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Bell Labs Innovations



# **4ESS™ Switch** **Product Release Document**

## **4E21 Release 4 Generic**

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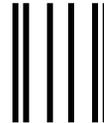
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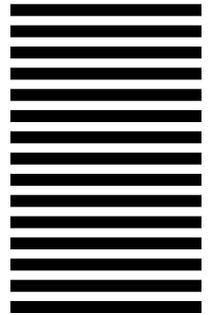
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## About This Document

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### 1. Purpose

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**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*<sup>™</sup> switch. A PRD is written to cover the features introduced in full generic releases and quarterly generic releases. This particular PRD provides information pertaining to the new features included in the 4E21 Release 4 Generic.

### 2. Scope

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**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 Lucent Technologies 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 4E21 Release 4 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

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**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**

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**4.01** The 4E21 Release 4 Generic contains 15 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: *3B20D 1.0 Gigabyte Disk Replacement Feature (457)*

The current 4ESS™ switch and 5ESS® KS-23908,L21 1.0 GB SCSI disk drive used in 3B20D and 3B21D systems Data User Parts (DUPs) and UN375C packs are being replaced with a new 2.0 GB disk unit. The new disk drive is a replacement only and no new additional capabilities are being provided with it.

Chapter 2: *AT&T 800 Services Account Codes Feature (4529)*

The AT&T 800 Services Account Codes Feature provides a tool to assist in tracking long distance usage so that 800 subscribers can identify and/or bill back to specific departments, locations, or customers. It also provides a way for 800 subscribers to reduce the number of unauthorized phone calls or incorrectly dialed 800 numbers.

Chapter 3: *Call Forwarding for SDN and 800 Service Customers Feature (4590)*

This feature provides the capability for the Software Defined Network (SDN) and 800 customers to update the destination numbers for their defined services.

Chapter 4: *Improve Nemos to 4ESS™ Switch Interface - Phase 2 Feature (4751a)*

This feature completes the integration of the Network Management Operations System (NEMOS) and the Regional Network Management System (RNMS) into a single system. Phase 1 of this feature was introduced in the 4E21 Release 2 Generic.

Chapter 5: *Implementation of Announcement Set B on SCS Feature (4769)*

This feature provides music for queuing for the 800 Queuing subscribers. Announcement Set B is used for the music announcements and the Please Hold on Announcement.

Chapter 6: *Inbound I-800 Carrier Specific Routing and Enhanced Call Origination Feature (4785)*

This feature provides proper routing and billing of Inbound International 800 (I-800) calls from multi-carrier countries, Mexico and the Caribbean. This feature also addresses the Numbering Plan Area (NPA) splits that affect the Caribbean.

Chapter 7: *4ESS™ Switch Call Detail Recording Platform Tracer Count Consistency Feature (4790)*

This feature ensures that peg counts from the 4ESS™ switch and the Call Detail Recording Platform (CDRP) are consistent with each other.

Chapter 8: *Automatic Speech Recognition Phase 2 on the Service Circuit System Feature (4801)*

This feature provides an enhanced hardware platform on which the Automatic Speech Recognition (ASR) on the Service Circuit System (SCS) is based. The new hardware consists of a separate Custom Data Service Cabinet (CDSC)-II containing the ASR equipment. The CDSC-II holds up to 4 Custom Data Service Units (CDSUs)-II.

The CDSU-II provides all the application features currently supported on the CDSU-I.

Chapter 9: *Automatic Number Identification Data Feature (5004)*

This feature provides Automatic Number Identification (ANI) or calling number information from the AT&T switch to Service VU, which allows for the processing and storage of this additional information. This feature extends the scope of Service VU by providing insight into call completion performance or traffic characterization based on originating Local Exchange Company (LEC) switches.

Chapter 10: *Short Term D-Channel Expansion Feature (5020)*

This feature increases the number of available D-Channel terminations in the 4ESS™ switch by replacing the shelves in the Small Scale Integration Ring Node Cabinets (SSIRNC) or High Density Ring Node Cabinets (HDRNC).

Chapter 11: *XTSI Alarm Reporting Enhancement Feature (5041)*

This feature generates an audible spurt minor alarm and prints an alarm message when a DS3 transmission alarm is detected.

Chapter 12: *XTSI in Input/Output Messages Feature (5111a)*

This feature changes the input and output messages relating to the Expanded Time Slot Interchange (XTSI). From a technician's

perspective, the XTSl is completely different from both the Digital Interface Frame (DIF) and the Time Slot Interchange (TSI), so input and output messages relating to the XTSl should refer to it as XTSl, not TSl.

Chapter 13: *Call Turn Around Feature (5247)*

The Call Turn Around (CTA) Feature allows Business Communications Services (BCS) customers to take advantage of AT&T rates on calls originating from non-US locations that compete in foreign countries and in the US.

Chapter 14: *Increased Buffer Size of SS7 Satellite Nodes using Basic Error Correction Feature (5376)*

This feature allows the use of Basic Error Correction with satellite links by providing a Number 2 Signal Transfer Point (2STP) tool that will accept the associated link parameters, and by increasing the buffer size.

Chapter 15: *800 Call Prompter, Interim Speech Recognition Capability for ISAIC Call Prompt Feature (5529)*

This feature provides speech recognition to the Social Security Administration 800 Service callers via the Network Services Complex (NSCX) frames until Automatic Speech Recognition (ASR) is available on Improved Service Announcement and Information Collection (ISAIC).

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

## **5. Product Safety Labels**

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**5.01** There are three types of safety labels used in Lucent Technologies 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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# 3B20D 1.0 Gigabyte Disk Replacement Feature (457)

# 1

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## **3B20D 1.0 Gigabyte Disk Replacement Feature (457)**

# **1**

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### **1. Feature Description**

**1.01** The current *4ESS*<sup>™</sup> switch and *5ESS*<sup>®</sup> KS-23908,L21 1.0 GB SCSI disk drive used in 3B20D and 3B21D systems Data User Parts (DUPs) and UN375C packs are being replaced with a new 2.0 GB disk unit. The new disk drive is a replacement only and no new additional capabilities are being provided with it. Therefore, the additional 1.0 GB of space provided by the new drive will not be utilized. The new replacement disk is Ks23908,L30 with a comcode of 407477413.

**1.02** A small software change is also provided so that the disk driver will recognize the new disk when it is installed.

#### **Benefits**

**1.03** The 1.0 GB disk drive has been manufacture discontinued. Therefore, the new 2.0 GB disk has been certified to replace the old disk.

### **2. Call Flow (Not Affected)**

### **3. Provisioning (Not Affected)**

## **4. Recording (Not Affected)**

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## **5. Network Management (Not Affected)**

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## **6. Maintenance/Troubleshooting**

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**6.01** When replacing a 640 MB SCSI disk (or smaller) with either a 1.0 GB SCSI disk or a 2.0 GB SCSI disk, the equipage field of the UCB for the MHD being replaced must be set to 0X10. Use the 3B RCV facility (RCV:MENU:RCVECD) to make this change. Initialization and verification of the newly installed disk will follow the current practices.

## **7. Transition Considerations**

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### **Software Dependency**

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**7.01** The new 2.0 GB disks can only be installed in switches that are running on the 4E21 Release 3 Generic or a later release.

### **Ubiquity**

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**7.02** It is not necessary for all 4ESS switches in the network to be running the 4E21 Release 4 Generic for this feature to be fully operational.

### **Turn On/Turn Off Mechanism**

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**7.03** The new 2.0 GB disk will be used for new ships and field replacements on an as-needed basis.

## **8. Input/Output Manual Pages (Not Affected)**

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# AT&T 800 Services Account Codes Feature (4529)

# 2

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# AT&T 800 Services Account Codes Feature (4529)

# 2

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## 1. Feature Description

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**1.01** The AT&T 800 Services Account Codes Feature provides a tool to assist in tracking long distance usage so that 800 subscribers can identify and/or bill back to specific departments, locations, or customers. It also provides a way for 800 subscribers to reduce the number of unauthorized phone calls or incorrectly dialed 800 numbers.

**1.02** This feature provides an 800 subscriber the following capabilities:

- Allows a caller to enter a set of digits as an account code, which can be used to route the call as well as segment the bill received by the subscriber. Call routing is provided via Customer Account Logic (CAL) and provisioned via the Global Transaction Network Support System (GSS). This feature enables customers to track long distance usage so that it can be identified and/or billed back to specific departments, locations, or customers. The subscriber can select either optional, mandatory or validated account codes.
- Enables subscribers to reduce the number of unauthorized phone calls or incorrectly dialed 800 numbers through account code validation. Previously, this capability was only provided as an adjunct based service and interaction with advanced features was not possible. The 800 Account Codes feature provides full feature interaction except for Automatic Speech Recognition (ASR). Speech recognition for the 800 Account Codes feature will be offered via another feature.

**1.03** Previously, Business Long Distance Services (BLDS) offered account codes as part of the Positive Call Processing (PCP) feature set but were not available for Inbound 800 Service. The AT&T 800 Services Account Codes Feature offers account

codes to Inbound 800 customers.

**1.04** In order to provide billing detail to the subscriber, this feature offers the following selections to the subscriber: optional, mandatory, or validated account codes (up to fourteen digits in length). These codes operate in the following way:

- **Optional** - The caller dials the 800 number. An announcement alerts the caller to enter the proper account code. The call completes after one of the following occurs:
  - After all digits (length ordered by the subscriber) are entered.
  - After a five second time-out.
  - After the caller enters a "#" within five seconds after the initial prompt.
  - After a three second interdigit timeout when an account code of an incorrect length is entered.
- **Mandatory** - The caller dials the 800 number. An announcement alerts the caller to enter the account code. The caller must enter the subscribed length of digits (extra digits ignored).
- **Validated** - The caller dials the 800 number. An announcement alerts the caller to enter the account code. The caller must enter digits as defined in the subscribed list (Pre-assigned values may either be the first part or the entire length of the account code.)

For each call placed, a prompt requesting the entry of an account code is played. For the mandatory and validated options, the caller is given a re-prompt in the event of an incorrect entry. Based on the subscribers specifications, the bill rendered is segmented according to the account code or digits entered.

**1.05** The GSS is the delivery support system used to administer the 800 Account Code data stored at the Number 2 Direct Services Dialed (2DSD) Network Control Point (NCP). Full deployment of 2DSD/NCP and 4ESS™ switch software is required before GSS provisions customers for this service.

## **2. Call Flow**

---

**2.01** The following call flow assumes that the caller dials the number 1-800-NXX-XXXX. Numbers such as 1-888-NXX-XXXX and 1-877-NXX-XXXX are handled in the same way as 1-800-NXX-XXXX calls.

### **A. Domestic 800 Call Flow**

**2.02** All services residing in the 2DSD/NCP are 10-digit routed and are single dipped within 48 hours of the commencement of entry of the subscriber's toll free number

into the GSS Provisioning System. For Domestic 800 Advanced Services and I800 Services, the following call flow applies:

- (1) The calling party dials a 1-800-NXX-XXXX and the LEC routes the call to the originating AT&T switch (OAS).
- (2) The OAS formulates a TCAP "Begin" message, then checks and finds a match between the received number and an entry in the Inbound Global Title Translation (GTT) Table. Routing information, from the Inbound GTT Table, is then inserted into the TCAP "Begin" message which allows it to be sent to the proper 2DSD/NCP.
- (3) The OAS sends the TCAP "Begin" message to the 2DSD/NCP.
  - Through the use of the modified TCAP Customized Announcement Capabilities parameter and the Announcement Set ID field in that parameter, the OAS specifies to the 2DSD/NCP whether it has the NSCX-Replacement (NSCX-R) SCU announcement set "S".
  - If the OAS does not have NSCX-R SCU capabilities, the TCAP Customized Announcement Capabilities parameter is not sent.
- (4) Upon receiving the TCAP Begin message, the 2DSD/NCP retrieves and executes the CAL associated with the call.
- (5) The 800 Account Codes calls require an announcement and/or additional information from the caller. The CAL provides the 2DSD/NCP with the announcement number to be played, the announcement set ID and the number and type of digits to be collected. The CAL returns to the 2DSD/NCP logic with Announcement Set "S" for 800 Account Codes customers.
- (6) The 2DSD/NCP logic compares the information received from the CAL to the OAS Capabilities received in the Begin message.
  - If the serving OAS has the required capabilities, the 2DSD/NCP sends a TCAP Continue or End message to the OAS containing the announcement set ID and the announcement ID indicated by the CAL. The number of digits to be collected, the end of digits character and the digit type are provided in the Digit Collection Indicators parameter.
  - If the OAS does not have the required capabilities, the 2DSD/NCP instructs the OAS to perform a service assist to a 4ESS switch that does have the required capabilities.
- (7) If the OAS receives a TCAP Continue message from the 2DSD/NCP, the following applies:
  - If the received TCAP message contains a Caller Interaction with a Customized Announcement parameter indicating Announcement Set "S", the OAS uses the NSCX-R SCU capabilities to play the right announcement to the caller. The NSCX-R SCU performs the necessary

actions.

- If a terminating announcement was requested, the OAS waits for the announcement to be completed before processing the next component in the message, then disconnects the call. Go to step (9).
- If an interactive announcement was requested, the NSCX-R SCU passes the information collected from the caller to the OAS. The OAS uses this information to formulate a TCAP Continue message with Component Type = Return Result and sends it to the 2DSD/NCP. The OAS may also send a TCAP Continue/End message containing a "Return Error" component if the OAS did not get the proper caller response. If the 2DSD/NCP receives the TCAP Continue message and determines, through call processing, that additional information is to be collected from the caller, go to step (5).

(8) If the OAS receives a TCAP End message from the 2DSD/NCP, it will contain:

- A Charging Bill Call Operation specifying that an AMA record should be made. This operation contains:
  - The A800 Billing Data Parameter with a Service Indicator (SIC) = 006 indicating the egress type.
  - The Generic Billing Data Parameter with a Call Code = 100 indicating an Inbound Domestic call processed in the 2DSD or a Call Code = 324 indicating an Inbound I800 call processed in the 2DSD.
  - The Digits (Destination Number) Parameter indicating the terminating routing number.
  - The Digits (ANI) Parameter if a handoff condition occurs.
  - The Digits (SAB Code) Parameter which indicates the Account Code entered by the caller.
- A connection Control Connect Operation with:
  - The Digits (Routing Number) parameter containing the destination number.
  - The Generic Routing Information Parameter containing the routing domain indicator.

(9) End of Call Flow

## **B. International 800 Call Flow**

**2.03** An Inbound I800 call flow for calls originating in Overseas/Mexico locations is

presented below:

- (1) An Inbound I800 call originates in an Overseas or Mexican location when the caller dials a toll free access code designated by the Telecommunication Administration (TA) in that country, followed by digits identifying the AT&T subscriber in the U.S.
- (2) The TA converts the dialed number to a Network Routing Number (NRN) of the form 196-WXY-CCVZ or 196-WXY-VCCZ, or Foreign Subscriber Identifying Telephone Number (FSIT) of the form 196-OOW-XYVZ, or an 800+7D number.
- (3) The TA's International Switching Center (ISC) forwards the 196/800 number to an AT&T ISC/Gateway using any available international trunk.
- (4) The AT&T ISC/Gateway functions as an OAS for these calls. The ISC determines which format of the 196 number it received and uses this information or the 800 number to perform 10-digit GTT.
- (5) Once the correct 2DSD/NCP is determined, the ISC queries the 2DSD/NCP with a TCAP Begin Message containing a Provide Instruction - Start operation. The 196/800 number is included in the Digits (Dialed Number) parameter. The Calling Line Identity (CLI), if available and 7 - 12 digits in length, is included in the Digits (ANI) parameter of the TCAP Begin message. If CLI is not available or is not 7 - 12 digits in length, the Digits (ANI) parameter is sent with a length of zero (0) in the Begin message. The Begin message is routed through a 2STP in the Common Channel Signaling (CCS) network to the appropriate 2DSD/NCP pair.

The 4ESS switch also sends the following information within the TCAP Begin Message:

- Through the use of the modified TCAP Customized announcement Capabilities parameter and the Announcement Set ID field in that parameter, the OAS specified to the 2DSD/NCP whether it has the NSCX-R SCU set announcement.
  - If the OAS does not have NSCX-R SCU capabilities, the TCAP Customized Announcement Capabilities parameter is not sent.
- (6) Go to step (4) of the Domestic 800 Call Flow.

### **3. Provisioning (Not Affected)**

### **4. Recording**

## AMA Code Structures and Modules

**4.01** There are no new or modified call codes or structure codes for this feature; however, two AMA Module 900's are outputted for 800 Account Code calls, as opposed to the previous single module. The originating 4ESS switch concatenates or joins together two AMA module 900s in order to allow for the populating of a maximum of 14 Sub-Account Billing (SAB) Code digits.

**4.02** The 4ESS switch populates a value of "1" (Subaccount Billing) in the Billing Code Indicator field (AMA Table 842) of each AMA Module 900. The following is the format for AMA Module 900 Billing Code (Table 4a) and the AMA tables in that module (Tables 4b,4c,and 4d):

**Table 2-A. Billing Code Module**

Information	Table Number	Number of Characters
Module Code Identification	88	4
Billing Code Indicator	842	2
Significant Digits in Next Field (s)	55	4
Subaccount Number	157	14

**Table 2-B. AMA Table 842 - Billing Code Indicator**

Binary Coded Decimal (BCD) Character	Description
1	0=(Not Used) 1 = Sub-Account Billing (SAB) Code 2 = Concentrated Calling Feature (CCF) Override Code 3 = Credit Card Authorization Code 4 = SAB Code not verified
2	SIGN (Hex C or D)

**Table 2-C. AMA Table 55 - Significant Digits in Next Field**

BCD	Value	Meaning
1-3	xxx	Number of Significant Digits in Next Field
4	Hex C or D	Sign

**Table 2-D. AMA Table 157 - Subaccount Number**

<b>BCD</b>	<b>Value</b>	<b>Meaning</b>
1-13	xxxxxxxxxxxx	Subaccount Number
14	Hex C or D	Sign

**4.03** The originating 4ESS switch must determine the number of digits received in the Digits (Sub-Account Billing Code) parameter within the Charging-Bill Call Operation in the TCAP End message from the 2DSD/2NCP, and record the number of digits (value) right-justified and padded with zeroes in the Significant Digits in Next Field (AMA Table 55).

## **5. Network Management (Not Affected)**

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## **6. Maintenance/Troubleshooting**

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**6.01** No new requirements. However, 800 Account Code failures are reported as Final Handling Code (FHC) 1617 until unique FHCs are provided.

## **7. Transition Considerations**

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### **Ubiquity**

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**7.01** It is necessary for all 4ESS switches in the network to be running the 4E21 Release 4 Generic for this feature to be fully operational.

### **Turn On/Turn Off Mechanism**

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**7.02** This feature is turned on with software deployment.

## **8. Input/Output Manual Pages (Not Affected)**

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## **Call Forwarding for SDN and 800 Service Customers Feature (4590)**

# **3**

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# Call Forwarding for SDN and 800 Service Customers Feature (4590)

# 3

---

## 1. Feature Description

- 1.01** This feature provides the capability for Software Defined Network (SDN) and 800 Services customers to update the destination numbers for their defined services.
- 1.02** SDN customers perform this function from on-net locations by using a special on-net number. If an SDN customer is off-net and wishes to update a destination number, an SDN Network Remote Access (NRA) 800 number can be used.
- 1.03** The development to support the SDN update function is done in the Customer Account Logic (CAL) and the No. 2 Dialed Services - ANI Based/Network Control Point (2DSA/NCP). No development is required in the switch for the SDN capability.
- 1.04** For 800 Services customers this feature uses "update NCP" and "customer NCP." The customer dials a special update 800 number. The NCP database performs the update in conjunction with the switch.

## 2. Call Flow

There are two possible call flow scenarios for this feature: The SDN On-Net Call Flow and the 800 Services Call Flow.

**2.01** The following steps (along with Figure 3-1) describe the call flow for the SDN On-Net Calls:

1. The SDN call arrives at the *4ESS*<sup>TM</sup>-2000 switch.
2. The *4ESS*-2000 switch uses Global Title Translation (GTT) to determine the appropriate 2NCP to query.
3. The *4ESS*-2000 switch sends a Transaction Capabilities Application Part (TCAP) begin message to the 2NCP. The Begin message includes the customer ID, Automatic Number Identification (ANI), dialed number, and node capabilities (Improved Service Announcement and Information Collection [ISAIC] availability) at the *4ESS*-2000 switch.
4. The 2NCP uses the ANI and Customer ID information to determine which customer account (i.e. destination number) is being accessed. The customer account contains the logic and data for the customer's features. CAL identifies the call as an update based on the dialed number.
5. Based on the customer logic, the 2NCP sends a TCAP Continue message back to the *4ESS*-2000 switch.
6. The Continue message instructs the *4ESS*-2000 switch to:
  - Play an announcement prompting for the caller's unique authorization code.
  - Collect the authorization code digits.
7. The *4ESS*-2000 switch sends a TCAP message to the 2NCP with the collected digits.
8. The CAL logic verifies the authorization code.

**If the code is... Then...**

Invalid	The code validation process is repeated. A maximum of three attempts is allowed before the call is terminated.
Valid	The 2NCP sends a TCAP continue message to the <i>4ESS</i> -2000 switch.

9. The Continue message instructs the *4ESS*-2000 switch to do the following:
  - Play an announcement giving the caller a choice of either checking the current destination, or updating with a new destination number.
  - Collect the digit indicating the caller's choice.

10. The 4ESS-2000 switch sends a TCAP Continue message to the 2NCP with the caller's choice. Based on the caller's choice, the 2NCP will instruct the 4ESS-2000 switch as follows:

**If the caller chooses...****Then...**

To check the current number

The 2NCP sends a TCAP Continue message instructing the 4ESS-2000 switch to play the number and provide the option of updating.

To enter a new destination

The 2NCP sends a TCAP Continue message instructing the 4ESS-2000 switch to prompt for the new destination number and collect the digits.

11. For the caller's update call forwarding destination choice, the 4ESS-2000 switch collects digits and sends them back to the 2NCP via a TCAP Continue message.
12. The 2NCP validates this number according to predefined restrictions.
13. If the caller enters an invalid number, it is played back before the caller is prompted for another entry. Three attempts at entering a valid destination are allowed. On the third failed attempt, a terminating announcement is played and the call is terminated.
14. When the caller enters a valid destination number, the 2NCP instructs the 4ESS-2000 switch to do the following:
- Play back the number.
  - Collect a digit indicating whether the updated destination number is correct or incorrect.
- | <b>If the number is...</b> | <b>Then...</b>  |
|----------------------------|---|
| Incorrect                  | Caller enters a new destination number. A maximum of three attempts is allowed before the call is terminated. |
| Correct                    | Proceed to the next step.   |
15. The updated destination number is stored in the customer record.
16. A terminating announcement is played and the call terminated.
17. The 2NCP updates its mate with the new destination number.

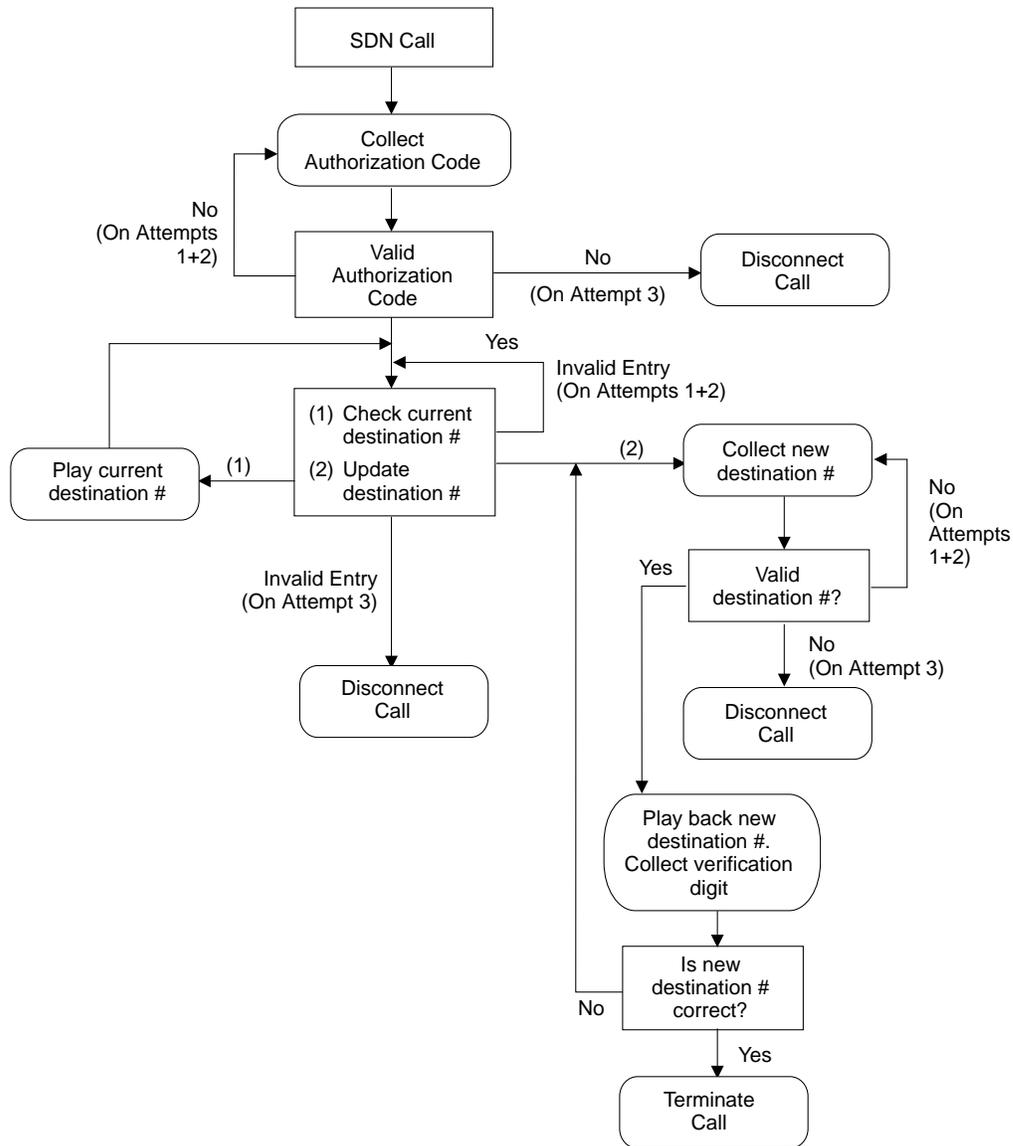


Figure 3-1. Software Defined Network On-Net Call Flow

**2.02** The following steps (along with Figure 3-2) describe the call flow for 800 services:

1. The subscriber dials a special 800 number reserved for destination number updates.
2. The call arrives at the *4ESS-2000* switch.
3. The *4ESS-2000* switch performs 10-digit GTT on the dialed 800 number.
4. The *4ESS-2000* switch routes the call to the update 2NCP which is designated to receive call forwarding update calls.
5. The update 2NCP sends a TCAP Continue message back to the *4ESS-2000* switch.
6. The Continue message instructs the *4ESS-2000* switch to:
  - Play an announcement prompting for the customer's 800 number.
  - Collect the digits of the 800 number.
7. The *4ESS-2000* switch sends a TCAP Continue message to the update 2NCP with the collected digits.
8. The CAL logic verifies whether the 800 number is valid.
9. If the 800 number is invalid, the switch again plays an announcement prompting for the customer's 800 number. Three attempts to enter a valid number are allowed. On the third failed attempt, a terminating announcement is played and the call is terminated.
10. If the 800 number is valid, that 800 number is returned to the *4ESS-2000* switch as the Routing Number in the TCAP End message. Also included in the End message is an indicator to identify this as an update call, rather than as a regular 800 call. (This indicator is the new TCAP parameter called the A800 Supplemental Information parameter.
11. The *4ESS-2000* switch drops the connection to the update 2NCP. The *4ESS-2000* switch re-enters 10-digit GTT using the subscriber's 800 number now stored as the Routing Number and initiates a new transaction to the appropriate customer 2NCP containing the customer record. (The *4ESS-2000* switch includes the subscriber's 800 number in the TCAP Begin message that is sent to this customer 2NCP.) Also included in the Begin message is the A800 Supplemental Information parameter.
12. The 2NCP uses the subscriber's 800 number to determine which customer account contains the logic and data for that customer feature. CAL identifies the call as an update call based on the presence of the TCAP A800 Supplemental Information parameter.
13. Based on the customer logic, the 2NCP sends a TCAP Continue message back to the *4ESS-2000* switch. The Continue message instructs the *4ESS-2000* switch to:

- Play an announcement prompting for the authorization code.
  - Collect the authorization code digits.
14. The 4ESS-2000 switch sends a TCAP message to the 2NCP with the collected digits.
15. The CAL logic verifies the authorization code.
- If the code is...    Then...**
- |         |  |
|---------|--|
| Invalid | The code validation process is repeated. A maximum of three attempts is allowed before the call is terminated. |
| Valid   | The 2NCP sends a continue message to the 4ESS-2000 switch.   |
16. The Continue message instructs the 4ESS-2000 switch to do the following:
- Play an announcement giving the caller a choice of either checking the current destination, or updating with a new destination number.
  - Collect the digit indicating the caller's choice.
17. The 4ESS-2000 switch sends a TCAP Continue message to the 2NCP with the caller's choice and based on the 2NCP customer logic.
- If the caller chooses...    Then...**
- |                                  |  |
|----------------------------------|--|
| To check the current number      | That number is played and the option of updating is offered again via the 4ESS-2000 switch.  |
| To update with a new destination | The 2NCP sends a TCAP Continue message instructing the 4ESS-2000 switch to prompt for the new destination number and collect the digits. |
18. For the update selection, the 4ESS-2000 switch collects digits and sends them back to the 2NCP via a TCAP Continue message.
19. The 2NCP validates this number according to predefined restrictions.
20. If the caller enters an invalid number, the number is played back before the caller is prompted for another entry. Three attempts at entering a valid destination are allowed. On the third failed attempt, a terminating announcement is played and the call is terminated.
21. When the caller enters a valid destination number, the 2NCP instructs the 4ESS-2000 switch to do the following:
- Play back the number
  - Collect a digit indicating whether the updated destination number is correct or incorrect.

**If the number is... Then...**

Incorrect

Caller enters a new destination number. A maximum of three attempts is allowed before the call is terminated.

Correct

Proceed to the next step.

22. The updated destination number is stored in the customer record.
23. A terminating announcement is played and the call terminated.
24. The 2NCP updates its mate with the new destination number.

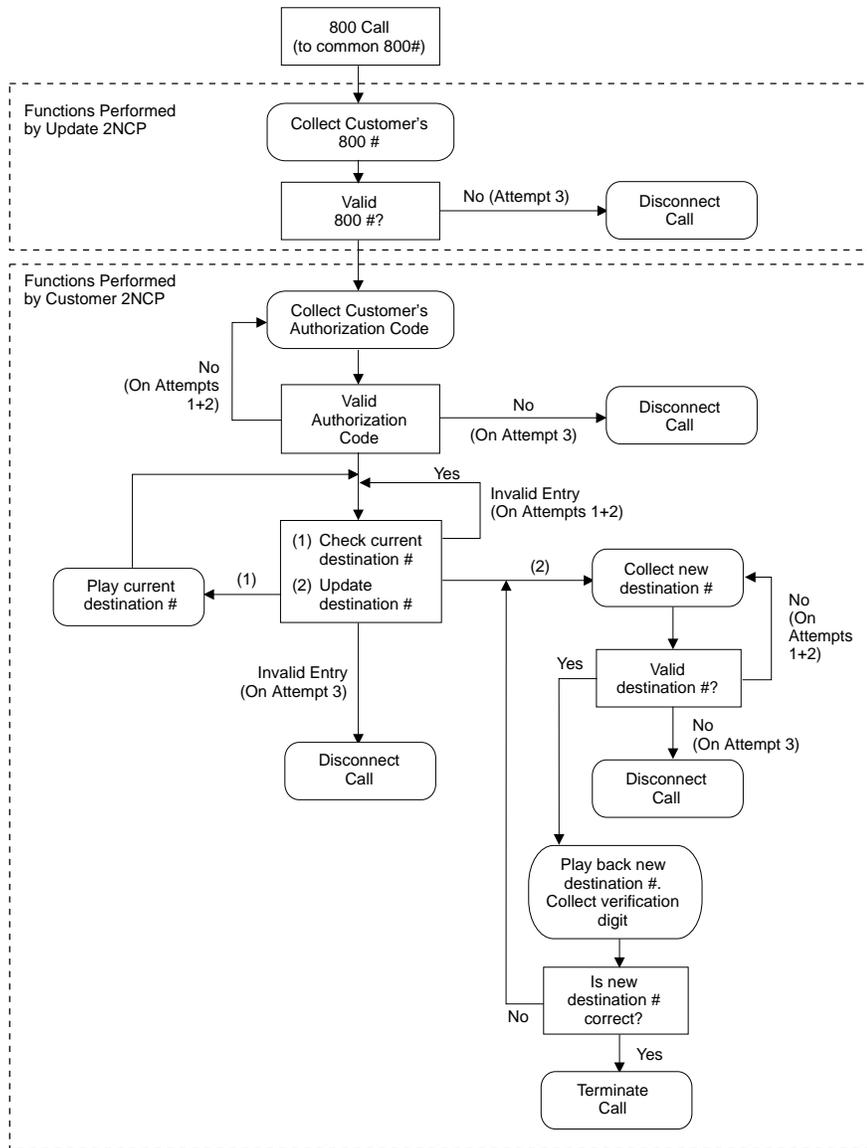


Figure 3-2. 800 Call Flow

### **3. Provisioning (Not Affected)**

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### **4. Recording**

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- 4.01** Structures 00903 through 00904 will contain the new module, 904 Call Forwarding Transactions.

### **5. Network Management (Not Affected)**

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### **6. Maintenance/Troubleshooting (Not Affected)**

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### **7. Transition Considerations**

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#### **Ubiquity**

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- 7.01** Before this feature is activated, all 4ESS-2000 switches in the AT&T Switched Network (ASN) must be running the 4E22 Release 1 Generic, and all associated 3B20D computers in the ASN must be running 4AP14 Release 4.

**⇒ NOTE:**

This feature should be deployed but not activated for 4E21R4.

#### **Turn On/Turn Off Mechanism**

---

- 7.02** This feature is turned on automatically in the 4ESS-2000 switch by software deployment. Activation/deactivation is controlled by the availability of the update 2NCP and provisioning of the special 800 number used for the destination updates.

### **8. Input/Output Manual Pages (Not Affected)**

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# Improve NEMOS to 4ESS™ Switch Interface—Phase 2 Feature (4751a)

# 4

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# **Improve NEMOS to 4ESS™ Switch Interface—Phase 2 Feature (4751a)**

# **4**

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## **1. Feature Description**

- 1.01** This feature completes the integration of the Network Management Operation System (NEMOS) and the Regional Network Management System (RNMS) into a single system. The first phase of the integration was completed in the 4E21 Release 2 Generic.
- 1.02** The new integrated system that has been created will perform all the network management functions previously performed by NEMOS and RNMS.

## **2. Call Flow (Not Affected)**

## **3. Provisioning (Not Affected)**

## **4. Recording (Not Affected)**

## **5. Network Management**

---

- 5.01** In Phase 2, two messages have been changed from demand data messages to 5-minute data messages and one new demand data message has been created.

### **Changed Messages**

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- 5.02** Demand data message 56, Service Circuit Status Data, has been changed to a 5-minute data message. The new message number is Message 12.
- 5.03** Demand data message 58, Service Degrading Data, has also been changed to a 5-minute data message. The new message number is Message 113.

### **New Message**

---

- 5.04** A new demand data message, Message 92, Proportional Routing Table Demand Request, was created. This new message allows NEMOS to retrieve the contents of a Proportional Routing Table (PRT).

## **6. Maintenance/Troubleshooting (Not Affected)**

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## **7. Transition Considerations**

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### **Ubiquity**

---

- 7.01** It is not necessary for all 4ESS™ switches in the network to be running the 4E21 Release 4 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)**

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# Implementation of Announcement Set B on SCS Feature (4769)

# 5

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# Implementation of Announcement Set B on SCS Feature (4769)

# 5

---

## 1. Feature Description

**1.01** This feature is offered for the 800 Queuing subscribers. Announcement Set B is used to provide music for queuing. The Set S is used for the Into-Queue Announcements and the Set B is used for the music announcements and the Please Hold on Announcement. A Non-Barge-In architecture is used to enhance the music. All the music is digital and a three minute song is parsed into 30 second intervals. The announcement sequence played is determined by the No. 2 Direct Services Dialing/No. 2 Network Control Point (2DSD/2NCP) customer record.

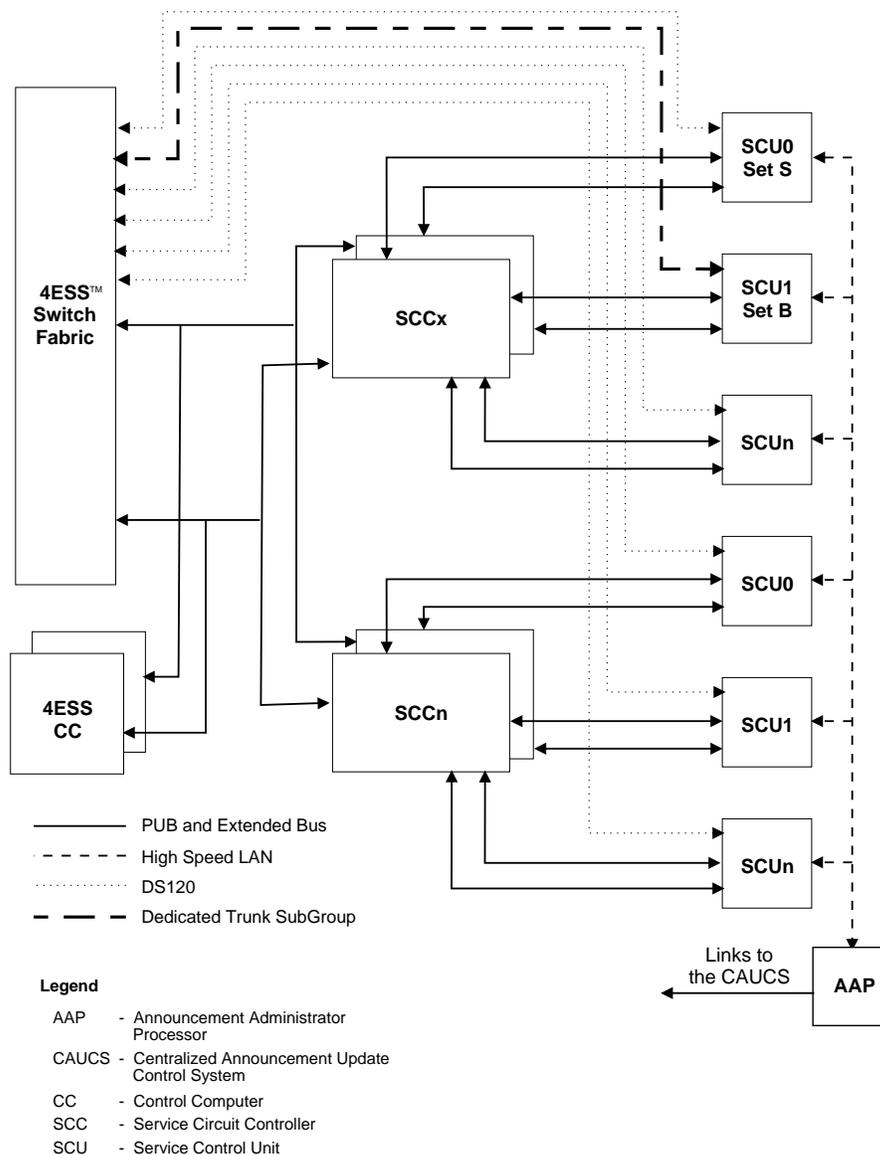
## 2. Call Flow

### Call Flow Description

- 2.01** Refer to Figure 5-1 for Set B Call Flow Diagram.
1. A client places a toll free call to a Queuing subscriber.
  2. The Originating AT&T Switch (OAS) recognizes the call, formulates a Transactions Capabilities Application Part (TCAP) "Begin" message and passes it to the 2DSD/2NCP. Through the use of the Customized Announcement Capability parameter, the OAS specifies to the 2DSD/2NCP all the announcement sets it has available. Through the Bit C in the Node Capability Parameter, the OAS specifies the availability of ports for playing announcements from Set B.

3. If the 2DSD/2NCP determines through the customer logic that the call requires additional information and if OAS has Set S capability, it sends the message to OAS to play call prompter announcements from Set S and collect digits. If OAS lacks Set S capability, 2DSD/2NCP instructs OAS to perform service assist.
4. If the call prompter announcements were requested, the 4ESS™ switch passes the information collected by Improved Service Announcement and Information Collection (ISAIC) Set S Service Circuit Unit (SCU) to 2DSD/2NCP.
5. The 2DSD/2NCP, through Customer Account Logic (CAL) call processing, processes the information and instructs the 4ESS switch to route the call, to final handle the call or to play an into-queue announcement from Set S.
6. If a circuit becomes available before the into-queue announcement is completed, the 2DSD/2NCP instructs the 4ESS switch to interrupt the announcement and route the call.
7. When the into-queue announcement is interrupted, the 4ESS switch notifies 2DSD/2NCP that the announcement has been interrupted. The call is then routed to the destination.
8. When the into-queue announcement is completed and still cannot be routed to the 2DSD/2NCP, based on music type, maximum time in queue, music announcement table ID, interval between Hold on announcement, Hold on announcement set (Set B), and Hold on announcement number, the 2DSD/2NCP passes to the 4ESS switch in a TCAP message, a string of up to 10 announcements (with Hold on announcement interleaved with music announcements).
9. If the 4ESS switch lacks the capability to play these announcements, the 2DSD/2NCP instructs the 4ESS switch to perform service assist.
10. If the maximum time in queue is not reached and if a circuit becomes available while announcements are being played from Set B, the 2DSD/2NCP instructs the 4ESS switch to interrupt the announcements.
11. The 4ESS switch interrupts the announcement and responds with a message indicating that the announcement has been interrupted. The call will then be routed to the destination.
12. If the maximum time in queue is not reached and the 4ESS switch is done playing the announcements, the 4ESS switch sends a TCAP message to 2DSD/2NCP asking for the next action.
13. In response to the TCAP message as in step 8, 2DSD/2NCP sends a string of up to 10 announcement numbers in a TCAP message to the 4ESS switch.
14. On completion of the maximum time in queue for the call, 2DSD/2NCP instructs the 4ESS switch to interrupt the music announcements, perform the Timeout Treatment (Ring, Busy, or play terminating announcement from Set S), and disconnect the call.

15. If the 4ESS switch lacks the capability for playing the terminating announcement, 2DSD/2NCP instructs the 4ESS switch to perform a Hand-off. The Hand-off switch performs the Timeout Treatment (Ring, Busy, or playing of a terminating announcement) and disconnects the call.



**Figure 5-1. Set B on SCS Architecture**

### **3. Provisioning**

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#### **Structures Affected**

---

**3.01** The following structures are affected by this feature:

- HT4SVCT
- HT4TBNCORE
- HT4CORETSG
- HT4CINLEN
- OD4RESRSETB

#### **A. HT4SVCT**

**3.02** For AT&T offices, one new Service Circuit Trunk Subgroup (TSG) is being defined for the Announcement Set B on the SCS feature, SVC\*SCNB\*\*\*. The following state value for the XL4SVCT is being defined:

State:	4XLSC_SETB
Entry:	28
Description:	Announcement Set B (music on hold)
TSG:	SVC*SCNB***

For non-AT&T offices, entry 28 must be zero.

#### **B. HT4TBNCORE**

**3.03** The new TSG SVC\*SCNB\*\*\* uses the same trunk block layout as the SVC\*SCNS\*\*\* TSG.

The population rules for set B are as follows:

1. The ASR Application is always 0 (stored in word 6).
2. The OSC is always NSCX.
3. The BTFN has a number and does not point to a HT4CINLEN entry.

#### **C. HT4CORETSG**

**3.04** Since 1008 circuits are being reserved for the SVC\*SCNB\*\*\* TSG (if it is an AT&T office), a CINLEN index is stored in this translator by NGODA for this TSG.

**D. HT4CINLEN**

**3.05** For the SVC\*SCNB\*\*\* TSG (if it is an AT&T office) built by NGODA, this translator must have the BTFN1 item equal to 0, the LEN1 item equal to 504, the BTFN2 item equal to 504, and the LENG2 item equal to 504.

**E. OD4RESRSETB**

**3.06** This is a new 1-word, 1-level structure in disk backed call store (PSBO) which holds the reservations Announcement Set B (music on hold without barge-in). Valid values are 0 to 30. This translator is populated by recent change form 810. The ODA/ODMS/NGODA will preserve this structure across retrofits.

The data entered is the number of circuits held in reserve to eliminate race conditions that may occur when notifying an NCP that Announcement Set B is available within the switch.

When this translator is provisioned with a value of 0, which is also the default value, it can cause problems with calls not completing properly when the threshold value of 0 is reached. The 4ESS switch would then erroneously notify the NCP that circuits are available when they may not be by the time the NCP responds. For this reason, translator OD4RESRSETB should be provisioned with a value that is non-zero.

Recent Change form 810 can be used to populate the desired value in the translator. A recommendation of 5 for the data value has been proposed.

The provisioning of translator OD4RESRSETB must be done before the feature is activated in the 4ESS switch.

**Recent Change (RC) Forms Affected**

---

**A. RC Form 200**

**3.07** Recent Change form 200 supports the new TSG name of SVC\*SCNB\*\*\*.

**3.08** When adding Announcement Set B SCS trunk to the SVC\*SCNB\*\*\* TSG, the XL4UTSVC of the SCU must be equal to 4XLUSETB.

**B. RC Form 703**

There are no changes to the layout of this form.

**3.09** If the value of the SVCT is 4 on the form, then ASRAPP and NCDSU must be blank and have their corresponding translation entries set to 0.

- 3.10** If the value of the SVCT is 4 on the form, then MAS FH AIN must be entered as N if the value in translations is 4XLUMAS\_AINY.
- 3.11** If the value of the SVCT is 4 on the form, then MAS FH AIN can be entered as blank or N if the value in translations is 4XLUMAS\_AINN.
- 3.12** If ASRAPP or NCDSU is entered as non-zero on the form, then the XL4UTSVCI (where i is 0 to 15 and corresponds to the SCU number input) in translations must not be set to 4XLUSETB(=4).

### C. RC Form 809

- 3.13** The ON/OFF flag will be populated from RC form 809. The Verify forms associated with the ON/OFF flag are 16az and 8j. Table 5-A gives the information needed to populate form 809 with the ON/OFF flags.

**Table 5-A. On/Off Flags For Announcement Set B on SCS**

809 Form Entry		Populates ITEM	With	Checks
FEATURE ITEM	ON/OFF			
PF33	ON	OD4PF33	4ODFB_ON	none
	OFF		4ODFB_OFF	none

### D. RC Form 810

The layout of this form is not changing, but additional population rules are being added.

- 3.14** A new entry of RESVSCNB is being added for **FEATURE INFO**.
- 3.15** When **FEATURE INFO** is RESVSCNB, then the valid range for **DATA** is 0 through 30.
- 3.16** When **FEATURE INFO** is RESVSCNB, the **DATA** is stored in OD4RESRSETB.

## 4. Recording (Not Affected)

## 5. Network Management (Not Affected)

## **6. Maintenance/Troubleshooting**

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### **Measurements**

---

**6.01** The 4ESS switch must maintain hourly counts per office to provide the number of times the 4ESS switch receives a 2DSD/2NCP request to play an announcement from Set B when Set B ports are not available. This count will be stored in the TDAS-MC file for access by DEMS/DARICS.

**6.02** The 4ESS switch shall collect the measurements for the Set B TSGs of SCS Service Circuits, specifically, these are the Seizure, Service Usage, Overflow, and Maintenance usage counts. These measurements will be reported in the existing MSC-0 Traffic and Plant Measurement Report.

These Service Circuit measurements must be included in the On-Site Operations Report (OSOR).

**⇒ NOTE:**

The OSOR tape is generated only for Release 1 of a generic; therefore, the counts will not appear on the OSOR report until the 4E22 Release 1 Generic.

### **Trunk Maintenance**

---

**6.03** The Set B capability will be used with a SCU within a SCS. A new TSG category must be developed and trunk maintenance software needs to be modified to interact with the new TSG.

## **7. Transition Considerations**

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### **Interaction With Other Features**

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- 7.01** The implementation of this feature is dependent on:
- Feature 4477 - 2NCP/CADCR Service Assist and Handoff
  - Feature 3172 - ISAIC Customized Announcement on the S-Set.

### **Deployment Order**

---

**7.02** The new customer logic to use Set B will be provisioned via Global System Status (GSS). GSS must be deployed last. The following order of deployment should be observed to provide a successful transition to Set B:

1. The Network Elements
2. The AAP and PC interface
3. The Operation Support Systems (OSSs)
4. Set B Trunk Provisioning
5. Loading the Music
6. Administrative provisioning of the Music Table
7. Enable Set B in the 4ESS switch
8. GSS.

## Ubiquity

---

- 7.03** It is not necessary for all 4ESS switches in the network to be running the 4E21 Release 4 Generic for this feature to be fully operational.

## Turn On/Turn Off Mechanism

---

- 7.04** This feature is turned on/off by RC/V form 809. Form 809 uses the on/off feature bit PF26.

- 7.05** This feature can also be turned on or off by an absolute word change. Item OD4PF33 in Office Data Assembler (ODA) structure OD4OFCCOPY2 is the office parameter that dictates whether or not Announcement Set B should be applied on the SCS.



**CAUTION:**

*The OD4OFCCOPY2 structure also contains the on/off bits for many other features. Be certain that the change you make affects only this feature.*

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

- Structure: OD4OFCCOPY2
- Core address of OD4PF33 in 4E21 Generic: 7143405
- Word: 5
- Size: 1
- Displacement of OD4PF33: 8
- On: 1
- Off: 0.

## **8. Input/Output Manual Pages (Not Affected)**

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# Inbound I-800 Carrier Specific Routing and Enhanced Call Origination Feature (4785)

# 6

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# Inbound I-800 Carrier Specific Routing and Enhanced Call Origination Feature (4785)

# 6

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## 1. Feature Description

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- 1.01** This feature provides proper routing and billing of Inbound International 800 (I-800) calls from multi-carrier countries, Mexico and the Caribbean. In addition, this feature also addresses the Numbering Plan Area (NPA) splits that affect the Caribbean.
- 1.02** Currently, Mexico, the Caribbean, and each carrier in a multi-carrier country are assigned distinct Pseudo Country Codes (PCC). When PCCs are replaced by International Direct Distance Dialing (IDDD) Country Codes (CC), it is necessary to have another index to distinguish these sub-regions.
- 1.03** An inbound I-800 call originates when the caller dials a toll-free number designated by the Post Telephone and Telegraph (PTT) in that country. To correctly route inbound I-800 calls from the Caribbean and Mexico, the AT&T Switch Network (ASN) must use appropriate End Office (EO) NXX values to identify the location of the call. Incoming calls from multi-carrier countries, other than Mexico and the Caribbean, will be given Carrier Specific Routing (CSR). CSR is a routing strategy using Multiple Carrier Treatment (MCT) tables to specify a listing of foreign carriers capable of completing the call. The ASN uses the appropriate NXX value to identify the originating sub-regions in Mexico and the Caribbean. In addition, Foreign Administration Identifier (FAI) values identify the corresponding carrier to ensure CSR. The availability of the NXX and FAI parameters ensures flexibility in routing, billing and blocking of calls originating from multi-carrier countries.

**1.04** The ASN recognizes the new NPA values created due to the split in the Caribbean portion of the International World Zone 1 (IWZ1). This allows the continued capability of screening and blocking of individual countries in the Caribbean and Mexican service areas after deployment of the new NPA.

**1.05** The ASN recognizes calls of Mexican origin by the Far-End Numbering Plan Area (FENPA) field content of +525 (which is the pseudo country code for Mexico) and converts the field to 052 before it continues the routing.

## **2. Call Flow (Not Affected)**

---

## **3. Provisioning**

---

### **Data Structures Affected**

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**3.01** A new indicator was defined in the HT43DIGTYP structure to recognize the valid three digit NPAs associated with the Caribbean portion of IWZ1. The DIGTYP field in this structure is populated with a DT7 value.

## **4. Recording**

---

**4.01** The Originating Numbering Plan Area (ONPA) field of the Automatic Message Accounting (AMA) records must be populated with the following:

- IWZ1 part of the Caribbean is populated with NPA-NXX-0000
- Mexico is populated with 052-NXX-0000.

## **5. Network Management (Not Affected)**

---

## **6. Maintenance/Troubleshooting (Not Affected)**

---

## **7. Transition Considerations**

---

### **Dependencies**

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- 7.01** This feature is dependent upon the installation of the following features:
- 3957, Inbound International 800 Service Separation of Country Code from Network Routing Number
  - 4170, Inbound International 800 Service Overseas Access
  - 4530, Routing and Billing for International 800 Service Calls from Mexico and the Caribbean.

### **Ubiquity**

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- 7.02** It is not necessary for all the 4ESS™ switches in the network to be running the 4E21 Release 4 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)**

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# **4ESS™ Switch Call Detail Recording Platform Tracer Count Consistency Feature (4790)**



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# **4ESS™ Switch Call Detail Recording Platform Tracer Count Consistency Feature (4790)**



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## **1. Feature Description**

- 1.01** This feature ensures that peg counts from the 4ESS™ switch and the Call Detail Recording Platform (CDRP) are consistent with each other.
- 1.02** Before this feature, when the 1B Processor transmitted a Service Count Tracer (SCT) event to the CDRP, the 1B would increment either the InterLATA Carrier (IC) or Operating Company (OC) miscellaneous count by 5. However, when the CDRP received the SCT event, it would increment its tracer count by only 3.
- 1.03** Prior to this feature, when the 1B Processor transmitted a Call Detail Recording (CDR) Data Tracer event to the CDRP, the 1B would increment the OC miscellaneous count by 1. When the CDRP received the CDR Data Tracer event, it would also increment its CDR Data Tracer record count by 1, even though it generated 6 records for this type of event.
- 1.04** This feature modifies the software in the 4ESS switch and the CDRP so the 1B Processor and CDRP counts for SCT and CDR Data Tracer events will match.

## **2. Call Flow (Not Affected)**

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### **3. Provisioning (Not Affected)**

---

### **4. Recording**

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**4.01** With this feature, when the 1B Processor transmits an SCT event to the CDRP, the 1B Processor increments either the IC or OC miscellaneous peg count by 1. The CDRP also increments its peg count by 1.

**4.02** When the 1B Processor transmits a CDR Data Tracer event to the CDRP, the 1B Processor increments the OC miscellaneous peg count by 6. The CDRP also increments its peg count by 6.

### **5. Network Management (Not Affected)**

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### **6. Maintenance/Troubleshooting (Not Affected)**

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### **7. Transition Considerations**

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#### **Dependencies**

---

**7.01** This feature is dependent upon the Call Detail Recording Platform being fully deployed prior to this feature being installed.

#### **Ubiquity**

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**7.02** It is not necessary for all 4ESS switches in the network to be running the 4E21 Release 4 Generic for this feature to be fully operational.

#### **Turn On/Turn Off Mechanism**

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**7.03** This feature is turned on automatically by software deployment.

## **8. Input/Output Manual Pages (Not Affected)**

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# Automatic Speech Recognition Phase 2 on the Service Circuit System Feature (4801)

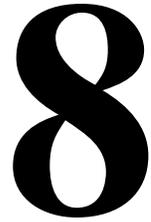
# 8

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# Automatic Speech Recognition Phase 2 on the Service Circuit System Feature (4801)



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## 1. Feature Description

**1.01** This feature provides an enhanced hardware platform on which the Automatic Speech Recognition (ASR) on the Service Circuit System (SCS) capability is based. The new hardware consists of a separate Custom Data Service Cabinet (CDSC)-II containing the ASR equipment. The CDSC-II holds up to four Custom Data Service Units (CDSUs)-II (each containing 60 ASR channels).

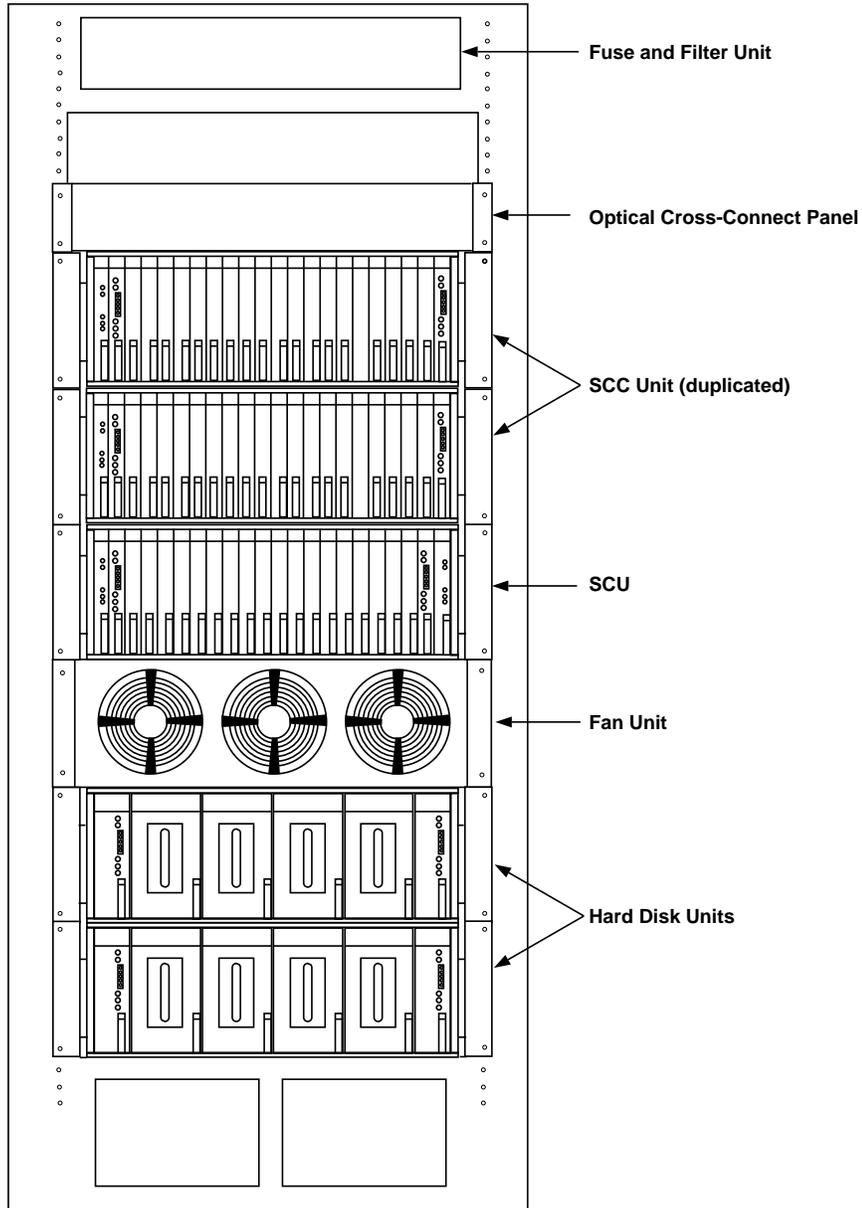
**1.02** The Service Circuit Controller (SCC) (illustrated in Figure 8-1) serves as an interface (translator) between the 4ESS™ switch and the SCU. Additionally, the SCC provides error detection and fault recovery capabilities for the SCU. The SCU plays the announcements, prompts the caller for the required digits, and collects the digits. The CDSU-II contained in the CDSC-II provides the speech recognition capability for the SCS.

**1.03** The CDSU-II provides all the application features currently supported on the CDSU-I.

## Physical Description

**1.04** The equipment cabinets used for each SCS are 6 feet high, 2 feet 6 inches wide, and 24 inches deep. The equipment cabinets are shielded with hinged double doors. Each cabinet contains *FASTECH*® circuit packs and backplanes. Most power units are mounted in the same unit in which they are used and are adjacent to the circuit

pack group served. Each circuit pack and power unit is labeled on designation strips to indicate its identity and boundaries. A 1-foot tall, 30-inch wide, and 24-inch deep cable cabinet is mounted on top of each cabinet.



**Figure 8-1. SCC Cabinet (J4024A-1)—Equipment Identification**

## Equipment Arrangements

---

**1.05** Each SCS consists of two or three cabinet types:

- The SCC cabinet (J4A024A-1)
- The SCU cabinet (J4A024B-1)
- The optional CDSC cabinet (J4A024C-1)
- The optional CDSC-II cabinet (J4A024D-1).

A 4ESS-2000 switch office can support up to eight SCS complexes. One CDSC (with up to 5 CDSU-IIs) can be engineered to each SCU with ASR capability, thereby providing a total of 120 ASR channels for the SCU.

### A. The SCC Cabinet (J4A024A-1)

**1.06** The SCC cabinet is the basic cabinet required in each SCS. It is equipped with each of the following units (Figure 8-1):

- One Fuse and Filter Panel (J5D003FJ-1)
- One Optical Cross-Connect Panel (J4A024AD-1)
- One SCC Unit consisting of member numbers 0 and 1 (J4A024AA-1)
- One SCU 0 (J4A024AB-1)
- One Fan Unit (J5D003FH-1)
- At least two Hard Disk Units (J4A024AC-1).

### B. The SCU Growth Cabinet (J4A024B-1)

**1.07** The SCUs in either the SCC cabinet or the SCU Growth Cabinet (Figure 8-2) can be assigned for ASR. The SCU for ASR has to be the Network Services Complex (NSCX) replacement SCU (contains the 4-GB disk TN-4000).

### C. Fuse and Filter Panel (J5D003FJ-1)

**1.08** The fuse and filter panel is arranged to accommodate the particular loads of the SCC cabinet. It has six input feeds from a Power Distribution Frame (PDF). These six input feeds supply the ten 4-position fuse blocks. Three alarm cards are provided, as well as one telephone jack card.

**1.09** Twelve possible inputs are at the rear of the fuse and filter panel. Each input can accept a feed from a PDF. An input (if used) consists of a capacitor, cables, connectors, other hardware, and at least one output fuse block at the front of the panel.

### D. Optical Cross-Connect Panel (J4A024AD-1)

1.10 The SCCs and SCUs are interconnected by an optical Extended Bus (EB). Both the SCCs and SCUs have EB circuit packs. The optical cross-connect panel, located in the SCC cabinet, connects the optical fibers of the SCC's EB circuit packs to the optical fibers of the SCU's EB circuit packs.

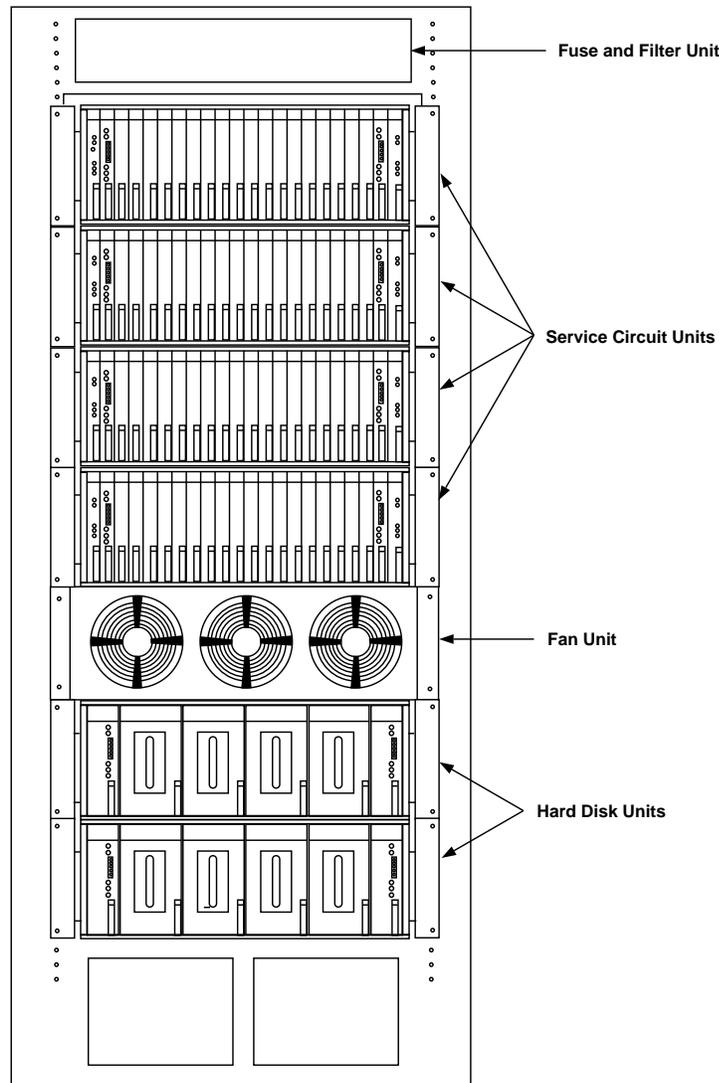


Figure 8-2. SCU Growth Cabinet (J4024B-1)—Equipment Identification

1.11 SCUs 0 through 7 are connected on row A. SCUs 8 through 15 are connected on row B. Each SCC has two connector appearances (one in row A and one in row B). This allows each SCC to access all SCUs in both rows A and B.

#### **E. SCC Unit 1 (J4A024AA-1)**

1.12 The SCC is a 2-shelf unit consisting of two identical (duplexed) controllers, each occupying a single shelf of the cabinet. The two controllers are stacked vertically with a common backplane.

1.13 The SCC has six circuit pack types:

- Peripheral Unit Bus Driver/Receiver (UN349)
- Peripheral Unit Bus Interface (UN350)
- Executive Processor (UN351)
- Global Random Access Memory (RAM) (UN352)
- Extended Bus Interface (KCN3)
- BTL Bus Terminator (UN357).

1.14 The SCC has three power controller types:

- Integrated Power Controller (TN1671)
- Power Control (TN1984)
- Power Converter (410AA).

#### **F. SCU 0 (J4A024AB-1)**

1.15 The SCU is a single unit with one shelf of circuit packs. For ASR, the SCU must be set up for NSCX replacement and therefore requires the 4-GB TN4000 disk. The SCU contains the following circuit pack types:

- DS-120 Exchange and Interface (TN1588)
- Multifaceted Signal Processor (TN1589)
- Enhanced Peripheral Interface Controller (TN1976)
- Microstore (TN1977)
- Small Computer System Interface (SCSI) Host Adaptor (TN1978)
- Voice Processor (TN1979)
- Voice Processor Interface Controller (TN1980)

- Buffer Control (TN1981)
- Buffer Fabric (TN1982)
- Table RAM (TN1983)
- Multifunctional Interface Processor (MIP) (TN4001)
- Extended Bus and Local Area Network (LAN) Interface (KCN4).

1.16 The SCU has two power controller types:

- Power Control (TN1984)
- Power Converter (410AA).

### **G. Fan Unit (J5D003FH-1)**

1.17 The bi-directional fan unit contains six fans (three located on the front of the unit and three located on the rear of the unit). The fan unit helps to cool the SCS cabinet.

### **H. Hard Disk Units (J4A024AC-1)**

1.18 The Hard Disk Unit (HDU) is comprised of two matched HD pairs and two power controllers. Each HDU takes up one shelf in the SCC cabinet. The SCC cabinet may be equipped with up to two HDUs (four matched pairs of hard disk circuit packs, all associated with SCU 0) for a total of two complete shelves. Each HDU uses up to four hard disk circuit packs (two pairs of hard disk circuit packs) and two UN356 disk power controller circuit packs. The hard disk circuit packs available are the TN1672 (420-MB), the TN1972 (2-GB), and the TN4000 (4-GB). The UN356 circuit pack supplies +12 volts and +5 volts to drive the hard disk circuit packs. The SCU assigned for the ASR function requires the TN4000 (4-GB) disks.

### **I. Custom Data Service Cabinet (J4A024C-1)**

1.19 The CDSUs provide ASR capabilities for the SCS. The CDSUs are located in a separate CDSC. A CDSC (illustrated in Figure 8-3) may contain as many as five CDSUs. One CDSC (with up to five CDSUs) is connected to each SCU with ASR capability. Each CDSU has a T1 Pulse Code Modulation (PCM) voice data interface to the MIP circuit pack. Two T1 circuits exist for each CDSU. The customer's reply and prompt are delivered to the CDSU on adjacent T1 time slots. The prompt data is required by the CDSU to perform local echo cancellation on the customer's line. This minimizes the effect echo has on the rate of speech of the CDSU. An ethernet LAN connection is provided between the SCU and the CDSU as a control link. The LAN is connected to one CDSU and then daisy-chained to each of the other CDSUs within the CDSC. Two TN4001 (MIP) circuit packs in an SCU terminate the T1 connections to the CDSUs.

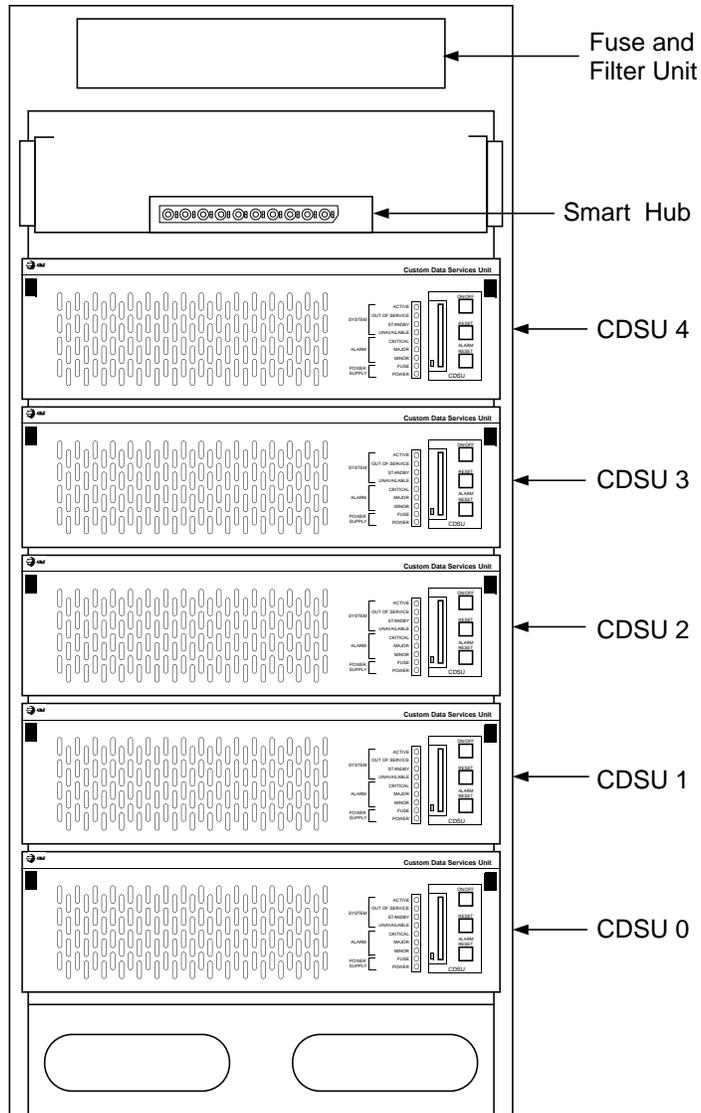


Figure 8-3. CDSC (J4A024C-1)

## **J. Custom Data Service Cabinet (J4A024D-1) Phase 2**

**1.20** The CDSU-IIs provide ASR capabilities for the SCS. The CDSU-IIs are located in a separate CDSC-II. A CDSC-II may contain as many as four CDSU-IIs. One CDSC-II (with up to four CDSU-IIs) is connected to two SCUs with ASR capability. Each CDSU-II is powered by the same bus as its associated SCU. Each CDSU-II has a T1 Pulse Code Modulation (PCM) voice data interface to the MIP circuit pack. Five T1 circuits exist for each CDSU-II. The customer's reply and prompt are delivered to the CDSU-II on adjacent T1 time slots. The prompt data is required by the CDSU-II to perform local echo cancellation on the customer's line. This minimizes the effect echo has on the speech rate of the CDSU-II. An ethernet LAN connection is provided between the SCU and the CDSU-IIs as a control link. The LAN is connected to one CDSU-II and then daisy-chained to the next CDSU-IIs within the CDSC-II. Two TN4001 (MIP) circuit packs in an SCU terminate the T1 connections to the CDSU-IIs.

**1.21** A keyboard and monitor are provided by the customer. Each CDSU-II is powered by the same power bus as its associated SCU.

## **K. Smart Hub**

**1.22** The Smart Hub provides Ethernet connection between the Announcement Administration Processor (AAP) and the CDSC CDSUs. The AAP (using a remote login capability) allows access to the CDSU error log files. AC power is required for the Hub equipment. Refer to AT&T 201-525-016AC, *4ESS™ Switching System Announcement Administration Processor—Maintenance, Diagnostics, and Trouble Clearing* for complete details.

## **2. Call Flow (Not Affected)**

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## **3. Provisioning**

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### **SCS Growth**

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**3.01** Detailed information to grow the SCS is contained in AT&T 234-153-060AC, *Service Circuit System (SCS) Growth—4ESS™ Switch*.

### **Recent Change Forms**

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**3.02** Table 8-A lists the Recent Change (RC) forms affected by this feature. Also included are the *4ESS™ Switch Translations Guide-4* (TG-4) references where the population rules may be found.

**Table 8-A. Recent Change Forms Affected**

Form No.	Use	TG-4	
		Div.	Sec.
200	Add service trunks to SCU.	7	2a
202	Delete service trunks from SCU.	7	2c
703	Add ASR Unit Type information to the SCU (equip the MIPs, CDSUs, and upper /lower indicator, CDSU hardware version).	7	7d
801	Stores the Grid, Lineup, Frame Number (GLF) data word that is used to format and print the Frame Location Number (FLN) for CDSCs.	7	8b

**3.03** The Frame Identification Code (FIC) identifies the physical location of equipment.

For ASR, however, the equivalent 4ESS-2000 switch FIC is an 8-character code referred to as the FLN. The FLN consists of the following elements:

Element	Character Position
Floor	1 and 2
Lineup	3 through 5
Period Only	6
Bay Number	7 and 8

**3.04** The SCU assigned for the ASR function must be of the NSCX replacement type (contains the large 4-GB TN4000 disk).

## **4. Recording (Not Affected)**

---

## **5. Network Management (Not Affected)**

---

## **6. Maintenance/Troubleshooting**

---

### **Diagnostic and Trouble Locating Procedure Requirements**

---

- 6.01** Since the CDSC is considered part of the SCU, SCS and Trouble Locating Procedure (TLP) software must deal with hardware failures. The SCS diagnostic program contains the appropriate phases to diagnose the ASR circuitry [SCU phase 16 (PH16) and phase 17 (PH17)]. PH16 diagnoses the MIP packs. PH17 diagnoses the MIP/CDSU-II interface and the CDSU-II equipment. The TLP for PH17 has also been enhanced to include the CDSC-II equipment plus the CDSC FLN. These diagnostics provide at least 95 percent pin fault detection.
- 6.02** The TLP for PH17 software reports circuit pack codes within the CDSC. The output contains a list of Field Replaceable Units (FRUs) with the equipment most likely to cause failures high on the list.
- 6.03** The AAP is also connected to the CDSU-IIs via the LAN (isolated by a LAN Hub). The AAP provides CDSU-II log file retrieval and CDSU program updates.
- 6.04** The SCU is connected to the CDSU-IIs via a LAN which is connected between MIP 0 and CDSU 0. CDSU 0 is then multiplexed to other equipped CDSUs, the last one terminating on a Hub LAN port.
- ⇒ NOTE:**  
The Smart Hub can support up to eight cabinets. For every ninth cabinet added, a new Smart Hub must also be added.
- 6.05** Refer to AT&T 201-525-016AC, *4ESS™ Switching System Announcement Administration Processor—Maintenance, Diagnostics, and Trouble Clearing* for complete details.

### **Fault Recovery**

---

- 6.06** The fault recovery software detects and reacts to ASR-induced errors and faults. If a CDSU-II-detected fault requires fault recovery action (for example, remove

and diagnose an SCU), the code triggers an SCU interject that initiates SCU removal and diagnostics. If diagnostics complete successfully, the SCU is restored to service. Faults not serious enough to require SCU removal cause a Base Level Maintenance (BLM) report to be printed. If a second Interject occurs within 15 minutes of diagnostic completion for the subject SCU, that SCU remains out of service until manual corrective action is taken.

**6.07** Table 8-B contains a list of the ASR miscellaneous error codes.

**Table 8-B. ASR Error Codes**

Octal/Hex	Description
140/0x60	General MIP error
141/0x61	MIP Transmit FIFO error
142/0x62	MIP Receive FIFO error
143/0x63	MIP Equipage error
144/0x64	CDSU Equipage error
145/0x65	General CDSU error
146/0x66	MIP Disk Job error
147/0x67	MIP Misc Data error
150/0x68	MIP Load Check Sum error
151/0x69	MIP or CDSU Reply Fail
160/0x70	ASR LAN MIP0 error
161/0x71	ASR LAN MIP1 error
162/0x72	ASR LAN CDSU0 error
163/0x73	ASR LAN CDSU1 error
164/0x74	ASR LAN CDSU2 error
165/0x75	ASR LAN CDSU3 error
166/0x76	ASR LAN CDSU4 error
170/0x78	ASR T1 MIP0 error
171/0x79	ASR T1 MIP1 error
172/0x7A	ASR T1 CDSU0 error
173/0x7B	ASR T1 CDSU1 error
174/0x7C	ASR T1 CDSU2 error
175/0x7D	ASR T1 CDSU3 error
176/0x7E	ASR T1 CDSU4 error

**6.08** Complete details on the Interject and BLM information are located in AT&T 234-151-077AC, *Service Circuit System (SCS) Maintenance—4ESS™ Switch*.

## **7. Transition Considerations**

---

### **Ubiquity**

---

- 7.01** It is not necessary for all 4ESS-2000 switches in the network to be running the 4E21 Release 4 Generic for this feature to be operational.

### **Turn On/Turn Off Mechanism**

---

- 7.02** Growth procedures are used to install and grow the ASR hardware. Recent Change forms are used during the growth process. Refer to AT&T 234-153-060AC, *Service Circuit System (SCS) Growth—4ESS™ Switch*.

## **8. Input/Output Manual Pages**

---

- 8.01** The following Input/Output Manual pages are affected by this feature:
- ANALY:TLPF-SUS—Lists the most likely faulty equipment locations. This output message identifies the unit and TLP file used to generate the list. The CDSC FLN is also output when the CDSC/CDSU FRUs are implicated by diagnostic test failures in SCU PH17. This manual page was part of the 20R3 PRD.

# Automatic Number Identification Data Feature (5004)

# 9

---

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# Automatic Number Identification Data Feature (5004)

# 9

---

## 1. Feature Description

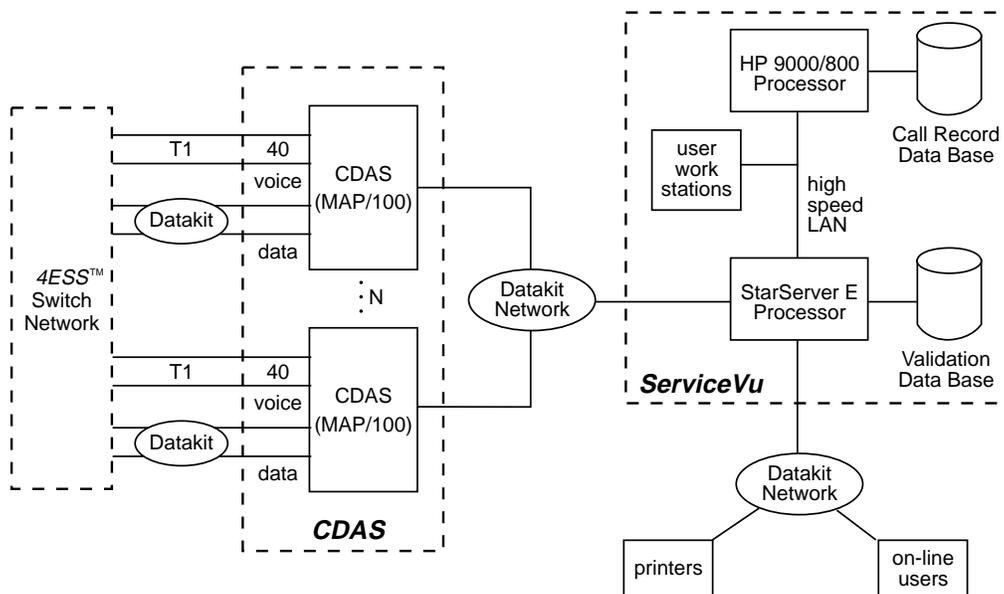
**1.01** The Automatic Number Identification (ANI) Data feature provides ANI or calling number information from the AT&T switch to Service Vu, and will allow for the processing and storage of this additional information. The components of this feature are the following:

- Collection of call record data on Call Data Acquisition System (CDAS) from the 4ESS™ switch which includes ANI or calling number
- Storage of ANI or Calling Number call data with each call record
- Addition of ANI or Calling Number to detail reports
- Addition of ANI or Calling Number definitions and logic to Natural Language applications
- Addition of an Operating Company Number (OCN) table which associates OCNs with company names
- Enhancement of the Common National Routing Database (CNRDB) data load to install OCNs and company names into the OCN table.

**1.02** This feature extends the scope of Service Vu by providing insight into call completion performance or traffic characterization based on originating Local Exchange Company (LEC) switches.

**1.03** The new data to be provided in this feature will be referred to as "calling number" for digits which represent the originating phone number, and/or "ANI" for digits which represent the billing number.

**1.04** Some background on this feature is that there is a Service Evaluation Interface in the 4ESS switch (which was originally known as the Service Observing Interface) that was developed to work with the No. 2 Service Evaluation System (SES). This same interface now interacts with the Call Data Acquisition System (CDAS) component of the Service Vu system. (See Figure 9-1.)



**Figure 9-1. CDAS Service Vu Architecture**

**1.05** As shown on the diagram, the voice interface between the 4ESS switch and CDAS is provided over a T1 connection. This feature will require no changes to this interface. The data interface between the 4ESS switch and CDAS is a 1200 baud asynchronous connection currently provided over Datakit. No hardware changes will be required to this interface. However, changes will be required to the format and content of the messages of the data interface.

**1.06** This current interface between the 4ESS switch and Service Vu provides call data which characterizes most aspects of the call. With this data it is possible to classify calls according to disposition, international or domestic destination, voice or data call type, SDN and 800 call type, etc... However, the calling number is not included in the call data. Without the calling data it is not possible to accurately determine the originating point of the call. Without this data, analyzing things such as characterization of independent telco to independent telco traffic carried over the AT&T network is not possible.

**1.07** This feature does not directly impact the *4ESS* switch since the calling number/ANI has always been collected and held in the *4ESS* switch registers. This feature impacts the CDAS and Service Vu systems by changing the expected data that they receive from the *4ESS* switch. The new data required by these systems is as follows:

- ANI/Calling Number Message Format — This is acquired through the addition of this data (when available) to the TRUNK ID message on the Service Evaluation data link between Service Vu and the *4ESS* switch.
- Numbering Plan Types — A Numbering Plan Type will be included in the TRUNK ID message whenever ANI or calling number digits are sent by the *4ESS* switch. This flag will not be sent if ANI or calling number data is unavailable.

**1.08** Following are a few items of interest that may help in understanding this feature:

- Local Exchange Company (LEC) CDAS machines will not support the addition of calling number or ANI data to the TRUNK ID message. Therefore, call observations on LEC *4ESS* switches must be handled differently.
- This feature can only be installed as an enhancement to Service Vu 1.0 in conjunction with CDAS 3.0.
- Call records already stored in CDAS will not be converted to the new format to accommodate calling numbers and ANI.
- CDAS will simultaneously support *4ESS* switches that have installed this feature and the *4ESS* switches that have not yet been upgraded to this feature.

## **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**

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### **Ubiquity**

---

- 7.01** It is not necessary for all 4ESS switches in the network to be running the 4E21 Release 4 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)**

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## Short Term D-Channel Expansion Feature (5020)

# 10

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## Short Term D-Channel Expansion Feature (5020)

# 10

---

### 1. Feature Description

- 1.01** In order to handle the forecasted D-Channel usage in the AT&T Network, additional D-Channel Nodes (DCNs) in the Common Network Interface (CNI) ring are needed.
- 1.02** This feature increases the number of available D-Channel terminations in the 4ESS™ switch by replacing the shelves in the Small Scale Integration Ring Node Cabinets (SSIRNC) or High Density Ring Node Cabinets (HDRNC). The shelves that previously housed Common Channel Signaling 7 (CCS7) and Special Access Data Control (SADC) are replaced with shelves that house DCNs.
- 1.03** Previously the two SSIRNCs had two shelves allocated for DCNs and the two HDRNC had three shelves allocated for DCNs. This expansion adds up to six DCNs (48 D-Channels) per switch, increasing the maximum to 280 D-Channels.
- 1.04** This feature requires no software development. The total number of Private Branch Exchange (PBX) defined nodes remains at 60 in the 4ESS switch. These nodes can be DCN, SADC, or iPCC nodes. There must be two iPCC nodes and the rest can be DCNs. By removing all SADC nodes we can have 58 DCNs. If the hardware supports more than 58 DCNs, we can give up the two DCNs in the HDRNC that support only one D-Channel and make use of DCNs in the new shelf in this feature, where they support eight DCNs per node.

## **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**

---

### **Hardware Dependencies**

---

- 7.01** The shelves housing nodes 7, 8, and 9 in groups 00 and 32 need to be degrown and new D-Ch shelves grown in.

### **Dependencies on Other Network Components**

---

- 7.02** All services using SADC nodes in node position 7, 8, and 9 of the SSIRNC cabinets must be discontinued before this feature is deployed.
- 7.03** All A-links using CCS7 nodes in node position 7, 8, and 9 of the SSIRNC cabinets must be degrown after A-High Speed links are deployed, or moved off to other nodes.

## **Ubiquity**

---

- 7.04** It is not necessary for all *4ESS* switches in the network to be running the 4E21 Release 4 generic for this feature to be fully operational.

## **Turn On/Turn Off Mechanism**

---

- 7.05** This feature is turned on automatically by software deployment.

## **8. Input/Output Manual Pages (Not Affected)**

---

## **XTSI Alarm Reporting Enhancement Feature (5041)**

# **11**

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## **XTSI Alarm Reporting Enhancement Feature (5041)**

# **11**

---

### **1. Feature Description**

- 1.01** This feature is an enhancement for Expanded Time Slot Interchange (XTSI) Feature 4754.
- 1.02** The original XTSI design did not print a message to the 1B maintenance channel or cause an audible alarm when a DS1 or DS3 transmission alarm was detected.
- 1.03** The XTSI Alarm Reporting Enhancement generates an audible spurt minor alarm and prints an alarm messages when a DS3 transmission alarm is detected. Most DS3 transmission alarms are due to faults within the office. The craft maintaining the switch needs to know when trunks go down due to any cause. This will help to expedite repairs. This feature does not issue an audible alarm for DS1 alarms.
- 1.04** This feature also prints a message when DS3 and DS1 transmission alarms are abated. No audible alarms occur for abatements.

### **2. Call Flow (Not Affected)**

### **3. Provisioning (Not Affected)**

## **4. Recording (Not Affected)**

---

## **5. Network Management (Not Affected)**

---

## **6. Maintenance/Troubleshooting**

---

### **Detection and Retirement of DS3 Alarms**

---

**6.01** The DS3 lines connecting the 4ESS™ switch to transmission equipment are expected to be mini T3s. Transmission alarms on these should be infrequent but of critical importance. An audible alarm will sound for each occurrence. Each of these transmission alarm activations and retirements are explicitly printed out as close to the time of detection as possible. When a DS3 alarm is retired, the Trunk Maintenance (TM) function will print a message to the 1B maintenance channel.

### **Detection and Retirement of DS1 Alarms**

---

**6.02** The DS1 paths extend across the entire network and are exposed to many perils. It is expected that bursts of massive DS1 alarms will occur. In order to deal with possible surges of DS1 alarms, they will be packaged into blocks of data printed every 5 minutes. These blocks contain both the onset and retiring of these alarms.

**6.03** At most, 64 alarm occurrences will be printed per 5 minute period. Overflow will be indicated in the printed message.

### **Inhibit and Allow DS1 and DS3 Alarms**

---

**6.04** The craft has the ability to inhibit or allow these reports, as well as the audible spurt minor alarm for DS3 alarms to occur. The default will print both DS1 and DS3 alarm messages. The craft also can output current inhibits in effect at various levels. Every 15 minutes a message is issued to the 1B maintenance channel if any inhibits are in effect.

## **7. Transition Considerations**

---

### **Dependencies**

---

- 7.01** While the introduction of the XTSI hardware is not tied to a specific software release for the 4ESS switch, the 4E21 Release 4 Generic is required to support this feature.

### **Ubiquity**

---

- 7.02** It is not necessary for all 4ESS switches in the network to be running the 4E21 Release 4 Generic for this feature to be fully operational.

### **Turn On/Turn Off Mechanism**

---

- 7.03** This feature is turned on and off by growth and degrowth of frames and associated trunks.

## **8. Input/Output Manual Pages**

---

- 8.01** Several new input/output messages were created for this feature. Table 11-A lists the affected messages, along with information about the time of release of each message, and whether the message is unchanged, new, modified, or reformatted.

**Table 11-A. Input and Output Messages Related to XTSI**

- (1) **TYPE** = Indicates Type of Message (TSI - XTSI Only - Both).
- (2) **GEN REL** = Indicates the 4E Generic Load the software went into (4E21R1, 21R2, 21R3).
- (3) **CHG** = Indicates if there was No-Change to Message, New Message, Modified Message.
- (4) **FORMAT CHG** = Indicates if there was a change to the Message format (wording of the message may have changed and that's OK. If the Output or Input has changed, that fact is indicated.)

I/O	Message	Type (TSI/XTSI)	GEN. REL.	NO CHG	NEW MSG	MOD. MSG	FORMAT CHG
IM	ALW:XALM	xtsi	21R4		X		
IM	INH:XALM	xtsi	21R4		X		
IM	OP:XALM	xtsi	21R4		X		
IM	STOP:REPT-XALM	xtsi	21R4		X		
OM	OP:XALM	xtsi	21R4		X		
OM	REPT:XALM-REPORT	xtsi	21R4		X		
OM	REPT:XALM	xtsi	21R4		X		
OM	REPT:XTSI	xtsi	21R4		X		

MESSAGE ID .....	ALW:XALM
WORK CENTER .....	MOC
GENERIC .....	4E21 Rel. 4 and later
CLASS .....	TOC MESSAGE
APPLICATION .....	4E
TYPE .....	Input

## 1. PURPOSE

The purpose of this message set is to allow the printing to the 1B Maintenance Channel of any Digital Signal Level 3 (**DS3**) and/or Digital Signal Level 1 (**DS1**) Facility Alarms or Alarm Abatements occurring on Expanded Time Slot Interchanges (**XTSIs**).

Format [1] is used to allow the printing to the Maintenance channel of all **XTSI DS1** and **DS3** Facility Alarms or alarm abatements.

Format [2] is used to allow the printing to the Maintenance channel of all **XTSI DS1** facility alarms or alarm abatements.

Format [3] is used to allow the printing to the Maintenance channel of all **XTSI DS3** facility alarms or alarm abatements.

Format [4] is used to allow the printing to the Maintenance channel of all **DS3** facility alarms or alarm abatements for the input **XTSI**.

Format [5] is used to allow the printing to the Maintenance channel of all **DS1** facility alarms or alarm abatements for the input **XTSI**.

Format [6] is used to allow the printing to the Maintenance channel of all **DS3** facility alarms or alarm abatements for the input **XTSI** and Digital Signal Level 3 Interface Unit (**D3U**).

Format [7] is used to allow the printing to the Maintenance channel of all **DS1** facility alarms or alarm abatements for the input **XTSI** and **D3U**.

## 2. FORMAT

[1]ALW:XALM!

[2]ALW:XALM;DS1!

[3]ALW:XALM;DS3!

[2]ALW:XALM;DS3:XTSI a!

[3]ALW:XALM;DS1:XTSI a!

[6]ALW:XALM;DS3:XTSI *a*,D3U *b*!

[7]ALW:XALM;DS1:XTSI *a*,D3U *b*!

**3. EXPLANATION OF MESSAGE**

*a*                   XTSI member number.

*b*                   D3U unit number (0-3).

**4. SYSTEM RESPONSE**

?D                   Data field contains an error. Illegal or invalid data input.

OK                   Good. Request accepted.

**5. REFERENCES**

PIDENT

TMTCXTMM

TMTCXTSI

Input Messages

*INH:XALM*

*OP:XALM*

Output Messages

*REPT:XALM*

*REPT:XTSI*

MESSAGE ID .....	INH:XALM
WORK CENTER .....	MOC
GENERIC .....	4E21 Rel. 4 and later
CLASS .....	TOC MESSAGE
APPLICATION .....	4E
TYPE .....	Input

## 1. PURPOSE

The purpose of this message set is to inhibit the printing to the 1B Maintenance Channel of any Digital Signal Level 3 (**DS3**) and/or Digital Signal Level 1 (**DS1**) Facility Alarms or Alarm Abatements occurring on Expanded Time Slot Interchanges (**XTSIs**).

Format [1] is used to inhibit the printing to the Maintenance channel of all **XTSI DS1** and **DS3** Facility Alarms or alarm abatements.

Format [2] is used to inhibit the printing to the Maintenance channel of all **XTSI DS1** facility alarms or alarm abatements.

Format [3] is used to inhibit the printing to the Maintenance channel of all **XTSI DS3** facility alarms or alarm abatements.

Format [4] is used to inhibit the printing to the Maintenance channel of all **DS3** facility alarms or alarm abatements for the input **XTSI**.

Format [5] is used to inhibit the printing to the Maintenance channel of all **DS1** facility alarms or alarm abatements for the input **XTSI**.

Format [6] is used to inhibit the printing to the Maintenance channel of all **DS3** facility alarms or alarm abatements for the input **XTSI** and Digital Signal Level 3 Interface Unit (**D3U**).

Format [7] is used to inhibit the printing to the Maintenance channel of all **DS1** facility alarms or alarm abatements for the input **XTSI** and **D3U**.

## 2. FORMAT

[1]INH:XALM!

[2]INH:XALM;DS1!

[3]INH:XALM;DS3!

[2]INH:XALM;DS3:XTSI a!

[3]INH:XALM;DS1:XTSI a!

[6]INH:XALM;DS3:XTSI *a*,D3U *b*!

[7]INH:XALM;DS1:XTSI *a*,D3U *b*!

**3. EXPLANATION OF MESSAGE**

*a*                   XTSI member number.

*b*                   D3U unit number (0-3).

**4. SYSTEM RESPONSE**

?D                   Data field contains an error. Illegal or invalid data input.

OK                   Good. Request accepted.

**5. REFERENCES**

PIDENT

TMTCXTMM

TMTCXTSI

Input Messages

ALW:XALM

OP:XALM

Output Messages

REPT:XALM

REPT:XTSI

MESSAGE ID .....	OP:XALM
WORK CENTER .....	MOC
GENERIC .....	4E21 Rel. 4 and later
CLASS .....	TOC MESSAGE
APPLICATION .....	4E
TYPE .....	Input

## 1. PURPOSE

The purpose of this message is to determine the types of Expanded Time Slot Interchange (**XTSI**) Facility Alarm or Alarm abatement printing to the maintenance channel which have been inhibited.

Format [1] is used to obtain the office inhibit status; the per **XTSI** inhibit status; the per Digital Signal Level 3 Interface Unit (**D3U**) inhibit status; this request will only output data for those **XTSIs** that are inhibited.

Format [2] is used to obtain the office inhibit status; the per input **XTSI** inhibit status.

Format [3] is used to obtain the office inhibit status; and the per inputs **XTSI**, **D3U** inhibit status.

## 2. FORMAT

[1]OP:XALM!

[2]OP:XALM:XTSI *a*!

[3]OP:XALM:XTSI *a*,D3U *b*!

## 3. EXPLANATION OF MESSAGE

*a*                    **XTSI** member number.

*b*                    **D3U** unit number (0-3).

## 4. SYSTEM RESPONSE

?D                    Data field contains an error. Illegal or invalid data input.

PF                    Printout Follows.

## 5. REFERENCES

PIDENT  
TMTCXMM  
TMTCXTSI

Input Messages  
ALW:XALM

*INH:XALM*

Output Message  
*OP:XALM*

MESSAGE ID .....	STOP:REPT-XALM
WORK CENTER .....	MOC
GENERIC .....	4E21 Rel. 4 and later
CLASS .....	TOC MESSAGE
APPLICATION .....	4E
TYPE .....	Input

#### 1. PURPOSE

To terminate the printing of the current *REPT:XALM* segmented message at the maintenance channel.

#### 2. FORMAT

**STOP:REPT;XALM!**

#### 3. EXPLANATION OF MESSAGE See Purpose.

#### 4. SYSTEM RESPONSE

OK                      Good. Processing in progress.

#### 5. REFERENCES

PIDENT  
TMTCX TMM  
TMTCX TSI

Output Message  
*REPT:XALM*

MESSAGE ID ..... OP:XALM  
 WORK CENTER ..... TOC  
 GENERIC ..... 4E21 Rel. 4 and later  
 APPLICATION ..... 4E  
 TYPE ..... Output

**1. FORMAT**

[1]OP:XALM  
 OFFICE INHIBIT STATUS:  
 DS3 a DS1 b

XTSI X/D3U/DS3 X/D3U/DS1  
 543210 543210  
 c d eeeee f ggggg  
 . . . . .  
 . . . . .  
 . . . . .

[2]OP:XALM  
 OFFICE INHIBIT STATUS  
 DS3 a DS1 b

XTSI D3U X/D3U/DS3 X/D3U/DS1  
 c h d i f j

**2. REASON FOR OUTPUT**

In response to the *OP:XALM* input command.

**3. VARIABLE FIELD DEFINITIONS**

- a Total office Digital Signal Level 3 (*DS3*) inhibit status:
  - 0— Printing of Expanded Time Slot Interchange (*XTSI*) facility alarm/alarm abatements at the *DS3* level is allowed for the office.
  - 1— Printing of *XTSI* facility alarm/alarm abatements at the *DS3* level is not allowed for the office.
  
- b Total office Digital Signal Level 1 (*DS1*) inhibit status:
  - 0— Printing of *XTSI* facility alarm/alarm abatements at the *DS1* level is allowed for the office.
  - 1— Printing of *XTSI* facility alarm/alarm abatements at the *DS1* level is not allowed for the office.

- c* *XTSI* member number.
- d* Individual *XTSI DS3* inhibit status:
- 0— Printing of *XTSI* facility alarm/alarm abatements at the *DS3* level is allowed for this *XTSI*.
  - 1— Printing of *XTSI* facility alarm/alarm abatements at the *DS3* level is not allowed for this *XTSI*.
- e* Each bit represents the Digital Signal Level 3 Interface Unit (*D3U*). number noted. For example: the first bit represents *D3U 5* and the last bit represents *D3U 0*:
- 0— Printing of *XTSI* facility alarm/alarm abatements at the *DS3* level is allowed for this *XTSI, D3U*.
  - 1— Printing of *XTSI* facility alarm/alarm abatements at the *DS3* level is not allowed for this *XTSI, D3U*.
- f* Individual *XTSI DS1* inhibit status:
- 0— Printing of *XTSI* facility alarm/alarm abatements at the *DS1* level is allowed for this *XTSI*.
  - 1— Printing of *XTSI* facility alarm/alarm abatements at the *DS1* level is not allowed for this *XTSI*.
- g* Each bit represents the *D3U* number noted. For example: the first bit represents *D3U 5* and the last bit represents *D3U 0*:
- 0— Printing of *XTSI* facility alarm/alarm abatements at the *DS1* level is allowed for this *XTSI, D3U*.
  - 1— Printing of *XTSI* facility alarm/alarm abatements at the *DS1* level is not allowed for this *XTSI, D3U*.
- h* *D3U* unit number (0-5).
- i* Individual *XTSI D3U DS3* inhibit status:
- 0— Printing of *XTSI* facility alarm/alarm abatements at the *DS3* level is allowed for this *XTSI, D3U*.
  - 1— Printing of *XTSI* facility alarm/alarm abatements at the *DS3* level is not allowed for this *XTSI, D3U*.
- j* Individual *XTSI D3U DS1* inhibit status:
- 0— Printing of *XTSI* facility alarm/alarm abatements at the *DS1* level is allowed for this *XTSI, D3U*.

- 1— Printing of *XTSI* facility alarm/alarm abatements at the *DS1* level is not allowed for this *XTSI*, *D3U*.

**4. ACTION TO BE TAKEN**

None. Informational only.

**5. REFERENCES**

PIDENT  
TMTCXMM  
TMTCXTSI

Input Messages

*ALW:XALM*  
*INH:XALM*  
*OP:XALM*

MESSAGE ID .....	REPT:XALM
WORK CENTER .....	TOC
GENERIC .....	4E21 Rel. 4 and later
APPLICATION .....	4E
TYPE .....	Output

### 1. FORMAT

*REPT:XALM* [OVERFLOW OF a;] b; c

XTSI D3U DS1 EVENT

d e f g  
 . . . .  
 . . . .  
 . . . .

### 2. REASON FOR OUTPUT

This message will be printed to the 1B Maintenance Channel after any Expanded Time Slot Interchange (*XTSI*) Digital Signal Level 1 (*DS1*) has experienced a Facility/Transmission Alarm or Alarm Abatement at the *DS1* Level and has not been inhibited via a Teletypewriter (TTY) command.. Only the highest level alarm will be printed (RED|YELLOW|BLUE).

Up to twenty alarms/abatements will be printed per segment of this message. The maximum number of segments which can be printed per 5 minute interval is 4.

### 3. VARIABLE FIELD DEFINITIONS

*OVERFLOW* More than 64 requests received in a 5 minute period. Only 64 will be queued.

*a* Number of *DS1* occurrences which exceeded the maximum printing buffer size.

*b* Segment status:

*COMPLETED*—

Last message segment.

*IP*—

Intermediate message segments.

*MANUALLYSTOPPED*—

Terminated due to a TTY input.  
(*STOP:REPT;XALM* command.)

*STARTED*— Indicates the first segment.

*TERMINATED*—

Aborted. Either printing not completed before beginning of next print interval or machine in overload.

- c* Message segment number (1-13).
- d* *XTSI* member number.
- e* Digital Signal Level 3 Interface Unit (*D3U*) unit number (0-5).
- f* *DS1* number (1-28).
- g* Event:
  - ASA*— Alarm Indication Signal (AIS) *DS1* alarm (BLUE).
  - ASC*— AIS *DS1* alarm abatement (BLUE).
  - LAC*— Local *DS1* alarm abatement (RED).
  - LCA*— Local *DS1* alarm (RED).
  - RAC*— Remote *DS1* alarm abatement (YELLOW).
  - RMA*— Remote *DS1* alarm (YELLOW).

**4. ACTION TO BE TAKEN**

Facilitate the retirement of any alarms as reported.

**5. REFERENCES**

PIDENT

TMTCXTMM

TMTCXTSI

Input Messages

*ALW:XALM*

*INH:XALM*

*OP:DGSTAT*

*OP:XALM*

*STOP:REPT-XALM*

Output Messages

*OP:DGSTAT*

*OP:XALM*

MESSAGE ID .....	REPT:XALM-REPORT
WORK CENTER .....	TOC
GENERIC .....	4E21 Rel. 4 and later
APPLICATION .....	4E
TYPE .....	Output

**1. FORMAT**

*REPT:XALM REPORTING INHIBITED*

**2. REASON FOR OUTPUT**

This message is printed to the 1B Maintenance once per 15 minute period, if any Expanded Time Slot Interchange (*XTSI*) Facility Alarm message printing has been inhibited via the *INH:XALM* input command. This message is not alarmed.

**3. VARIABLE FIELD DEFINITIONS**

See Purpose.

**4. ACTION TO BE TAKEN**

Request the *OP:XALM* command.

**5. REFERENCES**

PIDENT  
TMTCXSTM  
TMTCXTSI

Input Messages  
*ALW:XALM*  
*INH:XALM*  
*OP:XALM*

MESSAGE ID .....	REPT:XTSI
WORK CENTER .....	TOC
GENERIC .....	4E21 Rel. 4 and later
APPLICATION .....	4E
TYPE .....	Output

### 1. FORMAT

*REPT:XTSI a,D3U b; DS3 c*

### 2. REASON FOR OUTPUT

This message will be printed to the 1B Maintenance Channel whenever any Expanded Time Slot Interchange (*XTSI*) Digital Signal Level 3 Interface Unit (*D3U*) is experiencing a Facility/Transmission Alarm or Alarm Abatement at the *D3U* Level and the printing has not been inhibited via a Teletypewriter (TTY) command. When an alarm condition is reported, a spurt minor alarm will accompany the message.

### 3. VARIABLE FIELD DEFINITIONS

*a*                    *XTSI* member number.

*b*                    *D3U* unit number (0-5).

*c*                    Event:

*A3A*— Alarm Indication Signal (AIS) Digital Signal Level 3 (DS3) alarm (BLUE).

*A3C*— AIS DS1 alarm abatement (BLUE).

*L3A*— Local DS1 alarm (RED).

*L3C*— Local DS1 alarm abatement (RED).

*R3A*— Remote DS1 alarm (YELLOW).

*R3C*— Remote DS1 alarm abatement (YELLOW).

### 4. ACTION TO BE TAKEN

Facilitate the retirement of any alarms as reported.

### 5. REFERENCES

PIDENT  
TMTCX TMM  
TMTCX TSI

Input Messages  
*ALW:XALM*  
*INH:XALM*

*OP:DGSTAT*  
*OP:XALM*

Output Messages

*OP:DGSTAT*  
*OP:XALM*

## **XTSI in Input/Output Messages Feature (5111a)**

# 12

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## **XTSI in Input/Output Messages Feature (5111a)**

# 12

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### **1. Feature Description**

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- 1.01** This feature changes the input and output messages relating to the Expanded Time Slot Interchange (XTSI). From a technician's perspective, the XTSI is completely different from both the Digital Interface Frame (DIF) and the Time Slot Interchange (TSI), so input and output messages relating to the XTSI should refer to it as XTSI, not TSI.
- 1.02** This is the first of three features (5111a, 5111b, 5111c). Due to the large number of messages that need to be added or changed for TSI/XTSI, the changes are being done in three phases. These features eliminate any confusion between the TSI/XTSI input/output messages, warnings, and alarms.
- 1.03** Input messages provided by the *4ESS*<sup>TM</sup> switch for manual control of the XTSI accept only the keyword "XTSI".
- 1.04** Output messages provided by the *4ESS* switch in response to input messages relating to manual control on the XTSI use the keyword "XTSI". The output messages provided by the switch for autonomous conditions relating to the XTSI use the keyword "XTSI".
- 1.05** This feature eliminates any potential confusion between TSI/XTSI input/output (I/O) messages, warnings, and alarms.

## **2. Call Flow (Not Affected)**

---

## **3. Provisioning (Not Affected)**

---

## **4. Recording (Not Affected)**

---

## **5. Network Management (Not Affected)**

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## **6. Maintenance/Troubleshooting (Not Affected)**

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## **7. Transition Considerations**

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### **Dependencies**

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- 7.01** While the introduction of the XTSI hardware is not tied to a specific software release for the 4ESS switch, the 4E21 Release 4 Generic is required to support this feature.

### **Ubiquity**

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- 7.02** It is not necessary for all 4ESS switches in the network to be running the 4E21 Release 4 Generic for this feature to be fully operational.

### **Turn On/Turn Off Mechanism**

---

- 7.03** This feature is turned on and off by software installed in 4E21 Release 3 and 4 Generic.

## **8. Input/Output Manual Pages**

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- 8.01** Many messages are affected by the XTSI feature. Table 12-A lists the affected messages, along with information about the time of release of each message; and whether the message is deleted, new, or modified.

**Table 12-A. Input and Output Messages Related to XTSI**

- (1) **TYPE** = Indicates Type of Message (TSI - XTSI Only - Both).
- (2) **GEN REL** = Indicates the 4E Generic Load the software went into (4E21R2, 21R3, 21R4).
- (3) **CHG** = Indicates if there was a Message Deleted, New Message, Modified Message.
- (4) **FORMAT CHG** = Indicates if there was a change to the Message format (wording of the message may have changed and that's OK. If the Output or Input has changed, that fact is indicated.)

I/O	Message	Type (TSI/XTSI)	GEN. REL.	DEL	NEW MSG	MOD. MSG	FORMAT CHG
IM	ALW:TSI	tsi	21R4			X	
IM	ALW:XTSI	xtsi	21R4		X		
IM	ANALY:TSI	tsi	21R4			X	
IM	ANALY:XTSI	xtsi	21R4		X		
IM	CLR:TSIBP:TSI	tsi	21R4			X	
IM	COPY:TSI	tsi	21R4	X			
IM	COPY:TSIFILE:TSI	tsi	21R4			X	
IM	COPY:XTSI	xtsi	21R4			X	
IM	DGN:TSI	tsi	21R4			X	
IM	DGN:XTSI	xtsi	21R4		X		
IM	DUMP:TSI-D3U	both	21R4	X			
IM	DUMP:TSI-IREG	both	21R4	X			
IM	DUMP:TSIFILE	tsi	21R4			X	
IM	DUMP:TSIMEM:TSI	tsi	21R4			X	
IM	DUMP:XTSI-CREG	xtsi	21R4		X		
IM	DUMP:XTSI-D3U	xtsi	21R4		X		
IM	DUMP:XTSI-IREG	xtsi	21R4		X		
IM	EX:TSI	tsi	21R4			X	
IM	EX:XTSI	xtsi	21R4		X		
IM	INH:TSI	tsi	21R4			X	
IM	INH:XTSI	xtsi	21R4		X		
IM	INIT:DGSTAT	xtsi	21R4			X	
IM	LOAD:TSI-CREG	both	21R4			X	
IM	LOAD:TSI:D3U	xtsi	21R4	X			
IM	LOAD:TSI:IREG	both	21R4	X			

I/O	Message	Type (TSI/XTSI)	GEN. REL.	DEL	NEW MSG	MOD. MSG	FORMAT CHG
IM	LOAD:TSIFILE	tsi	21R4			X	
IM	LOAD:TSIMEM	xtsi	21R4			X	
IM	LOAD:XTSI-D3U	xtsi	21R4		X		
IM	LOAD:XTSI-IREG	xtsi	21R4		X		
IM	OP:DGSTAT	both	21R4			X	
IM	OP:TSIBP	tsi	21R4			X	
IM	RMV:TSI	tsi	21R4			X	
IM	RMV:XTSI	xtsi	21R4		X		
IM	RST:TSI	tsi	21R4			X	
IM	RST:XTSI	xtsi	21R4		X		
IM	SET:DIGROUP,TSI,D3U	xtsi,unique	21R4			X	
IM	SET:NETROUT	both	21R4			X	
IM	SET:TSIBP	tsi	21R4			X	
IM	STOP:ANALY-TSI	tsi	21R4			X	
IM	STOP:ANALY-XTSI	xtsi	21R4		X		
IM	SW:TSI	both	21R4	X			
IM	SW:XTSI	xtsi	21R4		X		
IM	UPD:TSI	both	21R4	X			
IM	UPD:XTSI	xtsi	21R4		X		
IM	VER:TRKNAME	both	21R4		X		
OM	AUD:PUSTAT	both	21R4			X	
OM	CLR:TSIBP:TSI	xtsi	21R4			X	
OM	COPY:TSI	xtsi	21R4	X			
OM	COPY:TSIFILE	tsi	21R4			X	
OM	COPY:XTSI	xtsi	21R4		X		
OM	DGN:TSI-PUB	both	21R4			X	
OM	DGN:TSI-TERM	tsi	21R4			X	
OM	DGN:TSI-TEST	tsi	21R4			X	
OM	DGN:XTSI-ILL	xtsi	21R4		X		
OM	DGN:XTSI-NOT	xtsi	21R4		X		
OM	DGN:XTSI-PUB	xtsi	21R4		X		
OM	DGN:XTSI-TERM	xtsi	21R4		X		
OM	DGN:XTSI-TEST	xtsi	21R4		X		
OM	DUMP:TSI-D3U	xtsi	21R4	X			
OM	DUMP:TSI:IREG	xtsi	21R4	X			

I/O	Message	Type (TSI/XTSI)	GEN. REL.	DEL	NEW MSG	MOD. MSG	FORMAT CHG
OM	DUMP:TSIFILE	tsi	21R4			X	
OM	DUMP:XTSI-CREG	xtsi	21R4		X		
OM	DUMP:XTSI-D3U	xtsi	21R4		X		
OM	DUMP:XTSI-IREG	xtsi	21R4		X		
OM	DUMP:TSIMEM	tsi	21R4			X	
OM	EX:TSI-ADDR	tsi	21R4			X	
OM	EX:TSI-ILL	tsi	21R4			X	
OM	EX:TSI-LOOP	tsi	21R4			X	
OM	EX:TSI-NOT	tsi	21R4			X	
OM	EX:TSI-PUB	tsi	21R4			X	
OM	EX:TSI-SUSP	tsi	21R4			X	
OM	EX:TSI-TERM	tsi	21R4			X	
OM	EX:TSI-TEST	tsi	21R4			X	
OM	EX:XTSI-ADDR	xtsi	21R4		X		
OM	EX:XTSI-ILL	xtsi	21R4		X		
OM	EX:XTSI-LOOP	xtsi	21R4		X		
OM	EX:XTSI-NOT	xtsi	21R4		X		
OM	EX:XTSI-PUB	xtsi	21R4		X		
OM	EX:XTSI-SUSP	xtsi	21R4		X		
OM	EX:XTSI-TERM	xtsi	21R4		X		
OM	EX:XTSI-TEST	xtsi	21R4		X		
OM	INIT:DGSTAT	both	21R4			X	
OM	LOAD:TSI-CREG	both	21R4			X	
OM	LOAD:TSI-D3U	xtsi	21R4	X			
OM	LOAD:TSI-IREG	both	21R4	X			
OM	LOAD:TSIFILE	tsi	21R4			X	
OM	LOAD:TSIMEM	tsi	21R4			X	
OM	LOAD:XTSI-D3U	xtsi	21R4		X		
OM	LOAD:XTSI-IREG	xtsi	21R4		X		
OM	OP:DGSTAT	xtsi	21R4			X	
OM	OP:PERIFINH	both	21R4			X	
OM	OP:TSIBP:TSI	xtsi	21R4			X	
OM	REPT:FAN-FUSEALRM	xtsi	21R4			X	

I/O	Message	Type (TSI/XTSI)	GEN. REL.	DEL	NEW MSG	MOD. MSG	FORMAT CHG
OM	REPT:SDU:TSI	both	21R4			X	
OM	REPT:TSIBP	xtsi	21R4			X	
OM	RMV:TSI	tsi	21R4			X	
OM	RMV:XTSI	xtsi	21R4		X		
OM	RPT:TSI:D3U	xtsi	21R4	X			
OM	RPT:XTSI:D3U	xtsi	21R4		X		
OM	RST:TSI	tsi	21R4			X	
OM	RST:XTSI	xtsi	21R4		X		
OM	SET:DIGROUP	both	21R4			X	
OM	SET:TSIBP:TSI	xtsi	21R4			X	
OM	SW:TSI	tsi	21R4			X	
OM	SW:XTSI	xtsi	21R4		X		
OM	UPD:TSI	xtsi	21R4	X			
OM	UPD:XTSI	xtsi	21R4		X		
OM	VER:TRKNAME	both	21R4			X	
OM	REPT:FAN-AIR-FLOW	both	21R4			X	
OM	REPT:FAN-FUSEALRM	both	21R4			X	
OM	REPT:FUSE-ALARM	both	21R4		X		

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## Call Turn Around Feature (5247)

# 13

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## Call Turn Around Feature (5247)

# 13

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### **1. Feature Description**

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**1.01** The Call Turn Around (CTA) feature allows Business Communications Services (BCS) customers to take advantage of AT&T rates on calls originating from non-US locations that compete in foreign countries and in the United States.

**1.02** The caller in the originating country dials a Direct Inward Dialing (DID) number that provides access to the Network Adjunct Platform (NAP). The customer (caller) then hangs up the call after the first ring. The NAP looks up the customer record associated with the DID number and makes a call back to the customer to prompt for authorization code and destination number. After the authorization code is validated, the caller is connected to the destination location.

### **2. Call Flow**

---

**2.01** Three types of signaling are supported for CTA that enable customers to signal to the AT&T platform that they wish to place a call. At least one of these types is supported in each country where CTA access is offered. These three types follow:

- Code-Call Signaling
- Free Phone Access
- Callback Number and Customized Announcement Update.

## Code Call Signaling

---

**2.02** The following call flow is for Code Call Signaling:

1. The caller in Country A (Originating Country) dials a US Plain Old Telephone Service (POTS) number in the following format:

International Access Code + 1 + NPA + NXX XXXX

2. The Originating Carrier routes the call to the US using proportionate return routing. When the call arrives in the US, it is routed to the NAP in the US via the Local Exchange Carrier (LEC) over DID facilities. After the caller hears one or two rings, the caller hangs up. The caller is not billed for this call, since it is not answered.
3. Based on the DID number dialed by the caller, the NAP detects the call and 2 seconds after the call disconnects, generates an International Long Distance (ILD) call to a pre-provisioned callback number over a Small Scale Adjunct (SSA) type trunk connected to a 4ESS™ switch. The routing number is either an International Number of the following format:

011 + CC + NN

or a domestic and World Zone 1 number of the following format:

1 + NPA + NXX XXXX.

4. The 4ESS switch routes the call through an International Switching Center (ISC) or gateway switch. An International Call Detailed Record (ICDR) is generated at the ISC or gateway for this call to be used for settlement purposes. The 4ESS switch does not generate an Automatic Message Accounting (AMA) record for this call.
5. If the callback number answers:
  - a. If the callback number has the customized announcement option, do the following:
    - (1) The NAP plays a customized announcement associated with the caller's number (for example, "Please connect me to extension 1234").
    - (2) If the NAP detects any Dual Tone Multifrequency (DTMF) signaling within the next 5 seconds, the call flow continues immediately.
    - (3) If the NAP has already played the customized announcement three times, the call is disconnected and the call flow ends. Otherwise, the call flow returns to Step (1) above.

- b. All prompts and announcements used in the call flow from this point on use standard announcements in a language selected by the customer for his callback number when the number was provisioned. The NAP prompts the caller for an authorization code.
  - c. The NAP collects and validates the caller-entered digits (10-digit authorization code + 4-digit PIN). A "#" key may also be entered by the caller to indicate end of string.
  - d. If the Authorization Code provided by the caller is invalid, the caller is re-prompted for an authorization code. If the response received for the second prompt is invalid, an announcement is played and the call is disconnected. The call flow ends.
  - e. If the authorization code is valid, the NAP stores the authorization code for subsequent calls and prompts the caller for the destination number.
  - f. If the caller does not dial the destination number or dials an invalid destination number, the NAP plays an announcement to the caller to re-enter the destination number. The NAP maintains a customer-specific list of invalid domestic and international numbers that the customer does not want callers to be able to call (for example, 900 numbers). Seven-digit domestic numbers are not considered valid. If a valid destination number is not received in response to the second prompt, an announcement is played, the call is disconnected and a billing record is created with the destination number populated with zeros. The call flow ends.
  - g. The caller provides the destination number using the US-dialing plan (1 + 10-digit NPA NXX XXXX for US (and World Zone 1) locations) or 011 + CC + NN for non-US (and non-World Zone 1) destinations. A "#" key may also be entered by the caller to indicate end of string.
  - h. Any Code Calling signaling for the same callback number must be ignored during this phase of the callback process. Only one call at a time can be active per callback number.
6. If the call is not answered or is not completed, either through detection of call progress signals or time out, the NAP will re-attempt the call as in Step 3. A total of four call attempts will be made, after which the NAP will abandon the CTA attempt. If the NAP receives a DID code-calling signal for the same callback number while these four attempts are in progress, the NAP continues the call attempts until four attempts have been tried since the most recent DID code signal.
  7. The NAP receives the destination number and places an outbound call to the destination:
    - a. If the destination number is an international number or a POTS-type number, the call is routed over the SSA-type trunk directly connected to the 4ESS switch.

- b. If the destination number is a domestic number with a service-specific NPA code (for example, 800, 888), the call is to be routed to a LEC. If the NPA code is 500, 700, or 900 then it should be blocked.
8. The 4ESS switch routes the call to the destination. The caller hears all network call progress tones and announcements as the call is being established. If the destination is outside the United States, an ICDR record is generated at the ISC or gateway for this call, and will be used for settlement purposes. The 4ESS switch does not generate an AMA record for this call.
9. If the call is not answered or is not completed, either through detection of call progress signals or time out, the NAP will disconnect the destination number and record the unanswered call. The call flow continues at Step 13.
10. If an answer is detected, call duration timing begins and the NAP now monitors the caller for a "\*288" entry to detect a caller's attempt to place a sequence call or a "##" entry to indicate call completion:
  - a. If a "\*288" entry is received, the NAP disconnects the destination number and records a billing record for the call. The call flow continues at Step 13.
  - b. If a "##" entry is received, the NAP disconnects both outbound calls and records a billing record for the call. The call flow ends.
11. If the NAP detects that the called party has disconnected, the NAP will create a billing record for the call. The call flow continues at Step 13.
12. If the NAP detects that the caller has disconnected, it disconnects the destination number and creates a billing number for the call. The call flow ends.
13. If the caller subscribes to Sequence Calling and the user has made less than ten call attempts, the NAP will prompt the caller for another destination number. The call flow continues at Step 5(E). Note that up to 9 sequence calls will be permitted during a given call and each sequence call results in a separate NAP billing record.
14. End of call flow.

## **Free Phone Access**

---

**2.03** The following is the call flow for Free Phone Access:

1. The caller dials a Freephone number provided by their local Public Telephone and Telegraph (PTT).
2. The PTT converts the dialed number to a 1-800 Network Routing Number (NRN) of the form 196-WXY-VCCZ where the Special Service Code (SCC) digits 196 identify an Inbound 1-800 call to the AT&T network.

3. The PTT's ISC forwards the 196 number to an ISC using any available international trunk.
4. The AT&T ISC functions as an Originating AT&T Switch (OAS) for these calls. The ISC looks at the NRN and creates a global title record key. This key is then used to perform a 10-digit Global Title Translation (GTT). If a match is found, the ISC/OAS determines which No. 2 Direct Services Dialing/No. 2 Network Control Point (2DSD/2NCP) pair should receive the query using the information in the GTT table.
5. If a match is not found, the ISC will default to No. 2 Signal Transfer Point (2STP) 6-digit routing to route the query to the correct 2DSD/2NCP pair.
6. Once the correct 2DSD/2NCP is determined, the ISC queries the 2DSD/2NCP with a TCAP Begin message containing a "Provide Instruction - Start" operation. The 196 NRN is included in the digits parameter. The Begin message is routed through 2STP in the Common Channel Signaling (CCS) network to the appropriate DSD NCP pair.
7. The 2DSD/2NCP that receives the TCAP Begin message converts the 196 NRN to a "Dialed Number Translation Table (DNNTT)" key. The key is used to access the DNNTT and search for a match on this number. If a match is found, the associated record is executed.
8. The 2DSD/2NCP sends an End message to ISC/OAS which instructs the switch to route and bill the call, and it provides the routing number in the routing number parameter. The routing number is an Action Point Number (APN) of the form SSS-TTT-XXXX.
9. Using Real Time Network Routing, the ISC routes the call across the AT&T network to the terminating 4ESS switch and to the NAP platform interfaced to that 4ESS switch. The Dialed Number Identification Code (DNIC) capability is used to pass the last 4-digits of the APN number to be used to identify the country from which the call originated.
10. The NAP answers the call, prompts the caller for an authorization code, collects the caller entered digits (10-digit Authorization Code + 4-Digit PIN) and validates the numbers. The language of the prompt is pre-provisioned and is determined by the DNIC code received from the 4ESS switch.

<b>If the authorization code is...</b>	<b>Then the NAP...</b>
Invalid	Re-prompts the caller for an authorization code
Valid, but not received in response to a second prompt	Plays an announcement and disconnects the call
Valid, and the customer has requested a remote update capability	Plays an announcement to the caller prompting them to enter "1" if they want a callback call, and "2" if they wish to update their callback number or customized announcement, or "9" if they have finished. If the caller enters a "9", the NAP plays an announcement "Thank You" and disconnects the call
Valid, and the customer has not requested a remote update capability	Plays an announcement "Thank You" to the caller and hangs up.

11. If the caller entered a "1" or was not subscribed to the remote update capability, the NAP generates a call to the pre-provisioned callback number. From this point, the call flow is identical to the call flow Steps 5(e) through Step 14 of the *Code Call Signaling* call flow.
12. If the caller entered a "2" in Step 10 above, the call flow proceeds with Step 4 in the *Callback Number and Customized Announcement Update* call flow.

## **Callback Number and Customized Announcement Update**

---

**2.04** This section describes a call flow supporting an update to a customer's callback number or customized announcement. This may be invoked in either of the two following ways:

### **Using the Code Calling Signaling Number:**

The caller dials a US POTS number as described in the *Code Call Signaling* call flow. If the caller does not hang up after about 30 seconds, the NAP determines if the caller has the privilege to change the callback number and their customized announcement based on the provisioned information associated with the callback number. If the caller is not allowed this privilege, the NAP does not answer. If the caller is allowed this privilege, the NAP answers the call and this call flow is executed starting at Step 1 below.

**Using the Free Phone Access Number:**

The caller dials a Free Phone number to access the NAP. The NAP prompts the user for an authorization code, collects and validates the caller entered digits and plays an announcement giving the caller the option to receive a callback call from the NAP or to change their callback number or announcement. If the caller elects to change the callback to announcement, this call flow is executed starting with Step 4.

**2.05** The following call flow is for Callback Number and Customized Announcement Update:

1. The NAP prompts the caller for an authorization code in a pre-provisioned language which is determined by the access number dialed.
2. The NAP collects and validates the caller-entered digits.
3. If the authorization code is invalid, the NAP re-prompts the caller for the authorization code. If a valid authorization code is not received in response to the second prompt, the NAP plays an announcement and disconnects the call.
4. The NAP prompts the caller to enter "1" if the caller wishes to update the callback number, "2" if the caller wishes to re-record the customized announcement, "3" if the caller wishes to discontinue use of their customized announcement, "4" if the caller wishes to activate customized announcements or "9" if the caller has finished.
5. If the caller enters "1", do the following:
  - a. The NAP prompts the user to enter the new callback number
  - b. Collects the digits provided
  - c. Validates that the callback number is of the form 1+NPA+NXX-XXXX or 011+CC+NN
  - d. Plays them back to the user
  - e. Prompts the user for a confirmation.
  - f. If the confirmation is received, the call flow continues with Step 4.
  - g. If the number is not confirmed, the caller is prompted a second time for the number. If the second number is not valid or is not confirmed, the call flow continues with Step 10.
6. If the caller enters "2", do the following:
  - a. The caller is prompted to speak their new announcement and to enter the digit "1" when finished
  - b. The NAP records the caller's announcement,

- c. The caller is prompted to enter "1" to hear the new announcement, a "2" to activate the new announcement, a "3" to re-record the announcement, or a "9" to return to the previous menu.
  - (1) if the caller enters "1", the NAP plays the new announcement to the caller. The call flow continues with Step 6c.
  - (2) If the caller enters "2", the NAP retains the new announcement for future use. The call flow continues with Step 6c.
  - (3) If the caller enters "3", the call flow continues with Step 6a.
  - (4) If the caller enters "9", the call flow continues with Step 4.
- d. If the caller enters "3", the NAP should discontinue use of a customized announcement for that callback number, but retain any existing customized announcement recording. The call flow continues with Step 5.
- e. If the caller enters "4", the NAP should use the pre-recorded customized announcement for that callback number if recorded. If no customized announcement exists for this callback number, an announcement will be played to the caller instructing them to create an announcement using the update capability. The call flow continues with Step 4.
- f. If the caller enters "9", the NAP plays an announcement indicating that the update process is complete.
- g. An AMA record is generated by the NAP for this transaction attempt and includes the following:
  - (1) Original callback number
  - (2) New callback number
  - (3) Customized announcement update indicator (Y/N)
  - (4) Connect time and date
  - (5) Authorization code.
- h. If the caller is using Free Phone access, the call flow continues with Step 10, (If the authorization code is valid, and the customer has requested a remote update capability...) of the *Free Phone Access* call flow. Otherwise, the call is disconnected.

### **3. Provisioning (Not Affected)**

### **4. Recording (Not Affected)**

## **5. Network Management (Not Affected)**

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## **6. Maintenance/Troubleshooting (Not Affected)**

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## **7. Transition Considerations**

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### **Ubiquity**

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- 7.01** It is not necessary for all 4ESS switches in the network to be running the 4E21 Release 4 Generic for this feature to be fully operational.

### **Turn On/Turn Off Mechanism**

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- 7.02** This feature is turned on automatically by software deployment.

## **8. Input/Output Manual Pages (Not Affected)**

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## **Increased Buffer Size of SS7 Satellite Nodes Using Basic Error Correction Feature (5376)**

# 14

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## Increased Buffer Size of SS7 Satellite Nodes Using Basic Error Correction Feature (5376)

# 14

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### 1. Feature Description

- 1.01** This feature enables the deployment of satellite links using the Basic Error Correction (BEC) procedure instead of the Preventative Cyclic Retransmission (PCR) procedure designed for satellite links. It is feasible to use BEC when traffic volume is low.
- 1.02** Prior to this feature, the existing method for provisioning links in the Number 2 Signal Transfer Point (2STP) via the Data Management System (DMS) user interface did not include the selection of "satellite" as a transmission medium. Therefore, when satellite links were provisioned, they were provisioned as terrestrial links with the buffer size parameter specific for satellite links being entered using the unsupported 2STP tool BADCNIDATA. This feature corrects these problems by providing a 2STP tool for the selection of satellite link medium with BEC, and allowing the audits to accept the associated link parameters. The size of the retransmission buffer has also been increased from 910 to 4000 bytes.
- 1.03** In the 4ESS™ switch, the DMS allowed for the selection of the satellite medium, but did not allow the use of BEC with satellite links. This caused the audits for NIDATA 2 to fail because the data was inconsistent. This feature permits the selection of satellite medium with BEC, and the audits now accept the link parameters for satellite links and linksets (linksets containing at least one satellite link).

## **2. Call Flow (Not Affected)**

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## **3. Provisioning (Not Affected)**

---

## **4. Recording (Not Affected)**

---

## **5. Network Management (Not Affected)**

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## **6. Maintenance/Troubleshooting**

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**6.01** Common Network Interface (CNI) audit NIDATA 2 has been modified to allow a retransmission buffer size (RXQLEN) value of 4000 when the medium for the link is satellite.

**Table 14-A. Parameter Values for 56 kbps Satellite Links**

<b>Parameter Name</b>	<b>Function</b>	<b>RC Value</b>
MTP T1.111.3 Timer T7	Delay of Acknowledgment	2 sec.
RXQLEN	Retransmission Buffer	4000 bytes
MTP T1.111.4 Timer T1	Delay to avoid missequencing in changeover	0.8 sec.
MTP T1.111.4 Timer T2	Waiting for changeover acknowledgment	1.3 sec.
MTP T1.111.4 Timer T3	Delay to avoid missequencing in changeback	0.8 sec.
MTP T1.111.4 Timer T4	Waiting for changeback acknowledgment (1st try)	1.1 sec.
MTP T1.111.4 Timer T5	Waiting for changeback acknowledgment (2nd try)	1.1 sec.
MTP T1.111.4 Timer T6	Delay to avoid missequencing on controlled rerouting	0.8 sec.

**Table 14-B. Parameter Values for 56 kbps Links in a Linkset**

<b>Parameter Name</b>	<b>At least one SATELLITE link in the linkset</b>	<b>All TERRESTRIAL links in the linkset</b>
RXQLEN Retransmission Buffer	4000 bytes	910 bytes
MTP T1.111.4 Timer T1	0.8 sec.	0.5 sec.
MTP T1.111.4 Timer T2	1.3 sec.	0.7 sec.
MTP T1.111.4 Timer T3	0.8 sec.	0.5 sec.
MTP T1.111.4 Timer T4	1.1 sec.	0.5 sec.
MTP T1.111.4 Timer T5	1.1 sec.	0.5 sec.
MTP T1.111.4 Timer T6	0.8 sec.	0.5 sec.

**⇒ NOTE:**  
NIDATA 2 audit may fail when major state of link is unavailable and RXQLEN is 4000.

## **7. Transition Considerations**

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### **Ubiquity**

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**7.01** Full ubiquity of the 4E21 Release 4 Generic is not required before turning this feature on. Although this feature will be deployed at all 2STP and 4ESS switch sites, it will only apply to those sites that are equipped with satellite links.

### **Turn On/Turn Off Mechanism**

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**7.02** This feature is turned on by DMS (Ring Recent Change).

**⇒ NOTE:**  
Before satellite links can be grown, 2STP10.1.1 is required.

## **8. Input/Output Manual Pages (Not Affected)**

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**800 Call Prompter, Interim  
Speech Recognition Capability  
for ISAIC Call Prompt Feature  
(5529)**

# 15

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## **800 Call Prompter, Interim Speech Recognition Capability for ISAIC Call Prompt Feature (5529)**

# 15

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### **1. Feature Description**

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**1.01** Until Automatic Speech Recognition (ASR) is available on Improved Service Announcement and Information Collection (ISAIC), this feature provides speech recognition to the Social Security Administration 800 Service callers via the Network Services Complex (NSCX) frames. Callers identifying themselves as originating a call from a Touch Tone telephone are handled by ISAIC high-capacity call prompting capability. Rotary phone callers are handled by NSCX's Speech Recognition capabilities for their call prompting needs.

### **2. Call Flow**

---

**2.01** There are two possible call flow scenarios for this feature: One for callers using a Touch Tone telephone and the other for callers using a rotary dial phone.

**2.02** The following is a high level call flow description for a caller using a Touch Tone telephone with this feature:

1. The caller dials the Social Security Agency 800 number and accesses feature functionality provisioned under the regular Customer Account (accounting 999A).
2. In the first caller interaction, ISAIC plays a rotary screening announcement/prompt.
3. The caller enters Dual Tone Multifrequency (DTMF) input.

4. ISAIC collects the DTMF information.
5. The 4ESS™-2000 switch sends the information to the No. 2 Dialed Services-Dialed Number Base/No. 2 Network Control Point (2DSD/2NCP).
6. The call is processed as per customer account 999A.
7. End of Call.

**2.03** The following is a high level call flow description for a caller using a rotary dial phone with this feature:

1. The caller dials the Social Security Agency 800 number.
2. The caller does not enter DTMF input.
3. ISAIC times out.
4. The 4ESS-2000 switch sends a "no digits entered" message to the 2DSD/2NCP.
5. The 2DSD/2NCP returns an End message for the 4ESS-2000 switch to route the call. The routing number is a Network Routing Number (NRN) in the Plain Old Telephone Service (POTS) domain.
6. The 4ESS-2000 switch will translate NRN which will result in a DSD type, Initial Query ANI Request (IQAR) call data value.
7. The 4ESS-2000 switch checks the `dbl_dip_flg` in the call register.
8. **If the `dbl_dip_flg` is set**, the call receives final handling treatment (existing final handling FH code 1618, `BAD_ROUTING_DATA`) with the next Exception Code 185, `EXCESSIVE_DIPS`.
9. **If the `dbl_dip_flg` is not set:**
  - A. The 4ESS-2000 switch launches a query to a 2DSD/2NCP and sets the `dbl_dip_flg`.
  - B. The 2DSD/2NCP executes the ASR Customer Account (account 999B) and requests that the 4ESS-2000 switch play an NSCX automatic speech recognition (ASR) announcement/prompt.
  - C. The caller interacts with the NSCX.
  - D. NSCX collects the customer entered information and sends the data to the 2DSD/2NCP via the 4ESS-2000 switch.
  - E. The call is processed as per Customer Account 999B.
  - F. The 4ESS-2000 switch routes and records the call based on the information provided by Customer Account 999B. Part of this information is a derived 800 number returned by the 2DSD/ 2NCP in the Dialed Number parameter.

10. End of call.

### **3. Provisioning**

---

**3.01** The customer Account records needed to enable this feature are provisioned using current systems and procedures. Announcements/prompts in Set-S and Set-C are provisioned following existing processes.

### **4. Recording (Not Affected)**

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### **5. Network Management (Not Affected)**

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### **6. Maintenance/Troubleshooting (Not Affected)**

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### **7. Transition Considerations**

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#### **Ubiquity**

---

**7.01** It is necessary for all 4ESS-2000 switches in the network to be running the 4E21 Release 4 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)**

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## Abbreviations and Acronyms

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### 2

#### 2DSD

No.2 Dialed Services-Dialed Number  
Base

#### 2NCP

No. 2 Network Control Point

#### 2STP

No. 2 Signal Transfer Point

---

### A

#### AMA

Automatic Message Accounting

#### ANI

Automatic Number Identification

#### APN

Action Point Number

#### ASN

AT&T Switch Network

#### ASR

Automatic Speech Recognition

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### B

#### BCS

Business Communications Services

#### BEC

Basic Error Correction

#### BLDS

Business Long Distance Services

#### BLM

Base Level Maintenance

---

### C

#### CAL

Customer Account Logic

#### CC

Country Codes

#### CCS

Common Channel Signaling

#### CCS7

Common Channel Signaling 7

#### CDAS

Call Data Acquisition System

#### CDR

Call Detail Recording

#### CDRP

Call Detail Recording Platform

#### CDSC

Custom Data Service Cabinet

#### CDSU

Custom Data Service Unit

#### CDSU-II

Custom Data Service Unit-Phase 2

#### CLI

Calling Line Identity

#### CNI

Common Network Interface

#### CNRDB

Common National Routing Data Base

#### CSR

Carrier Specific Routing

**CTA**  
Call Turn Around

---

**D**

**DCN**  
D-Channel Nodes

**DID**  
Direct Inward Dialing

**DIF**  
Digital Interface Frame

**DMS**  
Data Management System

**DNIC**  
Dialed Number Identification Code

**DSA**  
Dialed Services ANI Based

**DTMF**  
Dual Tone Multifrequency

**DUP**  
Data User Part

---

**E**

**EB**  
Extended Bus

**EO**  
End Office

---

**F**

**FAI**  
Foreign Administration Identifier

**FENPA**  
Far End Numbering Plan Area

**FHC**  
Final Handling Code

**FIC**  
Frame Identification Code

**FRU**  
Field Replaceable Unit

---

**G**

**GLFN**  
Grid, Lineup, Frame Number

**GSS**  
Global System Status

**GTT**  
Global Title Translation

---

**H**

**HDRNC**  
High Density Ring Node Cabinets

**HDU**  
Hard Disk Unit

---

**I****I800**

International 800

**IC**

InterLATA Carrier

**ICDR**

International Call Detailed Record

**IDDD**

International Direct Distance Dialing

**ILD**

International Long Distance

**IQAR**

Initial Query ANI Request

**ISAIC**Improved Service Announcement and  
Information Collection**ISC**

International Switching Center

**ITN**

Integrated Test Network

**IWZ1**

International World Zone 1

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**L****LAN**

Local Area Network

**LEC**

Local Exchange Carrier

---

**M****MCT**

Multiple Carrier Treatment

**MIP**

Multifunctional Interface Processor

---

**N****NAP**

Network Adjunct Platform

**NCP**

Network Control Point

**NEMOS**Network Management Operation  
System**NESAC**National Electronic Switching  
Assistance Center**NPA**

Numbering Plan Area

**NRA**

Network Remote Access

**NRN**

Network Routing Number

**NSCX**

Network Services Complex

---

**O****OAS**

Originating AT&amp;T Switch

**OC**  
Operating Company

**OCN**  
Operating Company Number

**ONPA**  
Originating Numbering Plan Area

**OSOR**  
On-Site Operations Report

**OSS**  
Operating Support System

---

**P**

**PBX**  
Private Branch Exchange

**PCC**  
Pseudo Country Codes

**PCM**  
Pulse Code Modulation

**PCP**  
Positive Call Processing

**PCR**  
Preventative Cyclic Retransmission

**PDF**  
Power Distribution Frame

**PECC**  
Product Engineering Control Center

**POTS**  
Plain Old Telephone Service

**PRT**  
Proportional Routing Table

**PTT**  
Public Telephone and Telegraph

---

**R**

**RAM**  
Random Access Memory

**RC/V**  
Recent Change/Verify

**RNMS**  
Regional Network Management System

---

**S**

**SAB**  
Sub-Account Billing

**SADC**  
Special Access Data Control

**SCC**  
Service Circuit Controller

**SCC**  
Special Service Code

**SCS**  
Service Circuit System

**SCT**  
Service Count Tracer

**SCU**  
Service Circuit Unit

**SDN**  
Software Defined Network

**SES**  
Service Evaluation System

**SIC**  
Service Indicator

**SSA**  
Small Scale Adjunct

**SSIRNC**

Small Scale Integration Ring Node  
Cabinets

---

**T**

**TA**

Telecommunication Administration

**TCAP**

Transaction Capabilities Application  
Part

**TCC**

Technical Control Center

**TLP**

Trouble Locating Procedure

**TM**

Trunk Maintenance

**TSG**

Trunk Subgroup

**TSI**

Time Slot Interchange

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**X**

**XTSI**

Expanded Time Slot Interchange