanism

7.10 This feature is automatically turned on by software deployment per *4ESS* switch office.

8. Input/Output Manual Pages

8.01 A new 3B20D computer input message, **OP:RCAS**, has been created for use with this feature. This input message requests the RCAS kernel process to report the status of RCAS tasks, RCAS measurement counts, and RCAS files.

8.02 Four new 3B20D computer output messages are associated with the RCAS feature. These messages are given in Table 10-A.

Table 10-A. 3B20D Computer Output Messages

Message	New/ Modified	Description
OP:RCAS-TASKS	New	Reports the status of RCAS tasks.
OP:RCAS-MEAS	New	Reports the status of RCAS measurements. This output message gives the non-zero measurement counts which includes the name of the item and the total value of items processed.
OP:RCAS-FILES	New	Reports the status of RCAS files. The report lists the following information: ■ Path name ■ File status ■ Number of reads and writes ■ Number of bytes read and written.
REPT:RCAS	New	Prints out RCAS status and error messages. The output includes the RCAS task that generated the report and the message contents and size. Seek technical assistance if errors occur.

ID . . . . OP:RCAS
WORK CENTER . . MOC
GENERIC . . . . . . 4AP13 Rel. 2 and later
APPLICATION . . 4E
TYPE . . . . Input

1. PURPOSE

This input message requests the RCAS kernel process to report status of RCAS tasks, RCAS meas, or RCAS files.

2. FORMAT

OP:RCAS,a!

3. EXPLANATION OF MESSAGE

a   Report the status of **RCAS** tasks, **RCAS** meas, or RCAS files. Possible values:

TASKS — **RCAS** tasks.
MEAS — **RCAS** meas.
FILES — **RCAS** files.

4. SYSTEM RESPONSE

PF   Printout follows. Followed by OP:RCAS output message.

NG - BAD OST CALL   No good. Operating system trap call to **RCAS** failed.

NG - RCAS UNKNOWN REQUEST No good. **RCAS** received an unknown request.

RL - RCAS IS NOT RUNNING Retry later. The kernel process **RCAS** is not running.

RL - UNKNOWN RESPONSE FROM RCAS Retry later. Unknown response from **RCAS**.

RL - UNABLE TO OPEN TMP FILE Retry later. Unable to open temporary file for output message.

5. REFERENCES

Output Messages
    OP:RCAS-TASKS
    OP:RCAS-MEAS
    OP:RCAS-FILES

```
                              ID . . . . . . . . . . . OP:RCAS-TASKS
                              WORK CENTER . . MOC
                              GENERIC . . . . . . 4AP13 Rel. 2 and later
                              APPLICATION . . 4E
                              TYPE . . . . . . . . . Output
```

1. FORMAT

```
OP RCAS TASKS COMPLETED

TASK CONTROL BLOCK (TCB) STATUS

TCB    STATUS    PROCID    NAME    STACK    SWITCHES
 a     X'b       X'c       X'd     X'e         f
```

2. REASON FOR OUTPUT

To report the status of RCAS tasks.

3. VARIABLE FIELD DEFINITIONS

a   Task control block (tcb) number. Possible values: 0 through 15.

b   Task status. Representation of bits:

> 0x0   — tcb slot is available.
> 0x1   — tcb slot is in use.
> 0x2   — tcb is ready to run.
> 0x4   — tcb is currently running.
> 0x8   — tcb is to be torn down.
> 0x10   — tcb is timing.
> 0x20   — tcb is starting.
> 0x40   — tcb is expecting an RTR msg stimulus.
> 0x80   — tcb is expecting an INT msg stimulus.
> 0x100   — tcb is expecting an ACK msg stimulus.
> 0x200   — tcb is expecting WAKEUP event
> 0x400   — tcb is expecting SHUTDOWN event
> 0x800   — tcb is expecting user event 1.
> 0x1000 — tcb is expecting user event 2.
> 0x2000 — tcb is expecting user event 3.
> 0x4000 — tcb is waiting for an audit to be dispatched.

c   Procedure ID. Byte representation:

First byte (leftmost) — Zero value.
Second byte — Procedure number.
Third byte — tcb number.
Fourth byte (rightmost) — Incarnation bit.

Procedure ID equal to zero implies null procedure.

d	Procedure name.
e	Stack address.
f	Number of switches made by the process.

4. ACTION TO BE TAKEN

None.

5. REFERENCES

Input Message
OP:RCAS

```
ID . . . . . . . . . . . . OP:RCAS-MEAS
WORK CENTER . . MOC
GENERIC . . . . . . 4AP13 Rel. 2 and later
APPLICATION . . 4E
TYPE . . . . . . . . . Output
```

1. FORMAT

```
OP RCAS MEAS COMPLETED

RCAS MEAS REPORT

NAME    VALUE
  a       b
```

2. REASON FOR OUTPUT

To report the status of RCAS meas.

3. VARIABLE FIELD DEFINITIONS

a   Name of the measurement.

b   Value of the measurement.

4. ACTION TO BE TAKEN

None.

5. REFERENCES

Input Message
    OP:RCAS

ID . . . . OP:RCAS-FILES
WORK CENTER . . MOC
GENERIC . . . . . . 4AP13 Rel. 2 and later
APPLICATION . . 4E
TYPE . . . . Output

1. FORMAT

```
OP RCAS FILES COMPLETED

RCAS FILES STATUS

PATHNAME    STATUS    READS/BYTES    WRITES/BYTES
    a         b          c/d            e/f
```

2. REASON FOR OUTPUT

To report the status of RCAS files.

3. VARIABLE FIELD DEFINITIONS

a	Pathname of the file. Possible values: `/dev/1afile0|1`, and `/dev/odad`.
b	File status.
c	Number of reads.
d	Number of bytes read.
e	Number of writes.
f	Number of bytes written.

4. ACTION TO BE TAKEN

None.

5. REFERENCES

Input Message
    OP:RCAS

ID . . . . REPT:RCAS
WORK CENTER . . MOC
GENERIC . . . . . . 4AP13 Rel. 2 and later
APPLICATION . . 4E
TYPE . . . . Output

1. FORMAT

REPT RCAS PROC (task): msg

2. REASON FOR OUTPUT

To report RCAS status and errors.

3. VARIABLE FIELD DEFINITIONS

task   The RCAS task generating the report:

task	function
Init	RCAS application initialization handler
In_rcas	Incoming RCAS packet handler
Out_rcas	Outgoing RCAS packet handler
In_1b	Incoming 1B packet handler
Out_1b	Outgoing 1B packet handler
Rd_disk	Read disk request handler
Wt_disk	Write disk request handler
Audit_mgr	RCAS audit handler
Hb_rcas	RCAS heartbeat handler
Hb_1b	1B heartbeat handler
Hb_req	Heartbeat request handler

msg   Message contents. The RCAS status and error messages are listed.

DATA LINK (SDL24) CONNECTED

TIMEOUT WAITING FOR SETUP MSG

TIMEOUT WAITING FOR SETUP RESP MSG

RD-DISK KILLED!

WT-DISK KILLED!

RCVD ABORT MSG

UNEXPECTED MSG RCVD IN IDLE STATE

FAILED TO START HB-1B TASK

FAILED TO START HB-RCAS TASK

SESSION STARTED

UNEXPECTED MSG RCVD IN W_SETUP_RESP STATE

SESSION DISCONNECTED

UNEXPECTED MSG RCVD IN CONNECTED STATE

FAILED TO OPEN DATA LINK (SDL24)

FAILED TO SEND I_AM_HERE MSG

FAILED TO START IN-1B TASK

FAILED TO START OUT-1B TASK

FAILED TO START IN-RCAS TASK

FAILED TO START OUT-RCAS TASK

FAILED TO START HB-REQ TASK

FAILED TO START RD-DISK TASK

FAILED TO START WT-DISK TASK

FAILED TO START AUDIT TASK

FAILED TO SND EVENT

EXIT

alocmsg(size) FAILED

queuemn(rcode) FAILED

TIMEOUT

RCVD UNEXPECTED EVENT type

STATE VAR BAD (state)

UNEXPECTED REQUEST RCVD

UNEXPECTED RESPONSE RCVD

UNEXPECTED MSG RCVD

UNEXPECTED SUPERVISOR MSG RCVD

ERROR: Taskerr() CALLED FROM KERNEL STACK

f_devid(): UNABLE TO ATTACH TO ECD

f_devid(): INVALID LOGDEV FOR name

SMSG OWNED BY UNKNOWN TASK name

OLD SMSG msg=msg task=name

LMSG OWNED BY UNKNOWN TASK name

OLD LMSG msg, time

OLD LMSG msg=msg task=name

type LIST: LINKED TO BUSY SMSG

type LIST: LINKED TO BUSY LMSG

type LIST: MSG INDEX NOT FOUND

type MSG QUEUE SIZE MISMATCH

free_int_msg(): BAD MSG POINTER (0xmsg)

kfault(): NON-TASK FAULT X'type
AT X' addr REG0 X'addr REG8 X'addr

FAILED TO START name TASK

FAILED TO SEND EVENT rcode

teardown(): BAD TCB POINTER tcbp

TASK TEARDOWN: task, ERR CODE: errcode

TASK TEARDOWN: task INTER STAT

TEARDOWN TASK task STACK OVFL SP=X'addr

FAILED TO RESTART TASK (task)

RESTARTING TASK (task)

```
FLT_QMSAUD OLD MSG: TYPE=type

BAD FAULT TYPE type

AUDIT ERR CODE X'errcode

UNEXPECTED EVENT TYPE RCVD type

FAILED TO START num TASK

FAILED TO FIND TASK FOR ACK

FAILED TO ATTACH ACK MSG rcode

FAILED TO ATTACH AP_MSG MSG rcode

SETUP RCVD

SHUTDOWN

INACTIVITY TIMEOUT

HEARTBEAT TIMEOUT

HEARTBEAT SUCCESS

DATA LINK WRITE FAILED

DATA LINK READ FAILED
```

size	Size of the msg.
rcode	Return code value.
state	State value returned.
name	Name of record or task.
msg	Msg in case.
time	Timestamp returned.
type	Type of list, msg, event or, fault.
addr	Address in hex.
tcbp	Tcb pointer value.
task	Name of the running task.
errcode	Error code generated by the system.

4. ACTION TO BE TAKEN

Seek technical assistance if errors occur.

5. REFERENCES

None.

International Billed Number Screening (IBNS)—Phase 2 Feature (4430)

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International Billed Number Screening (IBNS)—Phase 2 Feature (4430)

11

1. Feature Description

1.01 This fraud control feature assures that all foreign Post Telephone and Telegraph (PTT) operator-assisted calls destined for the United States will be routed to the AT&T Switched Network (ASN) for billing validation before proceeding further.

1.02 Prior to this feature, International Billed Number Screening (IBNS), Phase 1 allowed PTT operators to verify the legitimacy of a collect call destined for the United States without involving an Operator Services Position System (OSPS) operator. This was done by requiring the PTT operator to dial a special automated inward code to reach the OSPS. An IBNS query was launched to the Line Identification Data Base (LIDB) for station type validation. If the station was identified as a public type, including a coin station, a deny message was returned and the OSPS operator would play a deny announcement to the PTT operator. If the station was a valid station that could receive collect billing, an allow message was returned and the OSPS operator would play a call allow announcement to the PTT operator. The PTT operator would then release the inward call and proceed to connect the call for the caller if collect billing was allowed.

1.03 The major problem with the IBNS Phase 1 capability outlined above is the condition for fraud that exists when the PTT operator chooses to ignore the warning message that disallows the collect call. This feature corrects that problem by requiring billing validation before the call is allowed to proceed.

Special Codes and Formats

1.04 This feature is impacted by a number of terms, special codes and formats including the following:

- Language Information—This refers to Language Digit (LD) in call routing data when International Telephone and Telegraph Consultative Committee 5 (CCITT5) signaling is used or to the Calling Party's Category (CPC) parameter of the Initial Address Message (IAM) when CCITT6 or CCITT7 signaling is used. Either way, a value of 2 indicates that the call is handled by an English-speaking operator.

- ABC-WXY-NPAZ—This sequence represents the special routing codes used in the ASN for routing calls requiring IBNS treatment. Appropriate WXY codes are assigned to the gateway switches and will not be assigned to other services. The Numbering Plan Area (NPA) is the area code of the called number, and the value for ABC is the one assigned to Alternate Access To Operator Service (AATOS) which is 129. The Z is a digit from 0 through 9.

- ABC-WXYZ—This is the special routing code without the NPA component. This terminology is used to represent the codes that must be assigned to this feature via Recent Change (RC) Form 6da on a per-gateway switch basis.

- 129-101-NPAZ—This sequence represents a forward number outpulsed from the *4ESS*™ switch to the OSPS via MF intertoll trunks for calls requiring IBNS treatment.

- ABC—This sequence represents the first 3 digits of the routing number.

- DEF—This sequence represents the second 3 digits of the routing number.

- Modified Feature Group C Signaling—This is also known as MFJ Feature Group C-Expanded Address signaling. The format of this signaling is similar to that used for AATOS, which is KP+10D+ST followed by KP+II+7D+ST.

Feature Capabilities

1.05 The capabilities provided by this feature will force PTT operators to perform billing validations in the ASN for collect calls terminating in the United States. As the call reaches a *4ESS* switch International Switching Center (ISC) (gateway), the LD in CCITT5 routing data and the CPC parameter in CCITT6 (or CCITT7 IAM) is examined. If the LD indicates that the call is handled by an operator (value of 2), the forward routing number is checked.

1.06 Calls with an international destination (including Canada) and International 809+DEF numbers will not be impacted by this feature. If the forward routing number is terminating in the United States (not including Canada and International 809+DEF numbers), the NPA of the routing number is checked. If the NPA is under 200, the call is a special service call, such as *USADirect*® telecommunications service, I-800, or Pay-800. These special calls will not be impacted by this feature.

1.07   The following rules apply to the 809+DEF numbers:

- Calls to Puerto Rico and the U.S. Virgin Islands should receive IBNS treatment.

- Calls to other 809 NPA areas should not receive IBNS treatment.

1.08   If the NPA is above 200 and is not an 800 or 880 number, a translation of the routing number will be performed to allow the call to be routed to the OSPS for billing validation. The format of the translated routing number will be ABC-WXY-NPAZ. This is similar to the number used for AATOS.

1.09   For those calls that require IBNS treatment, the *4ESS* switch ISC will either route them to the OSPS that homes directly on it or it will route them via Real Time Network Routing/Split Access Flexible Egress Routing (RTNR/SAFER) to the *4ESS* switch which contains the appropriate OSPS. In order to utilize the RTNR/SAFER capability for IBNS traffic, unique ABC-WXY codes are used to the IBNS traffic for the RTNR/SAFER routing treatment. Either way, the *4ESS* switch will access MF intertoll trunks to route these calls to the OSPS using Modified Feature Group C signaling protocols.

1.10   At the OSPS, the PTT operator-assisted call will be monitored for class of charge. The OSPS will send a query via Line Service Application (LSA) to LIDB to determine the terminating station type. At the same time, a query will be sent to the Network Access Interrupt (NAI) database to determine whether the call can be billed as a collect call. The call can be blocked by the OSPS operator if it is billed collect to a public station or denied by the NAI reply.

2. Call Flow

Key Points

2.01   The call flow for a typical international call with this feature activated is as follows:

- A caller in a foreign country reaches the PTT and indicates the desire to make a collect call to a line number in the United States.

- The PTT operator collects the called number NPA-NXX-XXXX and outpulses it through the PTT gateway switch to a gateway switch in the ASN.

- The call reaches the *4ESS* switch ISC. The ISC performs validity checks of the ABC and DEF digits and inspects the language information.

   ⇒ NOTE:
   The *4ESS* switch ISC performs validity checks on each inbound international call to ensure a valid set of ABC and DEF digits. This check is performed on data in the 3-digit type translator.

■ The language information has a value of 2 which indicates an operator-handled call. The *4ESS* switch ISC then checks the NPA of the routing number.

■ If the NPA of the routing number is less than 200, no special IBNS treatment is required. If the NPA is in the range of normal NPAs (200 and above except 800 or 880), the *4ESS* switch ISC will route the call to an OSPS that is homed on the originating ISC, or through RTNR/SAFER to reach an OSPS that is homed on a Terminating AT&T Switch (TAS) in the ASN.

■ If the originating ISC routes the call to another TAS to reach the OSPS, the ISC will forward the call with an AATOS type Called Party Number (ABC-WXY-NPAZ) and will place the original routing number (NPA-NXX-XXXX) in the charge number field of the IAM.

■ Using Modified Feature Group C signaling, the originating ISC or TAS routes the call through MF intertoll trunks to the OSPS. An AATOS type routing number 129-101-NPAZ followed by the 7-digit Automatic Number Identification (ANI) is used. The NPA of the original routing number NPA-NXX-XXXX is mapped to the 129-101-NPAZ routing number, and the remaining 7 digits, NXX-XXXX, are sent as the ANI.

■ The OSPS receives the call, analyzes the routing information, and recognizes the special 129-101-Z code as a request for special treatment.

■ The OSPS then launches a Transaction Capabilities Application Part (TCAP) BNS query to the LIDB, and a query to the NAI database, to determine whether the call can be billed as a collect call.

■ If the returned reply messages allow the collect call, the OSPS operator will proceed to connect the call. No Automatic Message Accounting (AMA) record will be made.

■ If the reply messages deny the collect call, the Call Treatment Indicator (CTI) is checked. If the CTI is set to "operator", the call will be seized at the operator position. The OSPS operator will inform the PTT operator that the call cannot be billed as a collect call. The OSPS operator will block the call if no alternate billing is provided. If alternate billing is provided, the OSPS operator will release the call and allow it to proceed to completion. A nonbillable AMA record is made after the call is disconnected by the customer.

■ If the reply message indicates that the call is denied but the CTI is set to "tone treatment", the OSPS will play a Cuckoo tone to warn the PTT operator that the call cannot be billed as a collect call. Then, if the PTT operator does not terminate the call immediately, the OSPS operator will proceed to complete the call. A nonbillable AMA record will be made as the caller disconnects the call.

3. Provisioning

⇒ NOTE:

The following Recent Change forms should be applied at the gateway *4ESS* switch ISC.

New Recent Change Form 6da

3.01 RC Form 6da (Figure 11-1) has been created to support this feature. It is used to add, change, or delete the 7-digit routing number (ABC-WXYZ) of IBNS calls to an OSPS office.

3.02 In effect, RC Form 6da is an input message that must be entered in the following format: **RC:MISC;FHT,FTA;IBNSROUTE,a,b,c,d!**. The uppercase letters represent data that must be entered as shown. The lowercase letters represent acronyms for variable fields that require input data.

3.03 The "a" field is for a unique order number in the range 000001 to 999999.

3.04 The "b" field specifies the required action: A (add), C (change), D (delete).

3.05 The "c" field must be specified as D to indicate inputting to IBNSROUTE data.

3.06 The "d" field is the 7-digit (ABC-WXYZ) routing number. All 7 digits of the routing number (range of 0 to 9) must be specified.

```
                        SAMPLE MESSAGES


1. To add a 7-digit number when none is currently specified:

   RC:MISC;FHT,FTA:IBNSROUTE,000001,A,D,97915851

2. To change a 7-digit number when one is currently specified:

   RC:MISC;FHT,FTA:IBNSROUTE,000002,C,D,97995851

3. To delete the 7-digit number when one is currently specified:

   RC:MISC;FHT,FTA:IBNSROUTE,000003,D,D,97995851


              EQUIVALENT ODA INPUT FORM - NONE

                ASSOCIATED VERIFY MESSAGES

            INPUT - 16da -VER:MISC:FHT IBNSROUTE

            OUTPUT - 6da - VER:MISC:FHT IBNSROUTE
```

Figure 11-1. Recent Change Form 6da

Affected Recent Change Forms

3.07 RC Form 301 (6-digit translation) is used to define the routing treatment for the 7-digit routing number ABC-WXYZ (129-101) at the gateway *4ESS* switch ISC.

3.08 RC Form 319 is used to set an indicator so that IBNS treatment will be disallowed for a specified NPA. The indicator is populated by the DT3 value in the DIGTYP field on RC Form 319. The default value will result in the routing of all NPAs to the OSPS.

3.09 RC Form 320 is used to delete the NPA selection that was made with RC Form 319.

3.10 RC Form 809 is used as an on/off switch for this feature. This feature will be active when the FEATURE ITEM field is populated with **PF8** and the ON/OFF field is set to **ON** on RC Form 809. The default value of the ON/OFF field is **OFF**.

3.11 Refer to "Turn On/Turn Off Mechanism" in this chapter for additional on/off data for this feature.

⚠ CAUTION:

Calls will be mistreated or incorrectly routed unless the following procedures are completed in the stated sequence before this feature is actived.

1. Determine or set up the correct routing to the OSPS office.

2. Populate the OSPS routing number via RC Form 6da.

3. Populate the NPAs which are NOT to be routed for IBNS screening via RC Form 319.

4. Use RC Form 809 to turn the feature on.

New Verify Forms 16da and 6da

3.12 Two new Verify forms have been created to support this feature. Verify Form 16da (Figure 11-2) is used to request verification of the 7-digit routing number of IBNS calls to an OSPS office. Verify Form 6da (Figure 11-3) is used to output the 7-digit routing number of IBNS calls to an OSPS office.

```
INPUT:                          VERIFY 16da


     ex. 1     VER:MISC:FHT IBNSROUTE! (EOT)




OUTPUT:                          VERIFY 6da

                       VER:MISC:FHT IBNSROUTE




                       ODA INPUT SOURCE-NONE
               RECENT CHANGE INPUT SOURCE-FORM #6da
```

Figure 11-2. Verify Form 6da

```
  INPUT:                      VERIFY #16da


VER:MISC:FHT IBNSROUTE:! (EOT)


OUTPUT:                       VERIFY 6da
VER:MISC:FHT IBNSROUTE:


ABC-WXYZ ROUTING NUMBER

-------


                      ODA INPUT SOURCE-NONE

RECENT CHANGE INPUT SOURCE-FORM #6da RC:MISC;FHT,FTA:INBSROUTE,a,b,c,d!
```

Figure 11-3. Verify Form 6da

Affected Verify Forms

3.13 Verify Forms 16az and 8j are used to verify the ON/OFF data populated on RC Form 809.

3.14 Verify Forms 13d and 3h are used to verify the IBNS treatment data populated on RC Forms 319 and 320.

4. Recording

4.01 The *4ESS* switch ISC will record the Originating Routing Number in the International Call Detail Record (ICDR).

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

6.01 A new Final Handling Code (FHC) 2061, IBNS Routing Number, is impacted by this feature. FHC 2061 indicates that the IBNS routing number used for inbound, international-terminating, operator-assisted calls failed to translate into a determinant call type.

6.02 As an example, an inbound, international-terminating, operator-assisted call, where the original incoming called party number was successfully translated and the call type was determined, was received. However, the IBNS treatment of rerouting the call via an IBNS Office Data Assembler (ODA) defined routing number failed. As a result, the *4ESS* switch will final handle the call using the vacant national number universal treatment.

⇛ NOTE:
If FHC 2061 is indicated, turn this feature off immediately (using RC Form 809) to avoid mistreating calls. Then determine the IBNS routing and provision it correctly. Refer to "Provisioning" in this chapter.

7. Transition Considerations

Software Dependencies

7.01 This feature depends on the following features:

■ *5ESS®* Switch, International Billed Number Screening, Release 2 feature

■ Inbound I800 Overseas 800 Access feature.

Ubiquity

7.02 It is not necessary for all *4ESS* switches in the network to be running the 4E20 Release 2 Generic for this feature to be operational.

Turn On/Turn Off Mechanism

7.03 This feature is turned on by populating the FEATURE ITEM field with **PF8** and setting the ON/OFF field to **ON** on RC Form 809 (but only after completion of the provisioning procedures listed below).

⚠ **CAUTION:**
Calls will be mistreated or incorrectly routed (resulting in FHC 2061, described above) unless the following procedures are completed in the sequence stated below before this feature is actived.

1. Determine or set up the correct routing to the OSPS office.

2. Populate the OSPS routing number via RC Form 6da.

3. Populate the NPAs which are NOT to be routed for IBNS screening via RC Form 319.

4. Use RC Form 809 to turn the feature on.

7.04   Additional on/off data for this feature is as follows:

⚠ CAUTION:
The OD4OFCCOPY structure contains on/off bits for many features. Be certain that any change you make will affect only this feature.

■   Structure: OD4OFCCOPY

■   Core address in the structure: 4E20 Generic 6731453

■   Size: 1

■   Displacement: 7

■   On: 1

■   Off: 0.

8. Input/Output Manual Pages

8.01   The following new input and output messages support this feature:

■   Input: VER:MISC:FHTIBNS

■   Output:VER:MISC-FHTIBNS

ID . . . . VER:MISC-FHTIBNS
WORK CENTER . . MAC, MOC
GENERIC . . . . . . 4E20 and later
CLASS . . . . VER
APPLICATION . . 4E
TYPE . . . . Input

1. PURPOSE

To output the ABC-WXYZ routing number for the international billed number screening (IBNS) capability.

2. FORMAT

VER:MISC:FHT IBNSROUTE!

3. EXPLANATION OF MESSAGE

None.

4. SYSTEM RESPONSE

PF   Printout follows.

5. REFERENCES

PIDENTs
IOCPIMC4
VRFYFHT

Output Messages
VER:MISC-FHTIBNS

ID . . . . VER:MISC-FHTIBNS
WORK CENTER . . MAC, MOC
GENERIC . . . . . . 4E20 and later
APPLICATION . . 4E
TYPE . . . . Output

1. FORMAT

```
VER:MISC:FHT IBNSROUTE:

ABC-WXYZ Routing Number

  aaa-aaaa
```

2. REASON FOR OUTPUT

The output is in response to the VER:MISC-FHTIBNS input message. This message displays the international billed number screening (IBNS) routing number.

3. VARIABLE FIELD DEFINITIONS

a   A seven digit routing number.

4. ACTION TO BE TAKEN

None.

5. REFERENCES

PIDENTs
 VRFYFHT

Input Message
 VER:MISC-FHTIBNS

Signaling Impact on Procedures for Tones and Announcements Feature (4449)

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Signaling Impact on Procedures for Tones and Announcements Feature (4449)

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1. Feature Description

1.01 This feature provides final handling treatments, initiated at the International Switching Center (ISC), for voiceband calls when an Address Complete Message (ACM) is followed by either:

- A backward Release (REL) message on an outgoing International Telephone and Telegraph Consulative Committee 7 (CCITT7) Integrated Services Digital Network User Part (ISUP) trunk, or

- An Unsuccessful Setup Backward Information Message (UBM) on an outgoing CCITT7 Telephone User Part (TUP) trunk.

1.02 If the ISC is directly connected to an access trunk, it will play a tone or announcement associated with the REL cause or UBM received at the outgoing trunk. If the call reached the ISC via an AT&T Toll Office, the ISC final handling treatment will send a Common Channel Signaling System 7 (CCS7) ISUP backward REL message with the appropriate cause to the Toll Office. Post-ACM final handling of REL messages at an AT&T Toll Office is allowed only for international calls. The Toll Office may connect an announcement or attempt to pass the REL message backward. The strategy is to play the announcement within the AT&T Switched Network (ASN) from the connecting office closest to the caller.

1.03 Emergency Feature 4344, Backward Release After Address Complete Message for International ISUP (INUP), is completely replaced by this feature.

1.04 Prior to this feature, the signaling sequence of an ACM followed by a REL message or a UBM was not defined in the ASN, although it is permitted within CCITT7 recommendations. AT&T is introducing CCITT7 ISUP signaling to an expanding number of countries where this signaling sequence is used. As a result of the incompatibility, some unsuccessful outbound international calls did not receive final handling treatment, and callers were not always notified of the treatment given to their calls.

1.05 This feature provides the following benefits:

■ Final handling of post-ACM backward REL messages or UBMs on international outbound or transit calls will improve customer perception of the ASN's performance by providing an appropriate final handling connection.

■ Final announcement treatments for post-ACM backward REL messages or UBMs on international calls will now be identical to existing pre-ACM backward REL message announcement treatments.

■ Trunk utilization will be improved as the result of the capability to receive and process a post-ACM Automatic Congestion Level indication in the CCITT7 ISUP REL message at the ISC.

■ This feature will improve the announcement time-out treatment on the Primary Rate Interface (PRI) by providing a Disconnect (DISC) with cause value 16 upon time-out.

Specific Capabilities

1.06 This feature provides post-ACM backward REL message, cause parameter dependent, final handling treatments for CCS7 ISUP and CCITT7 ISUP on international outbound or transit calls. It also provides post-ACM UBM message-dependent final handling treatments for CCITT7 TUP international outbound or transit calls. The final handling treatment given for a post-ACM backward REL message or UBM will duplicate the announcement treatment given if a backward REL message had occurred before an ACM was received.

1.07 Feature 4449 attempts to signal backward releasability wherever possible in the ASN, so that the final announcement will be played at the AT&T office that is closest to the entry point into the ASN. AT&T will not pass a post-ACM REL message across a Network Interconnect (NI) boundary. An AT&T ISC will pass back a CCITT7 ISUP post-ACM REL message if the call is transiting in, since the foreign administration should provide the announcement.

1.08   The following interworking between protocols at the ISC is supported by this feature. This means that the CCS7 ISUP, CCITT7 ISUP, or CCITT7 TUP protocol over which a post-ACM backward REL message or UBM is received must operate properly to produce a final announcement connection, as well as meet the conditions stated above.

1.09   The supported interworkings between protocols at the ISC are as follows:

- CCITT7 ISUP or TUP out interworking to CCITT7 ISUP in (transit)

- CCITT7 ISUP or TUP out interworking to CCITT7 TUP in (transit)

- CCITT7 ISUP or TUP out interworking to CCITT C5 in (transit)

- CCITT7 ISUP or TUP out interworking to CCS7 ISUP in (outbound or transit)

- CCITT7 ISUP or TUP out interworking to Q931 PRI in (direct-access outbound)

- CCITT7 ISUP or TUP out interworking to Common Channel Interoffice Signaling (CCIS6) in (outbound or transit)

- CCITT7 ISUP or TUP out interworking to inband signaling (MF, etc.) in (direct-access outbound)

- CCS7 ISUP out interworking to CCITT7 ISUP in (transit)

- CCS7 ISUP out interworking to CCITT7 TUP in (transit)

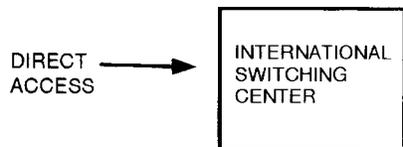- CCS7 ISUP out interworking to CCITT C5 in (transit)

1.10   This feature supports the following interworking between protocols at an AT&T Toll Office:

- CCS7 ISUP out interworking to CCS7 ISUP in (outbound or transit)

- CCS7 ISUP out interworking to CCIS6 in (outbound or transit)

- CCS7 ISUP out interworking to Q931 PRI in (outbound)

- CCS7 ISUP out interworking to inband signaling (MF, etc.) in (outbound)
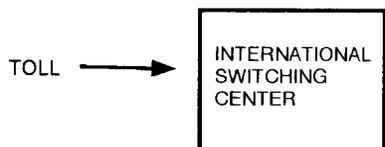
1.11   Figure 12-1 shows four signaling examples that apply to this feature:

- Example 1 shows direct access to an ISC.

- Example 2 applies to calls from a Toll Office to an ISC.

- Example 3 applies to transit calls through a Toll Office.

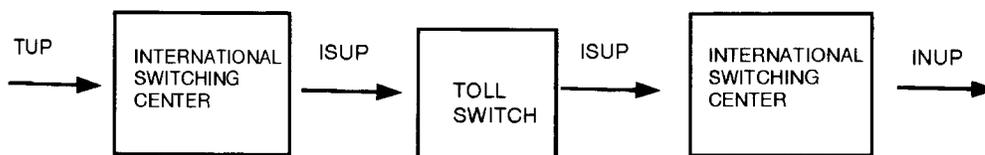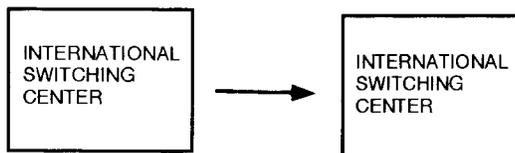- Example 4 shows transit calls with a dedicated international trunk.

EXAMPLE 1

```
DIRECT  ──────▶  ┌─────────────┐
ACCESS           │ INTERNATIONAL│
                 │ SWITCHING   │
                 │ CENTER      │
                 └─────────────┘
```

EXAMPLE 2

```
TOLL  ──────▶  ┌─────────────┐
               │ INTERNATIONAL│
               │ SWITCHING   │
               │ CENTER      │
               └─────────────┘
```

EXAMPLE 3

```
TUP  ┌─────────────┐  ISUP  ┌──────┐  ISUP  ┌─────────────┐  INUP
────▶│ INTERNATIONAL│──────▶│ TOLL │──────▶│ INTERNATIONAL│──────▶
     │ SWITCHING   │        │SWITCH│        │ SWITCHING   │
     │ CENTER      │        │      │        │ CENTER      │
     └─────────────┘        └──────┘        └─────────────┘
```

EXAMPLE 4

```
┌─────────────┐           ┌─────────────┐
│ INTERNATIONAL│           │ INTERNATIONAL│
│ SWITCHING   │──────────▶│ SWITCHING   │
│ CENTER      │           │ CENTER      │
└─────────────┘           └─────────────┘
```

Legend:

INUP - International Integrated Services
       Digital Network User Part
ISUP - Integrated Services Digital Network
       User Part
TUP - Telephone User Part

Figure 12-1. Examples of Affected Signaling Circuits

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1.12 A backward REL message with cause 16 will not receive final handling treatment. The REL message will be passed back across the network as far as possible. No tone or announcement is connected (matching current capability).

1.13 A backward REL message with cause 17 which terminates to an Integrated Services Digital Network (ISDN) PRI will be passed in a DISC with cause 17. No inband tone will be connected by the ISC/Toll switch (matching current capability).

1.14 Network Management will now accept post-ACM Automatic Congestion Level information to dynamically throttle traffic over the trunk subgroup if the foreign administration includes the Automatic Congestion Level parameter in the backward REL message. This parameter is optional, and it does not affect the final handling treatment given at the ISC in any way. The Automatic Congestion Level parameter is *NOT* passed backward into the the the domestic ASN.

1.15 The announcement time-out treatment given to ISDN PRI has been modified to send DISC with cause value 16 if time-out occurs. The previous cause value indicated timer expiration; the new cause value indicates that a normal disconnect is being initiated.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management

5.01 The backward REL message received on CCITT7 ISUP from a foreign telecommunications network could also carry the Automatic Congestion Level parameter. With this feature, the treatment of an Automatic Congestion Level parameter received in a backward REL message is independent of whether the REL message was preceded by an ACM or not.

6. Maintenance/Troubleshooting

Modified Final Handling Codes

6.01 There are 15 final handling codes that are impacted by this feature. All the codes will be defined in AT&T 234-010-316, *4ESS™ Switch, International Switching Center, Call-Irregularity Maintenance Reference Handbook*. However, this feature will modify the treatment descriptions for all the existing codes. In particular, an announcement connection or backward release signal may be sent, depending on the network configuration of the call. The final handling codes are organized by outgoing trunk signaling characteristics as follows:

- Outgoing Traffic ISUP—719, 720, 721, 722, 724

- Outgoing Traffic TUP—1571, 1572, 1573

- Outgoing Traffic INUP—1884, 1885, 1886, 1898, 1899, 1900, 1901.

7. Transition Considerations

Internal Transition Issues

7.01 As stated previously, this feature replaces Feature 4344.

7.02 It is recommended that the ISCs be the last to receive this feature. This is necessary to avoid situations where, as part of final handling, an ISC on 4E20 Release 2 could send a REL message to a Toll switch on 4E20 Release 1, and the Toll switch would not provide final handling treatment to the call.

Ubiquity

7.03 Because of the internal transition issue described above, it is recommended that all *4ESS* switches in the network be running the 4E20 Release 2 Generic in order for this feature to be fully operational.

Turn On/Turn Off Mechanism

7.04 As described above, the ISCs will be the last to receive this feature. There is no actual turn on mechanism. The feature will be turned on automatically with software deployment and activated by call activity on international trunks.

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8. Input/Output Manual Pages (Not Affected)

Software Defined Network 1+10 Digit Dialing on Dedicated Access Feature (4474)

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Software Defined Network 1+10 Digit Dialing on Dedicated Access Feature (4474)

13

1. Feature Description

1.01 The Software Defined Network (SDN) 1+10 Digit Dialing on Dedicated Access feature allows the *4ESS*™ switch to accept the prefix **1** when 10-digit North American Numbering Plan (NANP) numbers are dialed from dedicated access locations.

1.02 This option is available to customers on a Trunk Subgroup (TSG) basis using Dial Pulse (DP), Multifrequency (MF), and Dual Tone Multifrequency (DTMF) signaling. Multiple dialing plans are not allowed on the same TSG.

1.03 If the SDN line is busy, customers will no longer have to hang up and redial the number with a leading 1 to make the call over a POTS line.

1.04 This feature also eliminates the critical 8th digit timing to decide if an SDN 7-digit or NANP 10-digit number is dialed.

1.05 This feature is proprietary to AT&T.

2. Call Flow (Not Affected)

3. Provisioning

Structure Affected

3.01 A spare indicator is being defined in structure **HT43DIGTYP**. This indicator is associated with the first three digits of the called number on a (SDN) dedicated access trunk. Table 13-A describes the indicators.

Table 13-A. HT43DIGTYP Spare Indicator Descriptions

Item	Indicator	Description
XL43DT1		Delete the first digit of the called number (SDN call)
4XL3DTTRUE	1	Delete the digit
4XL3DTFALSE	0	Do not delete the digit (default)

Recent Change (RC) and Verification

A. RC Forms 100, 101, 107, and 108

3.02 The following forms, field **SDNPLAN**, are used to control the SDN 1+10 Digit feature:

- RC Form 100 (establishes the translations for a new 2-way TSG)

- RC Form 101 (establishes the translations for a new 1-way incoming TSG)

- RC Form 107 (changes translations for a 2-way TSG or converts a 1-way TSG to a 2-way TSG)

- RC Form 108 (changes the translations for a 1-way incoming TSG).

Valid entries are **NXX, PLUS,** and **OPEN**. For this feature, the TSG is changed from NXX to PLUS.

B. RC Form 319

3.03 RC Form 319 is used to specify codes to be added to a Digit Type (DT) category. For this feature, valid entries are as follows:

- DIGTYP = **DT1**

- DIG = **1NX** numbers.

C. RC Form 320

3.04 RC Form 320 is used to delete codes from a DT category.

D. Verify Form 13d

3.05 Verify Form 13d is used to request verification of the 3-digit type translator. The translator is used to determine if a code is in a particular translation category.

Limitations and Restrictions

3.06 If calls received from the Integrated Services Digital Network (ISDN) contain the prefix 1 in the Q.931 called party Information Element (IE), the call is final handled. The Final Handling Code (FHC) used is Vacant Code Announcement (VCA).

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Planning

7.01 Multiple SDNPLAN values cannot be provisioned on the same TSG (only one dialing plan is allowed for each TSG). The *4ESS* switch can process both types of digit strings (1+10 digit or 10 digit) using the pretranslator with the following exception.

If the...	And the...	Then the *4ESS* switch...
SDNPLAN is set to **PLUS**	Customer dials a 10-digit number whose leading 7 digits overlap with an SDN private 7-digit number	• Interprets the 10-digit number as if it were the 7-digit number and misroutes the call • Does not perform critical 8th digit timing if the SDNPLAN indicates **PLUS**.

Ubiquity

7.02 It is not necessary for all *4ESS* switches in the network to be running the 4E20 Release 2 Generic for this feature to be operational.

Turn On/Turn Off Mechanism

7.03 This feature is turned on by Recent Change. The DIGTYP field on RC Form 319 is populated with **DT1**. The DIG fields are populated with the appropriate **1NX** numbers. The SDNPLAN field (the 100 series of RC forms) which specifies the incoming TSG must also have the appropriate dialing plan populated (**PLUS**).

8. Input/Output Manual Pages (Not Affected)

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Routing and Billing for International 800 Service Calls from Mexico and the Caribbean Feature (4530)

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Routing and Billing for International 800 Service Calls from Mexico and the Caribbean Feature (4530)

14

1. Feature Description

1.01 Currently, Mexico and the Caribbean are assigned distinct Pseudo Country Codes (PCCs) for International 800 (I800) Service traffic. When this feature (Routing and Billing for International 800 Service Calls from Mexico and the Caribbean) is activated, the International Direct Distance Dialing (IDDD) Country Code (CC) will replace the PCC, and the End Office code (NXX) will be used to distinguish these two subregions.

1.02 To properly route and bill incoming I800 Service calls, the AT&T Switched Network (ASN) uses the appropriate ranges of NXX values to identify the call location. The CC is obtained from the Far End Numbering Plan Area (FENPA) field while the NXX parameter is obtained from the Far End Office (FEOFC) field of the incoming Trunk Subgroup (TSG) characteristics.

1.03 Table 14-A lists the conversion of the received Dialed Number (DN) from a Foreign Subscriber Identification Telephone (FSIT) number or 800+7D format.

Table 14-A. Dialed Number Conversion

Subregion	CC	DN Format	Converted Number
Mexico	052	FSIT or 800+7D	052-NXX-0000
Caribbean	809		809-NXX-0000

1.04 The Transaction Capabilities Application Part (TCAP) BEGIN message containing the Digits(ANI) [Automatic Number Identification] parameter is sent to the 2 Direct Services Dialing (DSD) Network Control Point (NCP). In the case of the Alternate Destination Routing 2 (ADR2) feature, the UNIdirectional (UNI) message has the Digits(ANI) parameter populated with either 809-NXX-0000 or 052-NXX-0000 along with the appropriate CC and Foreign Administration Identifier (FAI) parameters.

1.05 This feature is proprietary to AT&T.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording

4.01 For the DN=FSIT/800+7D formats, the ANI is recorded as either 052-NXX-0000 or 809-NXX-0000. When a hand-off is required, the following information is recorded after receiving the Charge-Bill Call operation with the optional parameters IDDD CC (809/052) and ANI:

■ The Originating ANI (either 809-NXX-0000 or 052-NXX-0000) in the Originating NPA (ONPA)/Number fields.

■ The Originating Numbering Plan Type with the value IDDD CC=3.

4.02 When a hand-off is not required and the call is I800, the following is recorded:

■ The Originating IDDD Country Code (either 809-NXX-0000 or 052-NXX-0000) in the ONPA/Number fields. This information is obtained from the FENPA (809/052) and FEOFC fields.

■ The Originating Numbering Plan Type with the value IDDD CC=3.

5. Network Management

Operations Support Systems

5.01 Table 14-B describes the Operations Support Systems (OSSs) affected by this feature.

Table 14-B. Service and Operations Support Systems Affected

Service/OSS	Use
GTN Support System (GSS)	When the IDDD CC or PCC parameter is present, automatically uses the NXX information to selectively screen and block calls from specific service areas or countries.
Network Support System (NSS)	Supplies GSS with all valid Mexican 052-NXXs and Caribbean 809-NXXs in the NPA-NXX feed.
Call Attempt Data Collection System (CADCS)	Accepts call attempt records (containing the entire ANI) from the 2DSD for I800 Service calls originating in Mexico.

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Dependencies

7.01 This feature is dependent on the following 4E18 Release 3 Generic features:

- 3957, Inbound International 800 Service Separation of Country Code from Network Routing Number

- 4170, Inbound International 800 Service Overseas Access.

Ubiquity

7.02 It is not necessary for all *4ESS* switches in the network to be running the 4E20 Release 2 Generic for this feature to be operational.

Turn On/Turn Off Mechanism

7.03 This feature is turned on automatically by software deployment.

8. Input/Output Manual Pages (Not Affected)

Self-Provisioning Global Title Translation (SPGTT) Table Expansion Feature (4538)

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Self-Provisioning Global Title Translation (SPGTT) Table Expansion Feature (4538)

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1. Feature Description

1.01 The Self-Provisioning Global Title Translation (SPGTT) feature (4032) was introduced into the *4ESS*™ switch in the 4E18/4E19 Release 2 Generic. This feature provided a fast and cost-effective method for provisioning Software Defined Network (SDN) Global Title Translation (GTT) records in the *4ESS* switch.

1.02 One of the components of SPGTT is the GTT table in the Direct Link Node (DLN). The GTT table maps an Automatic Number Identification (ANI) range to a Customer ID and the point codes/subsystem numbers of the Network Control Points (NCPs) that contain a customer's records.

1.03 The SPGTT Table Expansion feature makes some enhancements to the original SPGTT feature. Originally, the maximum number of NCPs that could be identified by the GTT table was 128. This feature increases the number of NCPs to 256. Also, this feature increases the number of unique NCP point code/subsystem number combinations per Customer ID from 3 to 8.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

Measurements

6.01 This feature adds a mechanism for troubleshooting and analyzing blocked calls. To track the number of SDN calls blocked due to Common Channel Signaling System 7 (CCS7) problems, the *4ESS* switch will keep a count of the number of incompleted calls with a Final Handling Code (FHC) of 1698.

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS* switches in the network to be running the 4E20 Release 2 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

7.02 This feature is turned on automatically by software deployment.

8. Input/Output Manual Pages (Not Affected)

Software Defined Network (SDN) Access Numbering Plan Area (NPA) Table Feature (4540)

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Software Defined Network (SDN) Access Numbering Plan Area (NPA) Table Feature (4540)

16

1. Feature Description

1.01 The Software Defined Network (SDN) Access Numbering Plan Area (NPA) Table feature is an enhancement to the 10288 Access to SDN feature (3857). The purpose of this feature is to reduce the number of queries made to the Universal Global Translator (UGT) database.

1.02 The screening logic applied by the 10288 Access to SDN feature adequately handles most calls; however, one type of call that it does not handle is a call from a dual-homed customer. A dual-homed customer is a customer that is homed to two different *4ESS*™ switches. For calls leaving the AT&T Switched Network (ASN), that is, an egress call, the customer is homed to one *4ESS* switch. For calls going to the ASN, that is, an access call, the customer is homed to a different *4ESS* switch. Existing Home/Served NPA tables are based on egress calls. Therefore, whenever a dual-homed customer makes a call, all the SDN screening takes place (including a query of the UGT database) before it is determined that the caller is not an SDN customer and normal call handling should be applied to the call.

1.03 The SDN Access NPA Table feature creates a table referred to as the Access NPA (ANPA) table to handle dual-homed customers. The ANPA table, a superset of the Home/Served NPA table, is created by adding a new entry (ANPA) in the 3 Digit Type table. Included in the ANPA table are access NPAs for customers who are dual homed. The ANPA entry indicates whether or not the customer's NPA is served by the *4ESS* switch.

1.04 This feature also creates a flag that allows the UGT database to be queried much earlier in the call flow process. The flag is referred to as the "Query_UGT" Flag. If this flag is set to YES, the UGT database is queried directly if the customer's Automatic Number Identification (ANI) is not in the ANI trigger table and the NPA of the ANI is not in the ANPA table.

2. Call Flow

2.01 When the *4ESS* switch receives a call on a 10288 access trunk, the digits are analyzed and the ANI trigger table is searched for the caller's ANI. Table 16-A describes the events that then take place.

Table 16-A. 10288 Access to SDN Call Flow

If...	Then...
A matching ANI is found and the SDN indicator is set	The call is processed as an SDN call.
A matching ANI record is NOT found in the ANI trigger table	The Home/Served table is searched for the NPA of the ANI.
The NPA is found in the Home/Served table	The call is processed as a POTS call.
The NPA is NOT found in the Home/Served table	The Access NPA table is searched for the NPA of the ANI.
The NPA is found in the Access NPA table	The call is processed as a POTS call.
The NPA is NOT found in the Access NPA table and the "Query_UGT" Flag is set to YES	The UGT database is searched for the ANI.
A customer record is found for the ANI	A query is sent to the SDN database for processing.
If the "Query_UGT" Flag is set to NO	Normal call handling is applied to the call.

3. Provisioning

3.01 DT2, a spare 3 Digit Type (DIGTYPE), is being used to identify the NPAs that should receive normal call handling. 3 Digit Types are populated using Recent Change (RC) Form 319.

3.02 The "Query_UGT" Flag is set to YES or NO using RC Form 810.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS* switches in the network to be running the 4E20 Release 2 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

7.02 This feature is turned on using RC Form 809. To turn the feature on, enter **PF7** in the FEATURE ITEM field on RC Form 809 and **ON** in the ON OR OFF field.
To turn the feature off, enter **PF7** in the FEATURE ITEM field on RC Form 809 and **OFF** in the ON OR OFF field. Default for this feature is "Off", that is, not active.

7.03 This feature can also be turned on or off by an absolute word change. Item OD4PF7 in Office Data Assembler (ODA) structure OD4OFCCOPY is the office parameter that dictates whether or not SDN screening should be applied to an SDN call.

⚠ CAUTION:
The OD4OFCCOPY structure also contains the on/off bits for many other features. Be certain that the change you make affects only this feature.

7.04 The following is the information needed to turn the feature on or off using an absolute word change:

- Structure: OD4OFCCOPY

- Core address in 4E20 Generic: 6731453

- Size of OD4PF7: 1

- Displacement of OD4PF7: 6

- On: 1

- Off: 0

8. Input/Output Manual Pages (Not Affected)

AT&T Trigger Platform Jr.—Busy/Ring No Answer Feature (4555)

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AT&T Trigger Platform Jr.— Busy/Ring No Answer Feature (4555)

17

1. Feature Description

1.01 The Software Defined Network—Network Remote Access (SDN-NRA) Using Automatic Speech Recognition (ASR) feature requires that inband busy and ringing be monitored as triggers. Currently, these initiators have no hardware support and are hard coded to "Busy/Ringing Not Allowed."

1.02 When Feature 4555 is activated, inband ringing and busy will be monitored as triggers when inband monitoring is enabled.

1.03 This feature is proprietary to AT&T.

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

Dependencies

A. Hardware

7.01 For this feature to operate, the *4ESS*™ switch must be equipped with a Service Circuit System (SCS). The AT&T Trigger Platform (ATP) Service Circuit Unit (SCU) must contain two Multisignal Processor (MSP) circuit packs (TN1589). The first circuit pack is the default pack. The second circuit pack is installed (horizontal position 072) for the Busy/Ring No Answer feature. Refer to Task Oriented Practice (TOP), AT&T 234-153-060AC, *Service Circuit System (SCS) Growth, 4ESS*™ *Switch.*

B. Software

7.02 This feature is dependent on 4E20 Release 1 Generic Feature 4306, AT&T Trigger Platform, Jr.

Ubiquity

7.03 It is not necessary for all *4ESS* switches in the network to be running the 4E20 Release 2 Generic for this feature to be operational.

Turn On/Turn Off Mechanism

7.04 This feature cannot be deployed unless an additional circuit pack is inserted into the ATP SCU. Additionally, the ATP 1B Processor bit must be populated on Recent Change Form 809 (activated in the 4E20 Release 1 Generic).

8. Input/Output Manual Pages (Not Affected)

Interim 1+500 Via the *4ESS*™ Switch Feature (4575)

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Interim 1+500 Via the *4ESS*™ Switch Feature (4575)

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1. Feature Description

1.01 The AT&T Switched Network (ASN) began providing personal number service based on 500 numbers to subscribers of *Easy Reach*® and *True Connections*℠ services beginning in November 1994. Previously, those services were based on processing at the *5ESS*® switch Operator Services Position System (OSPS). The current feature is based on an interim architecture which allows 1+500 calls to be routed through selected *4ESS*™ switches while 0+500 calls are routed through the *5ESS* switch OSPS. The 1+500 calls come to the *4ESS* switch and then are routed through a Via AT&T Switch (VAS) to a collocated *5ESS* switch OSPS, with subsequent *Easy Reach* and *True Connections* services processing as if the call had been routed initially to the *5ESS* switch OSPS.

1.02 The term "interim" is used because another solution based on a different architecture is introduced in the 4E20 Release 2 Generic. See Chapter 9 for information about that feature (4324). The interim feature has advantages in terms of time to market for 1+500 services, but the architecture used in Feature 4324 reduces call setup delay and allows feature interaction between 1+ features and *Easy Reach* service features.

1.03 With the interim feature, the *4ESS* switch routes 1+500 calls by way of a specific VAS to four "serving" *4ESS* switches that are collocated with *5ESS* switches OSPS. The calls must be routed to one of the four *5ESS* switches OSPS using Feature Group D (FG D) MF signaling on a dedicated trunk subgroup (TSG).

1.04 The *4ESS* switch sends the 1+500 calls on dedicated 2-way FG D trunks with
Automatic Number Identification (ANI), destination number, and Information
Indicator (II) digits. If the NPA-NXX is "foreign" to the *5ESS* switch OSPS, the *5ESS*
switch OSPS obtains screening information using the Automatic Inward Line Screening
(AILS) feature and then processes the calls as normal *Easy Reach* service calls.

1.05 The following are the selected pairs of Terminating AT&T Switches (TAS) and
collocated *5ESS* switches OSPS:

Location	*4ESS* Switch	*5ESS* Switch OSPS
St. Louis, MO	STLMO0934T	STLSMO0905T
New York City, NY	NYCMNYBW51T	NYCMNYBW26T
Atlanta, GA	ATLNGANW05T	ATLNGANW06T
Stockton, CA	SKTNCA0107T	SKTNCA0105T

2. Call Flow

2.01 This interim feature is designed to be used until the deployment of the *Easy
Reach* service 1+500 Dialing Plan, Feature 4324, in the 4E20 Release 2 Generic.
Since some switches may use the interim feature for some time before turning on
Feature 4324, the following call flow diagram and call flow description are included to
allow comparison between the two features, which are quite different in architecture.

Call Flow Diagram

2.02 The call flow for the Interim 1+500 Via the *4ESS* Switch feature is illustrated in
Figure 18-1.
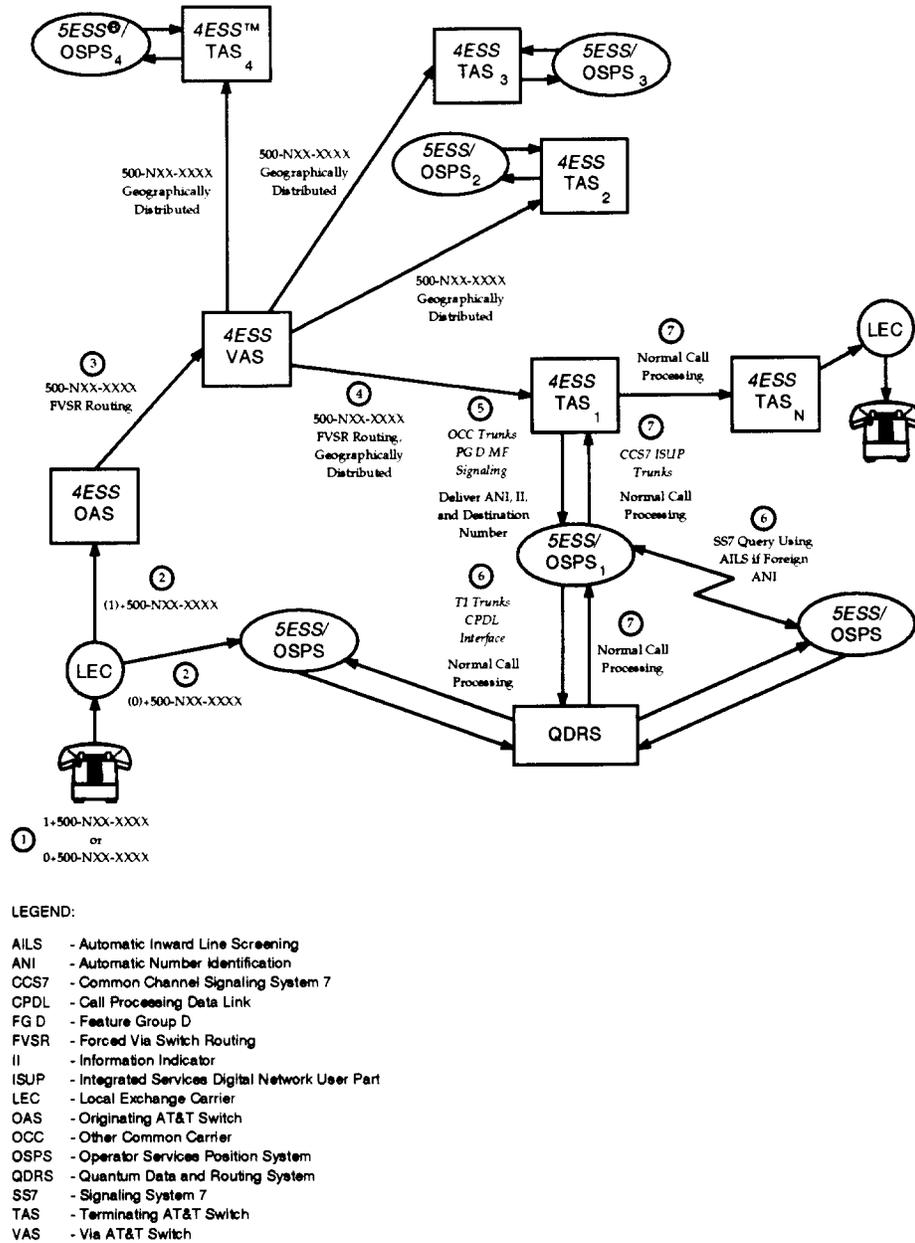
Figure 18-1. Network Architecture and Call Flow

Call Flow Narrative

2.03 The call flow for the Interim 1+500 Via the *4ESS* Switch feature is as follows:

1. The caller dials a number of the form 1+500-NXX-XXXX or 0+500-NXX-XXXX from a switched-access location.

2. Based on the NXX of the destination number (500 number), the Local Exchange Carrier (LEC) recognizes 1+500 calls destined to the ASN and forwards them to a *4ESS* toll switch. The 0+500 calls destined to the ASN are directly forwarded to a *5ESS* switch OSPS. Direct-dialed calls from coin-operated or hotel phones are blocked by the *5ESS* switch OSPS.

   (The remainder of this call flow describes only the 1+500 calls arriving at the *4ESS* switch, since the 500 calls received at the *5ESS* switch OSPS are treated the same as 0+700 *Easy Reach* service calls.)

3. The Originating AT&T Switch (OAS) receives the call and does the following:

   a. Derives the Class of Service parameters and takes appropriate action.

   b. Translates the first 6 digits of the destination in the Plain Old Telephone Service (POTS) domain and determines the Network Switch Number (NSN) of the TAS for the 500 call to be routed via a specific VAS.

   c. Using Forced Via Switch Routing, routes the 500 call from the OAS to the TAS via the specific VAS. If the 500-NXX code does not exist in the OAS, then the call will be final handled; that is, the call will receive a Vacant Code Announcement (VCA).

   d. Sends the Common Channel Signaling System 7 (CCS7) Integrated Services Digital Network User Part (ISUP) Initial Address Message (IAM) needed to route the call.

   e. Generates an Automatic Message Accounting (AMA) billing record.

4. The VAS receives the 500 call and routes it to the designated TAS. The NSN of the TAS is forwarded to the VAS by the OAS, based on the geographic location of the OAS. This TAS is collocated with a *5ESS* switch OSPS.

5. The TAS performs 6-digit translation on the destination number and routes the call to the collocated *5ESS* switch OSPS, using dedicated FG D trunks. The TAS then maps the Originating Line Information (OLI) parameter value to the II digits and delivers the destination number, ANI, and II digits to the *5ESS* switch OSPS using FG D signaling on Other Common Carrier (OCC) trunks.

6. When the *5ESS* switch OSPS receives this information from the TAS and finds a foreign ANI, it applies AILS using Signaling System 7 (SS7) to query the home *5ESS* switch OSPS for screening information. On receiving the ANI information, the *5ESS* switch OSPS delivers the 500 call with the destination number and ANI as a new call to the Quantum Data and Routing System (QDRS) platform.

7. The QDRS platform and the *5ESS* switch OSPS process the call as a normal *Easy Reach* service call based on the 500 number.

3. Provisioning

3.01 This feature was released to the field as a software overwrite in late 1994. Since the switches that are using the feature have already been provisioned and the feature that will replace this one is also part of the 4E20 Release 2 Generic, a general description of the required provisioning is provided here. The recent changes required are all documented in the *4ESS* Switch Translation Guide (TG-4).

3.02 The following describes the Recent Changes (RCs) required at a *4ESS* switch to signal Equal Access Multifrequency (EAMF) to an OSPS connected to it:

1. Build an outgoing TSG to OSPS capable of signaling EAMF, using RC Form 100 or 102. The required characteristics for this feature are the following:

    ■ OSC=MFWINK

    ■ TOT=OCC

2. Add trunks to the TSG, using RC Form 200.

3. Using RC Form 500, create a Routing Data Block (RDB) for routing calls to the OSPS using the TSG defined above.

4. Build a new Far End Network (FEN) (RC Form 617) to be used for measurements. The FENCLASS must be ACCESSA and the FEN Identification (FID) must be 3 numeric digits. The FID would normally contain the carrier ID. The Service Category treatments should be set to N, and the Screen Treatments fields should be left blank.

5. Create a Number Data Block (NDB), using RC Form 524. The required fields are the following:

    ■ NDB   Number Services Routing (NSR) Data Block (1-1023)

    ■ FENCLASS   ACCESSA

    ■ FENID   FID created in Step 4 above

    ■ RDBI   RDB created in Step 3 above

- ■ NXZZ   00 (not used in signaling to OSPS)
- ■ NNDB   Blank
- ■ FG   D
- ■ ANI   Y
- ■ CPN   Y
- ■ PATH   DIR
- ■ INTL   N.

6. Create routing (RC Form 300 or 301) in the POTS domain for the 500/500NXX using a Service Switching Point (SSP) Route Direct (RT) call type. The required fields are the following:

- ■ DOM   POTS
- ■ NTD   Number of Translated Digits
- ■ AC   Y
- ■ OLD   Old calltype data
- ■ NEW   New calltype data
- ■ CALLTYPE   SSP
- ■ CALLDATA   RT
- ■ AD1   Type of Service (TOS) 1-31
- ■ AD2   Carrier ID (CID), with a leading zero (for example, 0288)
- ■ ADC   10 Acceptable Digit Count
- ■ ABC   500
- ■ DEF   Enter NXX if doing 6-digit translation.

7. Create the NSR domain, using RC Form 309.

8. Change the number of digits to be translated in the NSR domain from 3 to 4 digits for the CID, using RC Form 311. The required fields are the following:

- ■ DOM   NSR
- ■ AC   Blank
- ■ OLD NTD   3
- ■ NEW NTD   4
- ■ CODEGRP   First 3 digits of the CID specified on the SSP RT call type (for example, 028).

9. Create routing in the NSR domain, using RC Form 301, for the CID used on the SSP RT call type. The "ABC" will be the first 3 digits of the CID, and "D" will be the last digit of the CID. The required fields are the following:

- DOM   NSR
- NTD   4
- AC   Blank
- OLD   Old calltype data
- NEW   Following is the new calltype data
- CALLTYPE   SSP
- CALLDATA   NDB
- AD1   NDBI NDB number created in Step 5 above
- CHI   ND
- DESEP   1-255
- ADC   4,5,6,7.

10. Overwrite the HT4CAMAI table default entry so that II digits of 00 will be sent to the OSPS if Originating Line Identifier (OLI) is not received. The entries in the HT4CAMAI table are 2 TELCO BCD digits. Overwrite the first entry in the table from II digits of 23 (00000043) to II digits of 00 (00000252). The addresses of the HT4CAMAI table are the following:

- 4E19R1   6767052
- 4E20R1   6773540

First dump the data at the address. For 4E20R1, the command would be **DUMP:CSS,ADR6773540,L 1!**. The data should show 00000043. Then overwrite the data to II digits of 00, and copy and update the hash data as follows:

- IN:OWBUF:ADR 6773540,DATA 00000252!
- COPY:OWBUF!
- UPD:HDATA!

11. Make entries at the OASs to route 500NXX to the appropriate TAS connected to an OSPS.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

7.01 Ubiquity of the release throughout the network is not required for the operation of this feature. However, the four Via switches must be in place to route 1+500 calls to the OSPS at the collocated *5ESS* switches.

Turn On/Turn Off Mechanism

7.02 This feature was released as a software overwrite between regularly scheduled releases, and provisioning has already been completed in all switches that will use it.

8. Input/Output Manual Pages (Not Affected)

Predictive Zero Maintenance (PZM)-Triggered iPCC Gateway Orders Feature (4579)

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Contents

Predictive Zero Maintenance (PZM)-Triggered iPCC Gateway Orders Feature (4579)

19

1. Feature Description

1.01   The Predictive Zero Maintenance (PZM)-Triggered Individual Per-Call Control (iPCC) Gateway Orders feature (4579) is a 4E18 Release 4 Generic feature. For documentation purposes, it is being included in the AT&T 234-090-202AC, *4ESS*™ *Switch, Product Release Document, 4E20 Release 2 Generic.*

1.02   This feature offers an enhanced testing and troubleshooting capability in the *4ESS* switch for the Transmitted Noise Reduction (TNR) feature (4386) and the iPCC feature (3795). The purpose of Feature 4579 is to provide a means for Testing Operations Provisioning Administration System (TOPAS) or office personnel to send Start-of-Call and End-of-Call messages to the iPCC Gateway and the Universal Services Echo Canceler (USEC). TOPAS is an on-line trunk provisioning system that performs trunking and trunk testing in AT&T's core network. The iPCC Gateway is a stand-alone device located in the *4ESS* switch central office. The iPCC architecture provides a communication link, via an iPCC Gateway, between the *4ESS* switch and the USEC. The iPCC requires dual Special Access Data Channel (SADC) nodes on the Common Network Interface ring and a dedicated Common Processor port on each USEC frame. The USEC is the platform for enhanced voice quality.

1.03   Feature 4579 instructs the *4ESS* switch to send a Start-of-Call message or End-of-Call message through the iPCC Gateway for a designated trunk. This feature allows TOPAS or office personnel to input a TTY command that causes an iPCC Start-of-Call message (START) or End-of-Call message (END) to be sent via the iPCC Gateway to the USEC to be used in various test scenarios. Once the message is received at the iPCC Gateway, the message is then sent to the USEC. (The *4ESS* switch sends the message to the Gateway, and the Gateway sends the message to the

appropriate USEC frame.) If for some reason the message cannot be sent to the USEC, the requesting TTY channel will receive a failure message, and the message processing is terminated. Start-of-Call and End-of-Call commands can be received over several channels, including TOPAS channels, Test Control Area (TCA) channels, Maintenance (MTC) channels, and Secondary Records (SREC) channels.

1.04 Feature 4579 supports both the iPCC feature and the TNR feature. However, the iPCC and TNR features do not have to be activated in the *4ESS* switch for Feature 4579 to work. Testing can be performed regardless of the state (ON/OFF) of the iPCC and TNR feature settings. The iPCC feature (3795) was introduced in the 4E17 Release 4 Generic. The TNR feature (4386) was introduced in the 4E18 Release 4 Generic.

2. Call Flow (Not Affected)

3. Provisioning

Recent Change Form 210

3.01 The existing Recent Change Form 210 supports the PZM-Triggered iPCC Gateway Orders feature. This form is used to assign the Trunk Appearance Number (TAN) to the Per-Call Control USEC assignment. Recent Change Form 210 must be populated with the appropriate TAN to initiate USEC iPCC testing on a designated trunk using Feature 4579.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

Measurements

6.01 No measurement counts for an iPCC Gateway message are pegged when the message that is initiated by a Start-of-Call or End-of-Call command is received.

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Trunk Test

6.02 There are no new or special testing requirements for this feature.

6.03 A new test Input/Output (I/O) message, **ORD:USEC**, is associated with Feature 4579. This message is used to send test orders to the USEC on a per-trunk basis. Trunks can be either iPCC-equipped or TNR-equipped, based on the signaling characteristic. If the input trunk is not associated with a USEC during testing (that is, the trunk is not equipped for iPCC or TNR), message processing will terminate, and a "TRK NOT USEC EQPD" message is issued to the requesting TTY channel. Also, if the transport to the USEC is not available (that is, the Gateway and/or SADC is out of service), message processing will terminate, and a "TRANSPORT UNAVAILABLE" message is issued to the requesting TTY channel. The "TRK NOT USEC EQPD" and "TRANSPORT UNAVAILABLE" messages are new text phrases that may be output when the PZM-Triggered iPCC Gateway Orders feature is operational.

⧩ NOTE:

Since there is no handshaking between the *4ESS* switch and the iPCC Gateway regarding successful message delivery, the *4ESS* switch will not proactively tell TOPAS when a message is successfully transmitted.

7. Transition Considerations

Dependencies on Other Network Components

7.01 This feature depends on TOPAS/PZM to perform on-line trunk testing and provisioning on designated trunks.

Ubiquity

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

Turn On/Turn Off Mechanism

7.03 The PZM-Triggered iPCC Gateway Orders feature has no specific turn-on or turn-off mechanism. This feature is a test-related only capability desired for TNR. Therefore, a Start-of-Call or End-of-Call command from TOPAS initiates the message testing process.

8. Input/Output Manual Pages

8.01 A new input message, **ORD:USEC**, has been created for use with Feature 4579. This input message has two formats: one for the Start-of-Call command and the other for the End-of-Call command. Refer to the Input manual page for the formats of a non-TOPAS message input and an explanation of the message. The formats of a TOPAS message input are as follows:

Format 1: **ORD:USEC;START[,MTCE] [,ES]:{CIN a!TSN b!TAN c!OTAN d} [,TAG e]!**

Format 2: **ORD:USEC;END:{CIN a!TSN b!TAN c!OTAN d} [,TAG e]!**

➡ **NOTE:**
A TAG is required for a TOPAS message input and message output.

8.02 When the START keyword is input, the Start-of-Call indicator is set, and the ENH (Enhancement) bit is set based on whether the trunk is iPCC- or TNR-equipped. If the trunk is iPCC-equipped, the Enhancement will be disabled. If the trunk is TNR-equipped, the Enhancement will be enabled.

8.03 When the MTCE (Maintenance) keyword is input in a Start-of-Call command, the MTCE indicator is set to "Maintenance" in the order. This is only valid for iPCC-equipped trunks. If the MTCE keyword is input for TNR-equipped trunks, requests to send orders are denied.

8.04 The ES (End Switch) keyword is only applicable for iPCC-equipped trunks. ES is not required for TNR-equipped trunks. However, the ES keyword indicator is set to "End Switch" for TNR-equipped trunks. If the ES keyword is input for iPCC-equipped trunks, the "End Switch" indicator in the order will indicate "End" switch. If the ES keyword is not input, the "End Switch" indicator in the order will indicate "Via" switch.

8.05 Two new output message (**ORD:USEC** for a TOPAS request and **ORD:USEC** for a TCA, SREC, or MTC request) are required with Feature 4579. Refer to the Output manual page for the format of a non-TOPAS message output and the variable field definitions. The format of a TOPAS message output is as follows:

ORD:USEC;f,g:OTAN d [TAG e] h

8.06 The variable field definitions for a TOPAS message output are as follows:

f =   Message Type: START (Start-of-Call) or END (End-of-Call)

g =   MTCE, if the MTCE keyword was entered in the input message. Otherwise, this field is Null.

h =   COMPLETED - SUCCESS (Test was successfully completed.)

ILLEGAL OPERATION (MTCE keyword is input for a TNR trunk.)

CIRCUIT IN INVALID STATE (Trunk is not in the proper state.)

TRK NOT USEC EQPD (Trunk is not equipped for iPCC or TNR.)

TRANSPORT UNAVAILABLE (Gateway is out of service; SADC is out of service.)

CMS SYNTAX FAILURE DUMP (Indicates a message syntax error.)

ID . . . . ORD:USEC
WORK CENTER. . MOC, TEC, TOC
GENERIC . . . . . . 4E19 and later
CLASS . . . . TMTC
APPLICATION . . 4E
TYPE . . . . Input

1. PURPOSE

The purpose of this message is to send either "start of call" or "end of call" orders to the universal services echo canceller (USEC) frame for either individual per call control (iPCC) or transmitted noise reduction (TNR) type trunks. Optionally, for iPCC trunks, the maintenance (MTCE) and end switch (ES) indicators can also be sent in the "start of call" message.

2. FORMAT

[1] **ORD:USEC;START[,MTCE][,ES]:{CIN a|TSN b|TAN c|OTAN d}!**

[2] **ORD:USEC;END:{CIN a|TSN b|TAN c|OTAN d}!**

3. EXPLANATION OF MESSAGE

a	Circuit identification number (**CIN**) of trunk.
b	Trunk scanner number (**TSN**) of trunk.
c	TSI-SPC-PORT-CHANNEL trunk appearance number (**TAN**) of trunk:

CHANNEL — A 3-digit decimal number indicating channel, range 0-127.

PORT — A 1-digit decimal number indicating port of time slot interchange (TSI), range 0-6.

SPC — A 1-digit decimal number indicating SP of TSI, range 0-1.

TSI — A 2-digit decimal number indicating the time slot interchange (TSI) member number, range 00-63.

d	Seven-digit octal **TAN** (**OTAN**) of trunk.
MTCE	When the MTCE indicator is specified, then the "start of call" order will contain the maintenance indicator set to on.
ES	When the end switch (ES) indicator is specified, then the "start of call" order will specify the end switch value as end switch, otherwise the end switch will be specified as a via switch (this is only applicable for iPCC trunks)

4. SYSTEM RESPONSE

?D   Invalid input data present. One of the following conditions occurred:
Neither **START** nor **END** keywords were input.
Both **START** and **END** keywords were input.
The **END** and the **MTCE** keyword were both input.

PF   Printout follows.

5. REFERENCES

PIDENTs
 IPCC
 TMAD0005

Output Message
 ORD:USEC

ID . . . . ORD:USEC
WORK CENTER . . MOC, TEC, TOC
GENERIC . . . . . . 4E19 and later
APPLICATION . . 4E
TYPE . . . . Output

1. FORMAT

ORD:USEC;a[,MTCE][,ES]:b c

2. REASON FOR OUTPUT

To respond to an ORD:USEC input message.

3. VARIABLE FIELD DEFINITIONS

a   Message type:

                            END — End of call.

                            START — Start of call.

MTCE   Optional maintenance indicator.

ES   Optional end switch indicator.

b   Trunk identifier:

                            CIN   — Circuit identification number.

                            OTAN — Octal trunk appearance number.

                            TAN   — Decimal trunk appearance number.

                            TSN   — Trunk scanner number.

c   Test result:

                            COMPLETED - SUCCESS   — Test successfully completed.

                            ILLEGAL OPERATION   — MTCE or ES keywords specified for
                            transmitted noise reduction (TNR) trunks.

                            TRANSPORT UNAVAILABLE   — Transport to the universal services
                            echo canceller (USEC) is unavailable.

                            TRK NOT USEC EQPD   — Trunk is not assigned to a USEC.

4. ACTION TO BE TAKEN

None - message is informational.

5. REFERENCES

PIDENT
IPCC
TMAD0005

Input Message
ORD : USEC

Abbreviations and Acronyms

A

AATOS
Alternate Access To Operator Service

ABC
Adjunct Based Capability

ACG
Automatic Call Gap

ACM
Address Complete Message

ACPN
Analyze Called Party Number

AILS
Automatic Inward Line Screening

AIN
Advanced Intelligent Network

ALA
Adjunct Logical Address

AMA
Automatic Message Accounting

ANI
Automatic Number Identification

ANPA
Access Numbering Plan Area

API
Attached Processor Interface

APN
Action Point Numbering

APS
Attached Processor System

ASCIT
AT&T Service/Call ID Type

ASM-Plus
Announcement System Manager—Plus

ASN
AT&T Switched Network

ASR
Automatic Speech Recognition

ATP
AT&T Trigger Platform

B

B/RNA
Busy/Ring No Answer

BCS
Business Communications Service

BLDS
Business Long Distance Service

C

CADCS
Call Attempt Data Collection System

CC
Country Code

CCIS6
Common Channel Interoffice Signaling 6

CCITT
International Telephone and Telegraph Consultative Committee

CCS
Consumer Communications Service

CCS7
Common Channel Signaling System 7

ABB-1

CDRP
Call Detail Recording Platform

CIC
Carrier Identification Code

CIP
Calls In Progress

CLD
Customer Long Distance

CNI
Common Network Interface

COS
Class of Service

CSC
Circuit Selection Capability

CSR
Carrier Specific Routing

CTI
Call Treatment Indicator

D

DED
Dedicated Egress Data

DISC
Disconnect

DLN
Direct Link Node

DN
Dialed Number

DNT
Dialed Number Trigger

DP
Dial Pulse

DSA
Digital Switched Access

DSA
Direct Services ANI

DSD
Direct Services Dialing

DT
Digit Type

DTMF
Dual Tone Multifrequency

DWAN
Dedicated Wide Area Network

E

EAMF
Equal Access Multifrequency

EBAF
Extended Bellcore AMA Format

ECOS
End-to-End Class-of-Service

EO
End Office

ERPI
ECOS Routing Pattern Identity

F

FAI
Foreign Administration Identifier

FENCLASS
Far End Class

FENPA
Far End Numbering Plan Area

FEOFC
Far End Office

ABB-2

FG D
Feature Group D

FHC
Final Handling Code

FHT
Final Handling Treatment

FI
Feature Indicator

FISI
Feature Interaction Status Indicator

FSIT
Foreign Subscriber Identification
Telephone

FTA
File Transfer and Activation

G

GRI
Generic Routing Information

GSDN
Global Software Defined Network

GSS
GTN Support System

GTN
Global Transaction Network

GTT
Global Title Translation

I

I/O
Input/Output

I800
International 800

IAM
Initial Address Message

IBNS
International Billed Number Screening

ICDR
International Call Detail Record

ID
Identification

IDDD
International Direct Distance Dialing

IE
Information Element

II
Information Indicator

ILDS
International Long Distance Service

INUP
International ISUP

iPCC
Individual Per-Call Control

IRAS
Integrated Routing Assignment System

ISAIC
Improved Service Announcement and
Information Collection

ISC
International Switching Center

ISDN
Integrated Services Digital Network

ISUP
Integrated Services Digital Network
User Part

ITN
Integrated Test Network

IWZ1
International World Zone 1

L

LAC
Line Number Application for Customers

LD
Language Digit

LDS
Long Distance Service

LEC
Local Exchange Carrier

LIDB
Line Identification Data Base

LSA
Line Service Application

M

MRT
Multiple Routing Treatment

MRTT
Multiple Routing Treatment Table

MSP
Multisignal Processor

MTC
Maintenance

N

NAI
Network Access Interruption

NANP
North American Numbering Plan

NCD
Network Call Denial

NCP
Network Control Point

NEMOS
Network Management Operations
Support System

NESAC
National Electronic Switching
Assistance Center

NG-ODA
Next Generation-Office Data
Administration

NI
Network Interconnect

NMDS
Network Management Display System

NPA
Numbering Plan Area

NPAAG
Numbering Plan Area Announcement
Group

NPAG
Numbering Plan Area Announcement
Group

NRA
Network Remote Access

NRM
Network Recording Management

NSN
Network Switch Number

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NSS
Network Support System

NTM
Network Traffic Management

O

OAS
Originating AT&T Switch

OCC
Other Common Carrier

ODA
Office Data Administration

ODA
Office Data Assembler

ODAD
Office Data Assembler Datalinking

ODMS
Office Database Management System

OLI
Originating Line Information

OLP
Off-Line Processor

ONPA
Originating Numbering Plan Area

OSPS
Operator Services Position System

OSS
Operations Support System

P

PAS
Public Announcement System

PBAO
Protected, Disk-backed, API
accessible, and ODA populated
memory

PCC
Pseudo Country Code

PCP
Positive Call Processing

PECC
Product Engineering Control Center

PIC
Preferred Interexchange Carrier

PINET
Packet Internal Network

POTS
Plain Old Telephone Service

PRD
Product Release Document

PRI
Primary Rate Interface

PSBO
Protected, Simplex, Disk-backed Office
Data

PTT
Post Telephone and Telegraph

PZM
Predictive Zero Maintenance

Q

QDRS
Quantum Data and Routing System

R

RAO
Revenue Accounting Office

RC
Recent Change

RCAS
Recent Change Administration System

RDB
Routing Data Block

REL
Release

RPC
Regional Processing Center

RTNR
Real Time Network Routing

S

SADC
Special Access Data Channel

SAFER
Split Access Flexible Egress Routing

SAT
Satellite

SCCP
Signaling Connection Control Part

SCP
Service Control Point

SCS
Service Circuit System

SCU
Service Circuit Unit

SDDN
Software Defined Data Network

SDDN-I
Software Defined Data Network-
International

SDI
Switched Digital International

SDL-24
Synchronous Data Link No. 24

SDN
Software Defined Network

SDNA
Software Defined Network Access

SDS
Switched Digital Service

SGD
Station Group Designator

SI
Service Identity

SIAQ
Send Information Analyze Query

SII
Service Identity Index

SLPID
Service Logic Program Identifier

SMS
Service Management System

SNOWR
Service Now Routing

SPC
Signaling Point Code

ABB-6

SPGTT
Self-Provisioning Global Title
Translation

SREC
Secondary Records

SRI
Supplemental Routing Information

SS7
Signaling System 7

SSN
Subsystem Number

SSP
Service Switching Point

SSSAG
Service Support System
Announcement Group

SSSG
Service Support System
Announcement Group

SST
Signaling Service Type

T

TAN
Trunk Appearance Number

TAS
Terminating AT&T Switch

TC
Transport Capability

TCA
Test Control Area

TCAP
Transaction Capabilities Application
Part

TCC
Technical Control Center

TNR
Transmitted Noise Reduction

TNS
Transit Network Selection

TOP
Task Oriented Practice

TOPAS
Testing Operations Provisioning
Administration System

TSG
Trunk Subgroup

TUP
Telephone User Part

U

UBM
Unsuccessful Setup Backward
Information Message

UGT
Universal Global Translator

UNI
UNIdirectional

USEC
Universal Services Echo Canceler

USI
User Service Information

V

VAS
Via AT&T Switch

VCA
Vacant Code Announcement

VON
Virtual On-Net

VPN
Virtual Private Network

W

WZ1
World Zone 1

ABB-8