Lucent Technologies
Bell Labs Innovations

4ESS™ Switch
Product Release Document

4E22 Release 1 Generic

234-090-221AC
Issue 1
January 1997

Notice

Every effort was made to ensure that the information in this document was complete and accurate at the time of printing. However, information is subject to change.

Trademarks

4ESS is a trademark of Lucent Technologies.
5ESS is a trademark of Lucent Technologies.
TrueVoice is a trademark of AT&T.
ALLIANCE is a trademark of AT&T.
Acculink is a trademark of AT&T.

Ordering Information

The ordering number for this document is Lucent Technologies 234-090-221AC. To order this document, call 1-800-432-6600. For more ordering information, refer to "How to Order Documentation" in the section "About This Document."

Support Telephone Number

Lucent Technologies provides a telephone number (1-800-334-0404) for you to use to report errors or to ask questions about the information in this document.

Developed by Lucent Technologies Network Systems TSVS Information Development.

How Are We Doing?

Document Title: ***4ESS***™ **Switch Product Release Document 4E22 Release 1 Generic**

Document No.: 234-090-221AC Issue 1 Date: January 1997

Lucent Technologies welcomes your feedback on this document. Your comments can be of great value in helping us improve our documentation.

1. Please rate the effectiveness of this document in the following areas:

	Excellent	Good	Fair	Poor	Not Applicable
Ease of Use					////////////////////
Clarity					////////////////////
Completeness					////////////////////
Accuracy					////////////////////
Organization					////////////////////
Appearance					////////////////////
Examples					
Illustrations					
Overall Satisfaction					////////////////////

2. Please check the ways you feel we could improve this document:

- ☐ Improve the overview/introduction
- ☐ Improve the table of contents
- ☐ Improve the organization
- ☐ Include more figures
- ☐ Add more examples
- ☐ Add more detail
- ☐ Make it more concise/brief
- ☐ Add more step-by-step procedures/tutorials
- ☐ Add more troubleshooting information
- ☐ Make it less technical
- ☐ Add more/better quick reference aids
- ☐ Improve the index

Please provide details for the suggested improvement. _____

_____

3. What did you like most about this document?

_____

_____

4. Feel free to write any comments below or on an attached sheet.

_____

_____

_____

_____

If we may contact you concerning your comments, please complete the following:

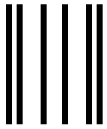
Name: _____ Telephone Number: _____

Company/Organization: _____ Date: _____

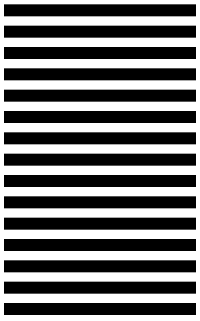
Address: _____

When you have completed this form, please fold, tape, and return to address on back or Fax to: 910-727-3043.

Do Not Cut—Fold Here And Tape



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



Lucent Technologies
Bell Labs Innovations

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1999 GREENSBORO, N.C.

POSTAGE WILL BE PAID BY ADDRESSEE

DOCUMENTATION SERVICES
2400 Reynolda Road
Winston-Salem, NC 27199-2029

Contents Page

Contents **Page**

Contents **Page**

Contents **Page**

Contents **Page**

Contents **Page**

Contents **Page**

Contents **Page**

Contents **Page**

Contents **Page**

Contents **Page**

Contents **Page**

Contents **Page**

Contents **Page**

Figures

Contents **Page**

Tables

Contents **Page**

About This Document

1. Purpose

1.01 The purpose of the Product Release Document (PRD) is to provide customers with information pertaining to the new features that are introduced in the *4ESS*™ switch. A PRD is written to cover the features introduced in full generic releases and quarterly generic releases. This particular PRD provides information pertaining to the new features included in the 4E22 Release 1 Generic.

2. Scope

2.01 The Product Release Document provides customers with information not covered in other *4ESS* switch documentation. It is not a replacement for other documentation such as Standard 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 4E22 Release 1 features, not the long-term maintenance. Since other documentation is used for the operation and maintenance of features after their introduction into the *4ESS* switch, this PRD will not be reissued.

3. Intended Audience

3.01 This document is intended for people involved in testing, provisioning, maintenance, administration, and technical support of the *4ESS* switch. Feature managers, Integrated Test Network (ITN) personnel, field support, Network Control Center (NCC), Product Engineering Control Center (PECC), and National Electronic Switching Assistance Center (NESAC) personnel are examples of some of the people who will use the PRD.

4. How to Use This Document

4.01 The PRD for 4E22 Release 1 Generic contains 26 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: *Service Circuit System TN400B and TN1972C Replacement Feature (471)*

The disk for two disk packs in the Service Circuit System (SCS), has been discontinued. The HP 2GB disk (c3325a) is used to replace the discontinued disk.

Chapter 2: *Redesign of Service Circuit Unit EPIC Feature (472)*

The ALU chip on the Enhanced Peripheral Interface Controller (EPIC) TN 1976 circuit pack in the Service Circuit Unit (SCU) has been discontinued. This feature provides a replacement ALU chip.

Chapter 3: *Checksum Macro Feature (473)*

This feature adds a checksum verification macro to the copy commands. Both the actual and expected checksum are returned to the 1B processor, and if the two do not match, an error will be displayed.

Chapter 4: *Program Store Expansion Feature (3333)*

This feature is the second part of a 2-part program to add 1 M word of Program Store (PS) memory in the 1B Processor. Program text associated with call processing features normally resides in PS memory for performance reasons. Presently, the 1B Processor supports a memory spectrum of 2 Mega-Words (MW) of PS and 6 MW of Call Store (CS).

Chapter 5: *XTSI Release 2, with DS3 and SPU Select for Service Control Feature (4043/5131)*

The second release of the Expanded Time Slot Interchange (XTSI) provides basic echo cancellation and *TrueVoice* on the XTSI. Service Control after two Digital signal-level 3 (DS3) or two Signal Processing Unit (SPU) fail on XTSI allows the switch owner the ability to choose which service group is to continue providing service via the spare, and which are to remain out of service.

Chapter 6: *Elimination of Via Routed Calls to Out-of-Service Switches Feature (4438)*

This feature corrects a problem that has caused calls to be routed improperly. In certain circumstances, a disabled, out-of-service switch can appear to be in-service to other switches. When this occurs, the direct trunks to the disabled switch are also disabled, but Real Time Network Routing (RTNR) will try to route calls to the switch anyway, using stored Via information. This feature corrects this problem by temporarily disabling use of the stored Via information when repetitive attempts to route through the stored Via fail.

Chapter 7: *Call Detail Recording Platform (CDRP) and Multiple **4ESS**™ Switch Streams Interface Feature (4464)*

This feature replaces the Small Computer System Interface (SCSI) Nodes (SINs), which provide an interface between the 3B Processor and the Call Detail Recording Platform (CDRP), with Ethernet Interface Nodes (EINs). This will allow the CDRP to support multiple *4ESS*™ switches.

Chapter 8: *Direct Link Node Integrated Ring Node 2 Upgrade Feature (4694)*

This is a hardware feature that upgrades the Direct Link Node (DLN) Node Processor (NP) from an Integrated Ring Node (IRN) with an Intel 80186 processor to an IRN2 with an Intel 80386 processor, and will provide the following enhancements:

- An increase in the CCS7/Q.931 message-handling capacity to 1800 messages/second in each direction, per DLN.
- An increase in the amount of usable memory to allow more efficient message/data exchange between the DLN-NP and the DLN-Attached Processor (AP).
- An increase the DLN capacity to meet the expected increase in busy-hour call volume.

Chapter 9: *International Switching Center (ISC) Composite Enhancement Feature (4760a)*

This feature provides two enhancements to the original International Switching Center (ISC) Composite Enhancement Feature (4760), which was introduced in 4E21 Release 2 Generic. In addition, this feature removes the Continuity OK Test (COT) on Integrated Services Digital Network-User Part (ISUP) Circuits for Final Handling Code 1877 Feature (4603), which is no longer required.

Chapter 10: *End-to-End Class-of-Service (ECOS) Areas Increase Feature (4776)*

This feature provides the following two enhancements to the End-to-End Class-of-Service (ECOS) and ECOS/Automatic Provisioning (Ecos/AP) Features 3142/4018:

- The maximum number of ECOS AREAS for each *4ESS*™ switch is increased from 127 to 255. As a result, the maximum number of AREA/ECOS Routing Pattern Identity (ERPI) combinations for each *4ESS* switch is increased from 4,095 to 8,191.
- The maximum number of ECOS AREAS which may be provisioned in a switch is now an engineerable quantity.

Chapter 11: *CDRI Communications Web (4800)*

This feature affects the Call Detail Reporting Infrastructure (CDRI) terminal equipment at remote *4ESS* switches and at host *4ESS* switch/CDRP locations, adding several new capabilities.

Chapter 12: *Served Number Plan Area Expansion and Home Numbering Plan Area Improvements Feature (4839)*

This feature provides more capacity for switches to handle new Numbering Plan Areas (NPAs) and makes the provisioning of NPA splits easier.

Chapter 13: *Attached Processor Interface (API) Capacity Improvement Feature (5003)*

This feature improves the throughput capacity of the Attached Processor Interface (API) by reducing the impact of Common Channel Signaling System 7 (CCS7) ISDN User Part (ISUP) messages. This results in an improvement in overall *4ESS* switch call-handling capacity, and helps to prevent an expected bottleneck in the busy-hour call capacity of the switch.

Chapter 14: *1B Processor Tape Unit Elimination Feature (5013)*

This feature provides the requirements for eliminating the 1B Processor Data Unit Selector (DUS) Tape Unit Controller (TUC) and explains the transition of functions from the 1B Processor to the 3B Attached Processor System (APS).

Chapter 15: *Expanded Time Slot Interchange in Input/Output Messages Feature (5111b)*

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.

Chapter 16: *XTSI Software Update Tool Feature (5113a)*

This feature is a streamlined version of the software update tool. Maintenance personnel can log onto a 1B and a 3B maintenance channel and input one short 3B command to execute any of the nine steps required to update a single *4ESS*™ switch XTSI frame.

Chapter 17: *Carrier-Solutions Carrier Identification Code (CIC) Based Determinations Feature (5198)*

The Market Service Description (MSD) states that the Regional Bell Operating Companies (RBOCs) and General Telephone and Electronics (GTE) as a group, are estimated to capture 30 percent of the long distance market within five years. To mitigate the effect of market share erosion on revenues and unit network costs, AT&T is aggressively pursuing this group as wholesale AT&T customers or resellers.

With this feature, AT&T is able to offer long distance transport services to resellers based on Carrier Identification Code (CIC). AT&T can now bill the reseller, instead of the caller, based on the CIC sent by the Local Exchange Carrier (LEC) switch with the call. With CIC-based determination, AT&T informs the LEC to route the reseller carrier's traffic on the 10288 switched access trunk groups to the *4ESS*™ switch.

Chapter 18: *800 Service Direct Services Dialing Fix Feature (5252)*

This feature corrects a situation in which the *4ESS*™ switch played a vacant code announcement rather than the final handling code selected by the customer.

Chapter 19: *Modification to FRF #4867, TCS 3.0 Feature (5578)*

This feature provides an additional capability to the Transfer Connect Service 3.0. It allows the Adjunct to send an application error and call status information Out-of-Band to a Redirecting Party that sends OOB redirection requests to the Adjunct.

Chapter 20: *SDN Access via Network Adjunct Platform Feature (5579)*

Software Defined Network (SDN) Access via the Network Adjunct Platform (NAP) (SDAN) allows the NAP to originate an SDN call into the AT&T Switched Network (ASN) over a Small Scale Adjunct (SSA) Primary Rate Interface (PRI) line. SDAN capability provides the NAP with the capability to support an SDN access arrangement.

Chapter 21: *Modifications to Software Defined Network (SDN) Network Remote Access (NRA) Using Automatic Speech Recognition (ASR) Feature (5589)*

Feature 5589 introduces two modifications for the SDN NRA Using ASR feature. First, the *4ESS*™ switch now reports a disconnect trigger to the ATP for generic action processing after playing the NCP Call Denial Announcement. If the ATP has already been invoked, the disconnect trigger will initiate a TCAP BEGIN message from the *4ESS* switch to 2DSA NCP and as a result the caller will be able to make a sequence call. Secondly, the *4ESS* switch now populates the Set S bit in the CAC parameter only when Set S (DTMF) channels are available.

Chapter 22: *Set S Dual Tone Multifrequency (DTMF) to Automatic Speech Recognition (ASR) Switching Feature (5591)*

The Set S DTMF-to-ASR Switching feature (5591) allows the *4ESS*™ switch to reroute a call to an ASR port on ISIAC, if one is available. The feature enables switching a call in ISAIC from Set S DTMF-only channels to Set S ASR/DTMF channels when Set S ASR/DTMF is requested anytime after the call has already been connected to Set S DTMF-only resources. Once the call has been switched, the call must remain on the ASR/DTMF channel for the remainder of the call, which can accommodate any requests that follow.

Chapter 23: *CPN Anomaly Reports Feature (5594)*

This feature is needed to determine how often IAM messages are received from non-AT&T switches without the CPN. This includes LECs, LEC resellers, and PBXs directly connected via ISUP.

Chapter 24: *ISDN Called Party Number Protocol Upgrade Feature (5613)*

This feature provides capabilities to accept the Called Party Number Information Element in the Q.931 Setup message with the Type of Number and Numbering Plan fields both coded as "unknown", and to interpret the digits contained in the Called Party Number IE as if they had been received with a Type of Number/Numbering Plan Identification code as "National" and "ISDN", respectively.

Chapter 25: *ODA Datalinking Software Tool Enhancements Feature (5704)*

This feature provides a software tool enhancement which will reduce or eliminate transmission errors when using the ODAD link.

Chapter 26: *Extend ACM Timer for CCS7 Feature (5724)*

This feature allows the value for the ACM timer used by the *4ESS*™ switch to be either 20 seconds or 25 seconds, depending on whether the feature is provisioned as off or on for the switch.

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

5. Product Safety Labels

5.01 There are three types of safety labels used in 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.

6. How to Comment on This Document

6.01 Lucent Technologies welcomes your comments on this document. Your comments will aid us in improving the quality and usefulness of Lucent Technologies documentation. Please use the Feedback Form provided in the front of this document [mail in or fax (1-910-727-3043)] or call the Lucent Technologies Documentation Comment Hot-Line Service (1-800-334-0404) to make your comments.

7. How to Order Documentation

7.01 Additional copies of this document, and all referenced documentation, may be ordered from the Lucent Technologies Customer Information Center (CIC). To order copies by mail, Lucent Technologies employees should mail Form IND 1-80.80, which is available from the Lucent Technologies Customer Information Center, to the following address:

Lucent Technologies Customer Information Center
Attention: Order Entry Department
2855 N. Franklin Road
P. O. Box 19901
Indianapolis, Indiana 46219-1999

NOTE:
When ordering documentation from the Lucent Technologies Customer Information Center, each Lucent Technologies Business Unit/Division must be identified and all required billing information must be provided.

7.02 Orders can also be placed by phone Monday through Friday by calling one of the following numbers:

Within the United States: 1-800-432-6600

From Canada: 1-800-255-1242

Worldwide: Toll 317 322-6577

FAX: 317 322-6484

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

7.04 Federal Government orders must be processed through CIC.

Service Circuit System TN4000B and TN1972C Replacement Feature (471)

1

Contents **Page**

Service Circuit System TN4000B and TN1972C Replacement Feature (471)

1

1. Feature Description

1.01 The disk for disk packs TN4000B and TN1972C in the Service Circuit System (SCS) has been discontinued. The HP 2GB disk (c3325a) is used in these packs to replace the discontinued disk. Some cable redesign is also involved.

1.02 The order codes for the new disk packs remains the same as the order codes for the discontinued disk packs.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS*™ switches in the network to be running the 4E22 Release 1 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism (Not Applicable)

8. Input/Output Manual Pages (Not Affected)

Redesign of Service Circuit Unit Enhanced Peripheral Interface Controller Feature (472)

2

Contents **Page**

Redesign of Service Circuit Unit Enhanced Peripheral Interface Controller Feature (472)

2

1. Feature Description

1.01 The Arithmetic Logic Unit (ALU) chip on the Enhanced Peripheral Interface Controller (EPIC) TN1976 circuit pack in the Service Circuit Unit (SCU) has been discontinued. This feature provides a replacement ALU chip.

1.02 The manufacturer discontinued the production of the CY7C9101 ALU chip in the "through hole" package style used on the TN1976. However, the manufacturer still produces a surface mounted version of the same chip. Therefore, the TN1976 circuit pack has been modified to use the surface mounted version. The order number for the surface mounted version is CY7C9101-30JC.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS*™ switches in the network to be running the 4E22 Release 1 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)

Checksum Macro Feature (473)

3

Contents **Page**

Checksum Macro Feature (473)

3

1. Feature Description

1.01 Prior to the Checksum Macro feature, two copy commands (copy:tsifile and copy:xtsi) did not do any verification after completing successfully. As a result, technicians would have to use other methods to verify that the copy command had executed successfully. This extra step added unnecessary overhead to some applications that used the copy commands.

1.02 This feature adds a checksum verification macro to the copy commands. Both the actual and expected checksum are returned to the 1B processor, and if the two do not match, an error will be displayed.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

7.01 It is necessary for all *4ESS*™ switches in the network to be running the 4E22 Release 1 Generic for this feature to be fully operational.

7.02 New Electrically Programmable Read Only Memory (EPROM) must be installed in the UN548 circuit pack (x:y) before the new software release is installed.

Turn On/Turn Off Mechanism

7.03 This feature is turned on automatically by software deployment.

8. Input/Output Manual Pages

8.01 The two copy commands referred to above (copy:tsifile and copy:xtsi) are modified by this feature.

Program Store Expansion Feature (3333)

4

Contents **Page**

Program Store Expansion Feature (3333)

4

1. Feature Description

1.01 This feature is the second part of a 2-part program to add 1 M word of Program Store (PS) memory in the 1B Processor. Memory expansion is required because the development of new services is accelerating, thereby generating program text at an increasing rate. Program text associated with call processing features normally resides in PS memory for performance reasons. Presently, the 1B Processor supports a memory spectrum of 2 Mega-Words (Mw) of PS and 6 Mw of Call Store (CS). Only 5 Mw of the CS will be available for use, while the remaining 1 Mw is reserved.

1.02 The conversion of 1 Mw of CS to PS is called Program Store Expansion (PSE). The PSE increases the maximum Program Store from 2 Mw to 3 Mw minus 64 Kw and alters the PS/CS split from 2 Mw/(6 Mw - 64 Kw) to (3 Mw - 64 Kw)/5 Mw.

NOTE:
The CS and PS MCODES are defined as bits 28 - 20 of an address. Unless otherwise stated, MCODES are given in octal and range from 000 to 777. Sometimes MCODES are identified as 0 through 7. This is an abbreviated representation of physical MCODES 770 through 777, respectively.

1.03 The PS MCODE 777 includes a 64 Kilo-Word (Kw) range for addressing MMIO, Boot ROM, and the Buffer Bus. Therefore, 64 Kw of usable PS address space is lost.

1.04 The first part in this program occurred in 4E21 Release 1, when the initial Program Store Expansion Feature (3333a) was introduced. This feature, 3333, represents the final part of the program, since its purpose is to implement the software and hardware capabilities that were allocated with Feature 3333a.

1.05 Implementation of Feature 3333 is automatic with the deployment of 4E22 Release 1 software, provided the requirement noted in the Provisioning part of this chapter has been completed:

1.06 Only 25 percent of the additional Program Store memory provided by Feature 3333 will be disk-backed in 4E22 Release 1; 100 percent will be disk-backed in 4E23 Release 1.

1.07 The address range of the added disk-backed core area in 4E22 is 34000000-34577777.

1.08 The address range used for MMIO, Boot ROM, and Buffer Bus etc. is 37600000-37777777.

1.09 For additional information on the Program Store Expansion Feature (3333a), refer to the *4ESS™ Switch Product Release Document* (234-090-211AC).

2. Call Flow (Not Affected)

3. Provisioning

3.01 Office Data Assembler (ODA) Form 407V was modified in 4E21 Release 4 to include the Unitype CC for Program Store Expansion (Circuit Pack KLW 122). This feature requires the setting of the Program Store Memory indicator, which is accomplished by making the following entries on ODA Form 407V:

- HV = Y
- SD-Number = SD4A148-03 and SDA4A149-03
- J-Drawing = J4A023AC-1 and J4A023AD-1.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

6.01 The additional duplex PS will be integrated as part of the 1B Processor PS subsystem. Therefore, the recovery, configuration, and maintenance strategies for PSE are identical to PS. Error-free access to all PS data will be maintained by the system/fault recovery programs.

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS*™ switches in the network to be running the 4E22 Release 1 Generic for this feature to be operational.

Turn On/Turn Off Mechanism

7.02 This feature is turned on automatically with software deployment, provided the following requirements have been completed:

- Installation of the software and hardware associated with Feature 3333a
- The setting of the Program Store Memory indicator described in the Provisioning Section of this chapter.
- This feature has no turn-off mechanism.

8. Input/Output Manual Pages (Not Affected)

XTSI Release 2, with DS3 and SPU Select for Service Control Feature (4043/5131)

5

Contents **Page**

XTSI Release 2, with DS3 and SPU Select for Service Control Feature (4043/5131)

5

1. Feature Description

1.01 The second release of the Expanded Time Slot Interchange (XTSI) provides basic echo cancellation and *TrueVoice* on the XTSI. This added functionality is accomplished through a Signal Processing System (SPS) circuit pack that plugs directly into available slots in the XTSI frame. This feature simplifies wire center architecture, increases reliability, and increases integration between SPS capabilities and *4ESS*™ switch call processing capabilities.

1.02 The Digital Signal-level 1 (DS1) performance monitoring is also enhanced so it is comparable to the Universal Services Echo Canceler (USEC). In XTSI Release 1, the DS1 performance monitoring was comparable to the DIF.

1.03 Service Control after two Digital Signal-level 3 (DS3) or two Signal Processing Units (SPUs) fail on XTSI allows the switch owner to choose which service group is to continue providing service via the spare, and which are to remain out of service.

1.04 The XTSI is highly reliable. When a DS3 service group fails, the *4ESS* switch reconnects the line to spare equipment so no loss of service occurs. If a second DS3 fails before replacement of the first failed service group in the same failure group, service on the second failed group will be lost. The select for service capability allows the switch owner to keep providing service to the group that best serves their business interests.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management

Support System Interfaces

A. Network Management Operations System (NEMOS)

- The 30 second discrete which the *4ESS* switch sends to NEMOS includes the status of all XTSIs.
- If an XTSI experiences a service degrading failure, the *4ESS* switch includes the XTSI and the type and identifier of the service group which failed, in response to a request from NEMOS for service degrading data.

Manual Control

A. Select for Service

This capability is provided for both DS3 and SPS service groups. Upon acceptance of a select for service request, the switch takes the following actions:

- If the request refers to a DS3 service group, the switch immediately takes out of service all DS0s currently being served by the spare equipment.
- The switch disconnects the spare equipment from the DS3 line it is currently serving.
- The switch restores service to the customers served by the specified service group.

5.01 The *4ESS* switch accepts the requests that identify the type of service group to be selected for service or is identified by a sub-member number. The switch returns a message indicating the request was accepted and upon completion returns a message that action was completed.

5.02 The *4ESS* switch rejects the request if the service group selected is already in service. The switch returns a message indicating the request was rejected and the reason for rejection.

6. Maintenance/Troubleshooting

Fault Recovery

6.01 Fault recovery function includes these basic capabilities:

- Error Analysis
- System Recovery Phases
- Fault Isolation
- Configurations
- Diagnostic Control
- Alarms
- Manual Requests
- Peripheral Utilities
- Audits
- Operating System.

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS* switches in the network to be running the 4E22 Release 1 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

8.01 The following Input/Output messages have been modified with the introduction of this feature.

- IM INIT:DGSTAT
- IM INIT:PMSTAT
- IM OP:DGSTAT
- IM OP:PMSTAT
- IM STOP:OP-PMSTAT
- IM SW:XTSI
- IM VER:TRKNAME
- IM VER:VFUNC
- OM INIT:PMSTAT
- OM OP:PMSTAT
- OM REPT:CIN
- OM REPT:OTAN
- OM SET:TRKSTAT
- OM SW:XTSI
- OM VER:MISC-SUXTSI
- OM VER:MISC-XTSID3U
- OM VER:TRKNAME
- OM VER:VFUNC-XTSISP
- PIM VER:TRK-TAN
- PIM VER:TSG-SPU
- PIM VER:VFUNC
- PIM VER:VFUNC-XTSIPM
- PIM VER:VFUNC-XTSPUD
- PIM VER:VFUNC-XTUNAS
- POM VER:MISC-XTSIPM
- POM VER:SUBUTP-XTSIS
- POM VER:TRK-XSPU

- POM VER:TRK-XTSPUDG
- POM VER:TRK-XTUNASPU
- POM VER:TRK-TSGSPU.

Elimination of Via Routed Calls to Out-of-Service Switches Feature (4438)

6

Contents **Page**

Elimination of Via Routed Calls to Out-of-Service Switches Feature (4438)

6

1. Feature Description

1.01 This feature corrects a problem that has caused calls to be routed improperly. In certain circumstances, such as in the disruption caused by the Sherman Oaks earth quake in California, a disabled, out-of-service switch can appear to be in-service to other switches. When this occurs, the direct trunks to the out-of-service switch are also disabled, but Real Time Network Routing (RTNR) continues to route calls to the disabled switch anyway, using stored Via information.

1.02 This feature corrects the problem described above by temporarily disabling use of the stored Via information when repetitive attempts to route through the stored Via fail.

Background

1.03 With RTNR, a call first attempts to route from an originating AT&T switch (OAS) to a terminating AT&T switch (TAS) via direct Trunk Subgroups (TSGs). If this route is unavailable, the call tries to route through a Via AT&T switch (VAS).

1.04 The VAS is selected through an exchange of information [such as a Transaction Capabilities Application Part (TCAP) Bit Map Query] between the OAS and the TAS. A VAS is chosen based on OAS, TAS and Route Pattern Identity (RPI) of the call. A VAS is selected each time a call requires a Via route, either before or after the call arrives at the OAS.

1.05 The ID of a VAS is stored in the *4ESS*™ switch each time the VAS is selected for a call. This stored Via information is available for use whenever a new determination for the best VAS cannot be made for the call. An example of this is when an OAS sends a TCAP Bit Map Query to a TAS to determine the best VAS, but the query fails. When this occurs, the stored Via information from the last query is used to route the call. This stored Via information is reused over and over as the via path, until the condition that caused the query to fail is corrected. A separate stored Via path is also maintained for every OAS/TAS/RPI combination.

1.06 When a *4ESS* switch fails, as it did during the earth quake at Sherman Oaks, California, the AT&T network acts to prevent calls from being routed to a disabled switch. The network typically attempts to select a Via route by sending a TCAP Bit Map Query message over the 2 Signaling Transfer Point (STP) network. If that fails, the query message is sent over the Alternate Signaling Transport network (ASTN). If the ASTN determines that all network routes to the victim switch are unavailable, the ASTN will initiate an MC3 condition at the Originating AT&T switch (OAS) for the victim switch.

1.07 During the earth quake, Sherman Oaks was powered-down and all of its F-links were taken out-of-service before they failed completely. This short-circuited the condition that would have allowed the ASTN to mark the head cells of the direct TSGs to the distressed switch with an MC3 indicator. As a result, network routing did not recognize the out-of-service condition, and it continued to send calls to the Sherman Oaks switch, using the same stored Via information for each OAS/TAS/RPI combination. This put heavy stress on the stored Via switch, causing near-machine congestion, and threatened to propagate the problem through the network.

1.08 As mentioned previously, this feature corrects the problem described above by temporarily disabling the use of stored Via information. As described below, the *4ESS* switch keeps count of the number of crankbacks that are received when attempting to route calls using stored information, and uses this information with information about TCAP timeouts to determine when to temporarily disable use of stored Via information.

Specific Feature Capabilities

1.09 The *4ESS* switch keeps a count of the number of crankbacks that are received when attempting to route calls using stored Via information, and combines this information with information about TCAP timeouts, to determine when to disable use of the stored Via information.

1.10 A count is made of the number of crankbacks that occur using the same stored Via information for each OAS/TAS/RPI combination. The corresponding crankback counter will be reset to zero when this information is updated. The count can be in the range of 0 to 127. If the count exceeds this range, the value of 127 is maintained until it is reset.

1.11 For each OAS/TAS combination, a count is made of the number of TCAP queries that timed-out. Whenever a TCAP query for an OAS/TAS combination results in a response rather than a timeout, its timeout counter is reset to zero. The count can be in the range of 0 to 127. If the count exceeds this range, the value of 127 is maintained until it is reset.

1.12 A crankback threshold value of 10 is established for each OAS/TAS/RPI combination, and is used to determine when to disable use of the stored Via information.

1.13 A TCAP timeout threshold value of 10 is established for each OAS/TAS combination, and is used to determine when to disable use of the stored Via information.

1.14 Use of stored Via information is temporarily disabled for the purpose of normal RTNR routing whenever the crankback count and the TCAP query timeout count both exceed their threshold values. (The stored Via information is available for RTNR backout.) If a new Via route is obtained for the OAS/TAS/RPI combination, it will replace the stored Via information and will immediately be placed back into service; its crankback and timeout counters will be reset to zero.

1.15 Every minute, the *4ESS* switch reactivates the stored Vias that were taken out-of-service because of excessive crankbacks and timeouts. This occurs no matter how long they were out-of-service. All crankback and timeout counters are reset to zero at this time.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management

5.01 If a call is cancelled or skipped because it tried to set-up a Via route but was not able to find the required stored Via information, the same Network Management Counts will increment as would normally occur because of a Dynamic-Automatic Congestion Control (D-ACC). As a result, the following events will occur when (1) all direct TSGs to a destination switch are unavailable, (2) a call attempts to route over a Via path with no stored Via information, and (3) a TCAP Bit Map Query response cannot be obtained from the TAS:

5.02 If the call is cancelled (there are no other Split Access/Flexible Egress Routing (SAFER) routes or the call is not a SAFER call), the OAS will:

- Increment its total office D-ACC Cancel count
- Set the OAS/TAS RPI specific Cancel flag
- Generate Final Handling Code 2 (No Circuit Report:SDOCB).

5.03 If the call is skipped (to another SAFER route), the OAS will:

- Increment its total office D-ACC Skip count
- Increment the OAS/TAS RPI specific Skip count
- Set the OAS/TAS RPI specific Skip count.

5.04 The following counts are affected by this feature:

- NM4SKSPTORO—Total office Selective Key Service Protection (SKSP) real time overflow count
- NM4SKSPTOCB—Total office SKSP preferred calls blocked by network management controls
- NM4EDDOCCAN—Office wide count of calls cancelled by Dynamic Overload Control (DOC)
- NM4NETORCSK—Total office count of SAFER calls skipped by RTNR node-to-node cancel control
- NM4EDDOCSK—Office wide count of calls with Selective Key option from DOC.

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS* switches in the network to be running the 4E22 Release 1 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)

Call Detail Recording Platform (CDRP) and Multiple *4ESS*™ Switch Streams Interface Feature (4464)

7

Contents **Page**

Call Detail Recording Platform (CDRP) and Multiple *4ESS*™ Switch Streams Interface Feature (4464)

7

1. Feature Description

1.01 This feature replaces the Small Computer System Interface (SCSI) Nodes (SINs), which provide an interface between the 3B Processor and the Call Detail Recording Platform (CDRP), with Ethernet Interface Nodes (EINs). This will allow the CDRP to support multiple *4ESS*™ switches.

Background

1.02 Prior to the introduction of the CDRP, the 1A Processor and the D-Channel node sent Call Detail Recording (CDR) events to the 3B Processor whenever a recordable call processing event occurred. The 3B Processor consolidated all of the events for each call and, when the call was disconnected, built a CDR record using a standard format.

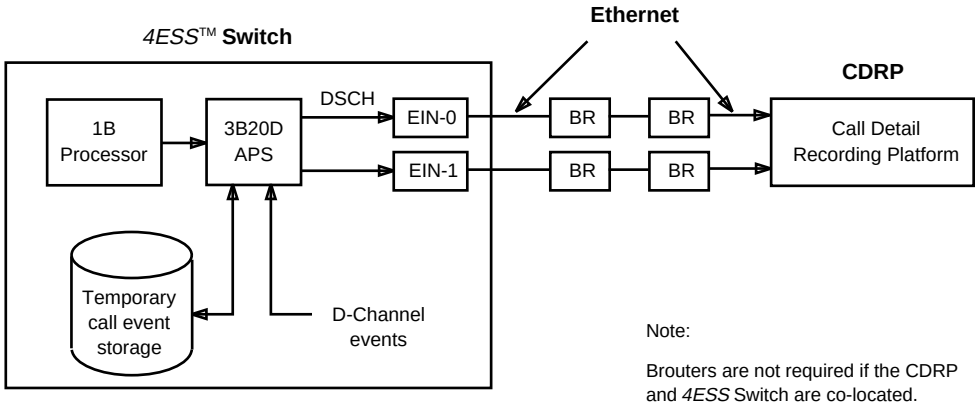
1.03 With the introduction of the 1B Processor in the 4E19 Release 1 Generic, the *4ESS* switch was able to process 1 million calls-per-hour, but the 3B Processor needed more real time to record the calls. As a result, 3B Processor recording functionality was moved to the CDRP .

1.04 The interface to the CDRP is a Common Network Interface (CNI) node referred to as the SIN. The SIN receives the CDR events from the 3B Processor via the Dual Serial Channel (DSCH) and sends them to the CDRP via a SCSI link. Two SINs and two SCSI links (active and standby) were used for reliability.

New Capabilities

1.05 This feature replaces the SINs with EINs, as shown in Figure 7-1. The EINs perform a gateway function, similar to the function performed by the SINs, between the 3B Processor and the CDRP. The EINs convert the 3B Processor Dual Serial Channel (DSCH) to an industry standard Ethernet interface to the CDRP. Unlike the SINs, the EINs allow the CDRP to support multiple (co-located or remote) *4ESS* switches.

NOTE:
Although this feature replaces SINs with EINs, the *4ESS* switch will continue to support SINs. However, an office must have either SINs or EINs, as this feature will not support a mix of both in the same office.



Legend:

APS	Attached Processor System
BR	Brouter
CDRP	Call Detail Recording Platform
DSCH	Dual Serial Channel Interface
EIN	Ethernet Interface Node

tpa 851069/01

Figure 7-1. *4ESS* Switch - CDRP Ethernet Interface

1.06 Additional information about this feature is contained in the following publications:

- 234-153-055AC, *4ESS*™ Switch, CNI-Growth/Degrowth, Task Oriented Practice (TOP)
- 234-151-120, *4ESS*™ Switch, Common Network Interface, Task Oriented Practice (TOP)
- 234-351-002, *4ESS*™ Switch, Maintenance Operations Center, Task Oriented Practice (TOP)

2. Call Flow (Not Affected)

3. Provisioning

3.01 The following procedure should be followed to provision an office with EINs.

1. The CDRP must be running the correct generic software, and it must be loaded first. The CDRP generic must correspond with the generic running on the *4ESS* switch. For 4E21 Release 4, the CDRP generic is G3R4.
2. Perform the EIN installation procedure described in 234-153-055AC. In existing offices, this involves replacing SINs with EINs. In new offices, this involves installing EINs.
3. After the deployment of 4E21 Release 4 software, the default values in the 3B Processor Recent Change Parameter Table will be as listed in Table 7-A. To activate the EINs, the Recent Change Parameter Table must be populated with valid entries, which will vary with each office.
4. The craft command SET:AMA;RC is used to enter the valid entries, and OP:AMA;RC is used to dump the Recent Change Parameter Table for verification.

Table 7-A. Recent Change Parameter Table Default Values

Parameter	Default Value
EIN IP_0 address	0
EIN IP_1 address	0
CDRP_0 IP_0 address	0
CDRP_0 IP_1 address	0
CDRP_0 ID	0
CDRP_0 Password	0
CDRP_1 IP_0 address	0
CDRP_ 1 IP_1 address	0
CDRP_1 ID	0
CDRP_ 1 Password	0
Switch ID	0
Switch Password	0
Compression flag	OFF
Default Brouter IP0	0
Default Brouter IP1	0
Subnet mask	ffffff00

4. Recording

4.01 Recording is not affected by this feature. However, the EIN replaces the SIN as the means by which the *4ESS* switch connects to CDRP for the purpose of transmitting call-event data.

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

Measurements

6.01 The measurement counts listed in Table 7-B were renamed to support this feature.

Table 7-B. Renamed Measurement Counts

Previous Name	New Name
SIN CDR Event Peg Count	IN CDR Event Peg Count
SIN Invalid Length Count	IN Invalid Length Count

6.02 The *4ESS* switch will collect the following peg counts from each of the two EINs in the office as part of the normal measurements collection process (for CNI nodes) performed every 5 minutes:

- Ethernet receive errors (per node)
- Ethernet transmit errors (per node)
- TCP-level retransmit (per node)
- ICMP messages sent (per node)
- ICMP messages received (per node).

6.03 The peg counts listed above are included with the per-office and the per-link *4ESS* switch raw measurements that are made available to the Data Acquisition Reports and Integrated Communications System (DARICS) via the Total Data Administration System (TDAS) file. These measurements are taken every 5 minutes and the TDAS file reports are updated every 15 minutes.

7. Transition Considerations

Turn On/Turn Off Mechanism

NOTE:
The CDRP must be running the correct generic, and it must be loaded first. For 4E21 Release 4, the corresponding generic for the CDRP is G3R4.

7.01 This feature is turned on automatically with software deployment, but only after the procedure described in Provisioning in this chapter is completed.

Ubiquity

7.02 It is not necessary for all *4ESS* switches in the network to be running the 4E22 Release 1 Generic for this feature to be fully operational. However, the CDRP must be running the correct generic. Refer to the Note above.

8. Input/Output Manual Pages

New Input Manual Pages

8.01 The following new input messages were created to support this feature:

- OP:AMA-RC
- SET:AMA-RC
- START:PING.

The following new output messages were created to support this feature:

- REPT:RECENT-CHANG
- REPT:START-PING.

Modified Output Manual Pages

8.02 Because this feature will support both SIN and EIN, the previous references to SIN in a number of messages were changed to IN (Interface Node). This allows the reference to apply to either node.

8.03 The following output messages were modified to support this feature:

- REPT:AMA-FORM
- REPT:AMA-MON.

Direct Link Node Integrated Ring Node 2 Upgrade Feature (4694)

8

Contents **Page**

Direct Link Node Integrated Ring Node 2 Upgrade Feature (4694)

8

1. Feature Description

1.01 This is a hardware feature that upgrades the Direct Link Node (DLN) Node Processor (NP) from an Integrated Ring Node (IRN) with an Intel 80186 processor to an IRN2 with an Intel 80386 processor.

1.02 The DLN is a node on the Common Network Interface (CNI), which interfaces with the Common Channel Signaling 7 (CCS7) network. The DLN provides signaling message processing functions to allow the *4ESS*™ switch 1B Processor to access the CCS7 network.

1.03 The upgrade provided by this feature will:

- Increase the CCS7/Q.931 message-handling capacity to 1800 messages/second in each direction, per DLN
- Increase the amount of usable memory to allow more efficient message/data exchange between the DLN-NP and the DLN-Attached Processor (AP)
- Increase the DLN capacity to meet the expected increase in busy-hour call volume.

1.04 The hardware provided by this feature consists of the following components:

- An IRN2 board (UN304) which contains the DLN-NP and ring interfaces
- A DLN-AP (TN1630 board which contains a DLN-AP30 (Motorola 68030 processor)

- A 3B20D Interface (3BI) board (TN914)
- A Duplex Dual Serial Bus Selector Board (TN69B).

1.05 The IRN2 board fits into the existing slot that was previously used by the IRN. Refer to the *4ESS*™ Switch *CNI Growth/Degrowth Task Oriented Practice* 234-153-055AC for additional information.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS* switches in the network to be running the 4E22 Release 1 Generic for this feature to be operational.

Turn On/Turn Off Mechanism

7.02 Refer to 234-153-055AC for the procedures used to turn this feature on. The procedures include installing the IRN2 hardware and updating the Equipment Configuration Database (ECD).

8. Input/Output Manual Pages (Not Affected)

International Switching Center (ISC) Composite Enhancement Feature (4760a)

9

Contents **Page**

International Switching Center (ISC) Composite Enhancement Feature (4760a)

9

1. Feature Description

1.01 This feature provides two enhancements to the original International Switching Center (ISC) Composite Enhancement Feature (4760), which was introduced in 4E21 Release 2. In addition, this feature removes the Continuity OK Test (COT) on Integrated Services Digital Network-User Part (ISUP) Circuits for Final Handling Code 1877 Feature (4603), which is no longer required.

1.02 Feature 4760 provided two capabilities. First, it fully extended the handling of a Carrier Group Failure (CGF) to each of the 30 circuits that belong to an E1 carrier group. Second, it eliminated the unnecessary sending of Consultative Committee for International Telephone and Telegraphy (CCITT) No.7 blocking/unblocking signaling sequences after the presence/absence of a CGF had been detected. Refer to the *4ESS™ Switch* Product Release Document (234-090-212AC) for additional information on Feature 4760.

1.03 This feature adds two new fields (E1T1 and SUPBLK) to a number of 100-series Recent Change (RC) forms. The new fields replace the use of spare fields S9 and S10, which were used by Feature 4760. The data populated in the E1T1 and SUPBLK fields will be sent to the Data Acquisition Reports and Integrated Communications System (DARICS). Refer to the Provisioning Section in this chapter for additional information.

2. Call Flow (Not Affected)

3. Provisioning

Setting Trunk Subgroups

CAUTION:
The TSG settings described below should be set only when the Advanced Switchable Signaling and Echo Canceling Terminal (ASSET) frame translates international E1 carrier groups into T1 carrier groups which terminate on the 4ESS ISC switch. Setting these characteristics in a purely domestic environment must be avoided at all times.

3.01 This feature adds two new fields, E1T1 and SUPBLK to the RC forms listed below. The new fields replace the use of the spare S9 and S10 fields required by Feature 4760. This allows the data that is populated in E1T1 and SUPBLK to be sent to the DARICS.

3.02 The appropriate trunk subgroup (TSG) characteristics must be set (using the RC forms described below) to make this feature effective for CGFs on TSGs involving E1 carrier groups and for suppression of blocking/unblocking sequences on TSGs involving international E1 and T1 carrier groups for which the Correspondent's switch is able to detect CGFs.

3.03 The new E1T1 and SUPBLK fields on the following RC forms are used, as appropriate, to indicate if the TSG circuits belong to an international T1 or E1 carrier group, and whether the blocking sequence is allowed to be suppressed on the international circuits:

- RC Form 100—Establish a new 2-way TSG
- RC Form 101—Establish a new 1-way incoming TSG
- RC Form 102—Establish a new 1-way outgoing TSG
- RC Form 107—Change a 2-way TSG
- RC Form 108—Change a 1-way incoming TSG
- RC Form 109—Change a 1-way outgoing TSG.

3.04 The rules for populating the E1T1 and SUPBLK fields on each of the RC forms listed above are as follows:

- Y = E1
- E1T1—Indicates whether the circuits are international T1 or E1. Valid entries are Blank or N = T1 carrier group. Default is N.
- SUPBLK—Indicates whether the blocking sequence is allowed to be suppressed on international circuits (either E1 or T1). Valid entries are Blank or N = Suppression of blocking sequence is not allowed. Y = Suppression of the blocking sequence is allowed. Default is N.

Recent Change Form 809

NOTE:
If Feature 4760 was activated using RC 809, it is not necessary to use RC 809 again to activate this feature. The following information applies only to the first-time activation and use of Feature 4760.

3.05 RC Form 809 is used to activate/deactivate Features 4760 and 4760a by populating the FEATURE ITEM field with PF19 and setting the ON OR OFF field to either ON or OFF. To activate the features, set the ON OR OFF field to ON. To deactivate the features, set the ON OR OFF field to OFF. The default is OFF.

3.06 Verify Forms 8j and 16 az are associated with the ON OR OFF entries on RC 809.

4. Recording (Not Affected)

5. Network Management

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS* switches in the network to be running the 4E22 Release 1 Generic for this feature to be operational.

Turn On/Turn Off Mechanism

7.02 There are two procedures that must be followed to activate this feature. Both are described in the Provisioning section of this chapter (including an important caution).

7.03 In the first procedure, the E1T1 and SUPBLK fields on the appropriate 100-series RC forms must be populated to set the TSGs. Then, if this is a first-time activation of Feature 4760, the FEATURE ITEM field on RC Form 809 must be populated with PF19 and the ON OR OFF field set to ON.

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

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

- Structure: OD4OFCCOPY (6732165)
- Core address in the structure for OD4PF19: 4E22 Generic 6732167
- Item/State: OD4PF19
- Word: 2
- Size: 1
- Displacement: 18
- On: 1
- Off: 0.

8. Input/Output Manual Pages

8.01 The **VER:TSG** output manual page was modified to support this feature.

End-to-End Class-of-Service (ECOS) Areas Increase Feature (4776)

10

Contents **Page**

Contents **Page**

End-to-End Class-of-Service (ECOS) Areas Increase Feature (4776)

10

1. Feature Description

1.01 This feature provides two enhancements to the End-to-End Class-of-Service (ECOS) and ECOS/Automatic Provisioning (ECOS/AP) Features 3142/4018, which were introduced in the 4E20 Release 1 Generic. The enhancements provided by this feature are as follows:

- The maximum number of ECOS AREAS for each *4ESS*™ switch is increased from 127 to 255. As a consequence, the maximum number of AREA/ECOS Routing Pattern Identity (ERPI) combinations for each *4ESS* switch is increased from 4,095 to 8,191.
- The maximum number of ECOS AREAS which may be provisioned in a switch is now an engineerable quantity.

1.02 The End-to-End Class-of-Service (ECOS) Feature 3142 extends the concepts of the Class-of-Service/Real Time Network Routing (COS/RTNR) feature to the egress/ingress portion of the network (where AT&T switches connect to overseas switches). Another feature, the ECOS/Automatic Provisioning (ECOS/AP) Feature 4018 enables the *4ESS*™ switch to automatically provision many routing data elements and makes use of existing provisioning capabilities. Since these two features, ECOS and ECOS/AP, are closely related, they are collectively referred to as the ECOS feature.

1.03 ECOS routing is based on the AREA and ERPI parameters, which are increased by this feature. Refer to the *4ESS*™ Switch Product Release Document for 4E20 Release 1 Generic 234-090-221AC, for a description of these parameters and detailed information about the ECOS feature.

2. Call Flow (Not Affected)

3. Provisioning

Office Data Assembler (ODA) Form 406C

3.01 A new field, MAXAREA, was added to Office Data Assembler (ODA) Form 406C to support this feature. The population rules are as follows:

- The allowed values for MAXAREA are blank and 1-255. If blank is entered, then no ECOS AREA may be provisioned.
- The entry must be blank if MAXERPI is 0 or blank.
- MAXAREA must be non-zero if MAXERPI is non-zero.
- MAXAREA must be blank for non-AT&T offices.

3.02 The entries for the MAXAROUT (Maximum number of ECOS Alternate Routes Allowed) and the MAXOROUT (Maximum Number of ECOS Overflow Routes Allowed) fields have been modified to support this feature, as follows:

- The valid entries for MAXAROUT are blank and 1-16384
- The valid entries for MAXOROUT are blank and 1-32768

Recent Change Forms 100, 102, 107, 109

3.03 Recent Change (RC) Forms 100, 102, 107 and 109 now support up to 255 FEAREAs. The layout of the forms is unchanged.

Recent Change Form 526

3.04 RC Form 526 now supports up to 255 AREAs and VIAs. The layout of the form is unchanged.

Recent Change Form 527

3.05 RC Form 527 now supports up to 255 AREAs. The layout of the form is unchanged.

Verify Forms 1a, 1c

3.06 The VER:TSG retrieves the FEAREA/FESWID data. The layout of this form is unchanged.

Verify Form 11d

3.07 The VER:TSGLIST retrieves the FEAREA/FESWID data. The inputs to this message are unchanged.

Verify Forms 5o, 5p

3.08 These forms now support up to 255 AREAs and VIAs.

Verify Form 5q

3.09 This form now supports up to 255 AREAS.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS* switches in the network to be running the 4E22 Release 1 Generic for this feature to be operational.

Turn On/Turn Off Mechanism

7.02 This feature is turned on automatically with software deployment.

8. Input/Output Manual Pages (Not Affected)

CDRI Communications Web—CDRI Application Requirements for the STF Feature (4800)

11

Contents **Page**

CDRI Communications Web—CDRI Application Requirements for the STF Feature (4800)

11

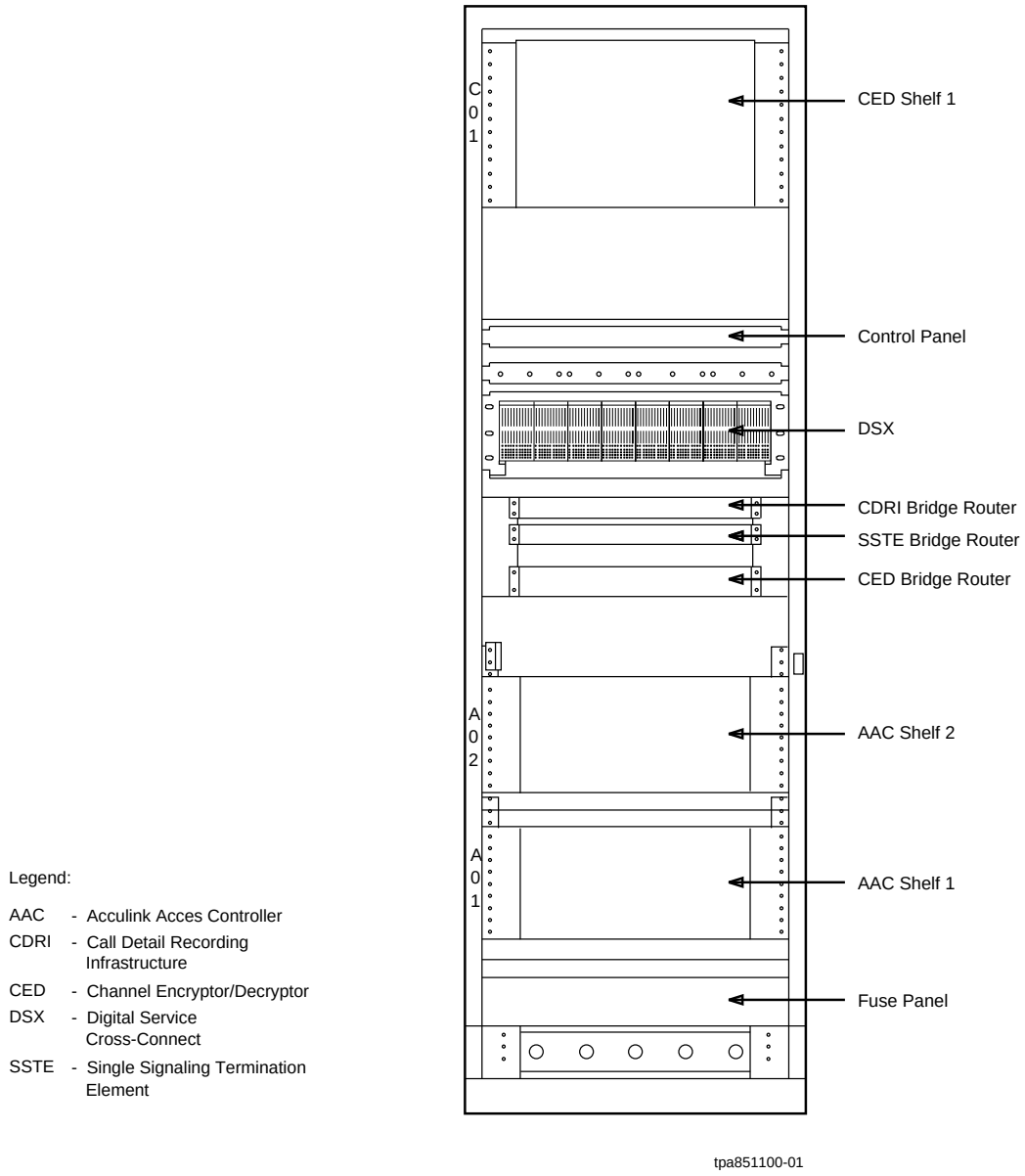
1. Feature Description

1.01 This feature builds on the capabilities provided by the Signaling Transport Standardization Feature (4903), which was introduced in 4E21 Release 3, and the Call Detail Recording Platform (CDRP) and Multiple *4ESS*™ Switch Streams Interface Feature (4464), which is included in 4E22 Release 1.

1.02 Feature 4903 provides the standard footprint design for a number of new signaling transport elements by updating the standard application drawings for the *4ESS* switch. This allows the signaling transport equipment to be included in a new frame, the Signaling Transport Frame (STF), which is placed in a standard location per technology footprint. This is the first time that signaling transport facilities are included as part of the *4ESS* switch footprint. A typical STF is shown in Figure 11-1.

1.03 Feature 4464 replaces the Small Computer System Interface (SCSI) Nodes (SINs), which were used to provide an interface between the 3B Processor and the Call Detail Recording Platform (CDRP), with Ethernet Interface Nodes (EINs). This allows the CDRP to support multiple *4ESS*™ switches.

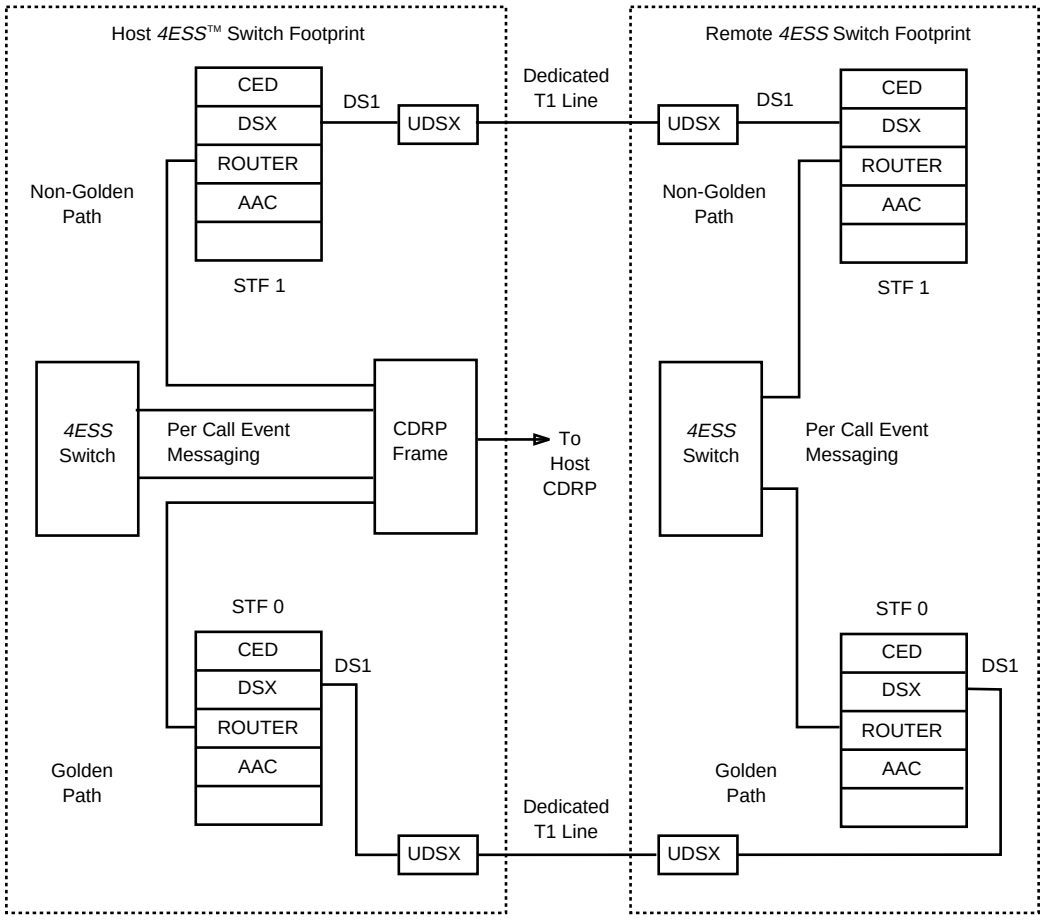
1.04 The EINs receive real-time call event data from the 3B Processor and convert the CDR data stream (also referred to as the CDR payload) to 10BASE-T Ethernet protocol for Local Area Network (LAN) operation. The EINs provide TCP/IP messaging and logical session control capabilities, and the 10BASE-T LAN cable can be bridged or routed using a bridge router to another location using T1 transmission capabilities (NxDS0 or DS1). In this way, a remote *4ESS* switch can be connected to a host CDRP at another location.



Legend:

AAC	-	Acculink Acces Controller
CDRI	-	Call Detail Recording Infrastructure
CED	-	Channel Encryptor/Decryptor
DSX	-	Digital Service Cross-Connect
SSTE	-	Single Signaling Termination Element

Figure 11-1. Typical Signaling Transport Frame (STF)



Legend:

AAC - Acculink Access Controller
CDRP - Call Detail Reporting Platform
CED - Channel Encryptor/Decryptor
DSX - Digital Service Cross-Connect
STF - Standard Transport Frame
UDSX - Universal Digital Service Cross-Connect

Figure 11-2. STF/CDRP Remote-Host Application

1.05 At the CDRP end, the two 10BASE-T LANs from the host *4ESS* switch, and either one other co-located or remote *4ESS* switch is merged at the CDRP Hub, for access to the Ethernet interface of the CDRP. Refer to Figure 11-2. For additional information, refer to the chapter on Feature 4464 in this document.

1.06 This feature affects the Call Detail Reporting Infrastructure (CDRI) terminal equipment at remote *4ESS* switches and at host *4ESS* switch/CDRP locations. It provides the following new capabilities:

- Assigns the ports on the Acculink Access Controller (AAC) located in the STF.
- Provides the CDRI Payload Bridge Router.
- Provides a DS1 data link from the remote *4ESS* switch to the non-remote *4ESS* switch for CDRP data (as shown in Figure 11-2).

CDRI Payload Bridge Router

1.07 The CDRI Payload Bridge Router provided by this feature converts a 10BASE-T TCP/IP Ethernet LAN data stream to a Wide Area Network (WAN) interface. It provides a termination port for the 10BASE-T cable, and routes the data stream to a WAN output port, based on available output bandwidth and the address information received in the message headers of the input data stream. The WAN signal format is fractional T1, and the router is set to 24 X 64 kbps to enable the full T1 bandwidth to be used for the CDRI payload.

AAC Channel Service Unit

1.08 This feature assigns the ports on the AAC, which provides Channel Service Unit functionality for T1 terminations. Local input to the AAC is unchannelized Nx56 kbps or Nx64 kbps (where N is any preset value from 1 to 24). For Common Channel Signaling No. 7 (CCS7) 56-kbps applications, 1x56 kbps is used.

NOTE:
When N=24, the local input is not a standard DS1 line signal (AMI or B8ZS line code, and D4 or ESF line format).

1.09 The AAC Channel Service Unit converts Nx56-kbps or Nx64-kbps data streams (either RS-530 or V.35) into standard DS1, and vice-versa. The DS1 interface of the AAC provides 24 channels, with the framing bit (193 bits/frame) and the facility clock synchronization Data Terminal Equipment (DTE), which connects to a T1 facility termination acting as Data Communication Equipment (DCE).

Channel Encryption/Decryption

1.10 This feature, together with Feature 4748, places encryption devices in the Channel Encryptor/Decryptor (CED) shelf of the STF, and wires it to the Digital Cross-Connect (DSX). The encryption equipment is used to secure the High-Speed Links by encrypting the links at the Digital Services Interface (DSI) facility level.

NOTE:
The availability of the encryption devices may occur later than in the 4E21 Release 4 Generic.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations (Not Affected)

8. Input/Output Manual Pages (Not Affected)

Served Numbering Plan Area Expansion and Home Numbering Plan Area Improvements Feature (4839)

12

Contents **Page**

Contents **Page**

Contents **Page**

Served Numbering Plan Area Expansion and Home Numbering Plan Area Improvements Feature (4839)

12

1. Description

1.01 The Served Numbering Plan Area (SNPA) Expansion and Home Numbering Plan Area (HNPA) Improvements feature provides more capacity for switches to handle new Numbering Plan Areas (NPAs) and makes the provisioning of NPA splits easier. This feature provides the following improvements:

- The number of domains in the switch is doubled.
- The HNPA is mapped to SNPA routing.
- A geographic location identifier is defined.
- Increases the number of NPAs a switch can serve to 31.
- Increases the NPAs in the Automatic Number Identification (ANI) and Destination Number (DN) trigger tables to 31.
- Increases the Dialed Number Service Type (DNST) values to 64.

NOTE:
There are no HNPAs in the AT&T Switch Network (ASN) as of the 4E22 Release 1 Generic.

Feature Dependencies

1.02 The dependencies relating to this feature are as follows:

- Feature Number 4866 for 4E21 Release 3 Generic has been deployed. (This feature disables the Dynamic Non-Hierarchical Routing (DNHR)/Real Time Network Routing (RTNR) delete algorithm based on Far-End Numbering Plan Area (FENPA) so that 7-digit intertoll calls are no longer received by the switch.)
- AT&T has removed any Routing Data Block (RDB) provisioning which deletes the HNPA of a call before routing an intertoll call.
- AT&T switches are not using Centralized Automatic Message Accounting (CAMA) screening. (CAMA translators have special rules for populating the HNPA and with the deployment of this feature, the HNPA no longer exists in AT&T switches.)
- ALLIANCE® Teleconferencing Services Network Services CompleX (NSCX) does not strip the NPA of the call before processing.
- AT&T has set any code not to be mapped over to SNPA routing to Universal Treatment Code (UTC) in 4E21 Release 4 Generic.

Plain Old Telephone Service (POTS) Subdomain Changes

1.03 With the exception of UTC, all previous Home NPA routings are converted to SNPA routings. The following POTS subdomains support 10-digit SNPA routing:

- Intertoll
- Area code
- 31 Served NPAs
- Non-area codes for SNPAs
- The NPA switch geographic location is identified in the OD4HOMENPA structure and prints in the HNPA field of the VER:MEMORY:EM message.

2. Call Flow

2.01 Modifications to call flow are as follows:

- The *4ESS*™ switch routes international inbound calls through structure OD4INTLINB. This structure is populated by NG-ODA to point to the POTS intertoll subdomain.
- Calls that are retranslated to POTS subdomain are routed through the domain specified in OD4HOMENPA structure.
- Any Trunk Subgroup (TSG) that previously had an HNPA is now routed to an SNPA and treated as a typical SNPA routing.

Call Type Treatments for Offices Using 10-Digit SNPA Routing

Tables 12-A through 12-D summarize valid routing treatments in the POTS subdomains. Population rules have only changed to reflect the absence of a Home NPA.

2.02 Table 12-A summarizes valid call type treatments for 10-digit SNPA routing across POTS subdomain.

Table 12-A. Typical Routing

AC	ITOLL	SNPA	SNPANAC	DESCRIPTION
VAC	VAC	PFX(SNPA)	PFX(SNPA)	The code is not assigned as an Area Code or Office Code in the Served NPA
VAC	VAC	PFX(SNPA)	PFX(SNPA)	The code is assigned as an office code in the Served NPA
AC	AC	AC	PFX(SNPA)	The code is assigned as an area code
AC	AC	IND	PFX(SNPA)	The code is assigned as an area code and an office code in the Served NPA

2.03 Table 12-B describes a typical routing situation, but the code is marked UTC. A code marked UTC cannot be made an area code. Also, PLU calltypes and the SNPA codes cannot be made UTC.

Table 12-B. 10-Digit SNPA Routing With UTC

AC	ITOLL	SNPA	SNPANAC	DESCRIPTION
VAC	VAC	VAC	VAC	The code is not assigned as an Area Code or Office Code in the Served NPA
VAC	OFC	OFC	OFC	The UTC code is assigned as an office code across all domains except for the Area Code Domain.
n/a	n/a	n/a	n/a	All other cases

2.04 Table 12-C describes valid call type treatments when the code is SNPA.

Table 12-C. Code Is SNPA

AC	ITOLL	SNPA	SNPANAC	DESCRIPTION
n/a	n/a	n/a	n/a	The SNPA code is not assigned as an Area Code or Office Code in the Served NPA
SD3	SD3	SD3	PFX(SNPA)	The SNPA code is assigned as an area code
SD3	SD3	IND	PFX(SNPA)	The SNPA code is assigned as an office code in the Served NPA.

2.05 Table 12-D describes valid call type treatments for protected codes in the POTS subdomain. Protected codes are defined using Recent Change (RC) Form 308. The Originating Numbering Plan Area (ONPA)-Terminating Office Code (TOFC) must be vacant. The Terminating Numbering Plan Area (TNPA)-TOFC must be an office code. TNPA must be an area code. The ONPA must be a Service NPA. The TNPA can be any NPA (6-digit routed, including another SNPA).

Table 12-D. Protected Codes (Treatment for the TOFC Code)

AC	ITOLL	SNPA	SNPANAC	ONPA	TNPA	TOFC	TOFC CODE
SD3	SD3	IND	PFX(TNPA)	SNPA	TNPA	SNPA	The Terminating office code (SNPA code) is defined as an area code and office code only in the Terminating NPA (not SNPA)
VAC	VAC	PFX(TNPA)	PFX(TNPA)	SNPA	TNPA	OFC	The Terminating office code (not SNPA code) is defined as an office code in the Terminating NPA (not SNPA)
SD3	SD3	IND	PFX(TNPA)	SNPA	TNPA	OFC	The Terminating office code (not SNPA code) is defined as an area code and office code in the Terminating NPA (not SNPA)
n/a	n/a	n/a	n/a	all other cases			

The following tables show the difference between 4E21 Release and 4E22 Release for International Routing Action (IRA).

2.06 Table 12-E describes a POTS with AC=N and UTC not marked.

Table 12-E. Office Code and SNPA Routing Treatments Non-UTC

4E21 Generic Office Code Treatment			**4E22 Generic SNPA Routing Treatment**		
Call Type	Call Data	AD1	Call Type	Call Data	AD1
IRA	EASXP EASIN TRD81 TRDIN RTRIN D2RIN EASDNA D3RDOM	Don't Care	FHT	VCA	Blank
IRA	RTRDOM	HNPA	IRA	DTRDOM	IT
		Not HNPA	IRA	RTRDOM	No Change

2.07 Table 12-F describes treatment for POTS when AC=N and the code is UTC, area codes, and non-POTS codes.

Table 12-F. Office Code and SNPA Routing Treatments With UTC

4E21 Generic Office Code Treatment			4E22 Generic SNPA Routing Treatment		
Call Type	Call Data	AD1	Call Type	Call Data	AD1
IRA	EASXP EASIN TRD81 TRDIN	N/A	IRA	No Change	N/A
IRA	RTRIN D2RIN EASDNA	Not HNPA	IRA	No Change	No Change
	D3RDOM RTRDOM	HNPA	IRA	No Change	No Change

3. Provisioning

Office Data Administration (ODA) Retrofit Rules

3.01 The retrofit rules for transferring translations from old HNPAs to new SNPAs (formed from the old HNPA) apply only to non-UTC POTS where AC = N. Any code groups containing Routine Data Block Index (RDBI) with call types Routing Data Block (RDB), Go/No go Screening (GNS), Emergency Alternate Routing (EAR), Meet-Me Teleconferencing (MMT), and Robust Non-Hierarchical Routing (RNR) are changed.

3.02 Two examples of RDB conversion rules are as follows:

- The HNPA is removed from the prefix digits and kept current delete, if the first 3 prefix digits equal the HNPA with no following digits. This situation is included in the following example:

  old DEL=0 PREFIX=HNPA new DEL=3 PREFIX=blanks
  old DEL=3 PREFIX=HNPA new DEL=3 PREFIX=blanks

- Otherwise, the HNPA is removed, keep the current prefix and add 3 to the delete.

  old DEL=0 PREFIX=blanks new DEL=3 PREFIX=blanks
  old DEL=2 PREFIX=HNPAXX new DEL=5 PREFIX=XX
  old DEL=4 PREFIX=XXXX new DEL=7 PREFIX=XXXX

3.03 For call types Proportional Routing (PRT), Multiple Routing Treatment (MRT), Multiple Carrier Treatment (MCT), or manual Subsequent Digit Index (SDX), the contents of the data blocks is searched for call types with RDBIs. If another non-AC=N uses these call types, a duplicate of the RDB and call type blocks occurs. The duplicate RDB start at index 4000 and call type blocks start at index 1. An RDB subject to modification is changed only if the RDB is used exclusively in POTS AC=N; otherwise a duplicate is created.

Structures Affected

A. HT43DIG

3.04 The structure HT43DIG is doubled to support the increased number of SNPAs in the POTS subdomain. The POTS subdomains locations of 1 through 19 in HT43DIG are moved to locations 191 and greater and the order of the subdomains is reorganized.

NOTE:
With the changes to this structure, the procedures for NPA splits must be modified.

Table 12-G explains the reorganization of the POTS subdomains.

Table 12-G. HT43DIG Compool Changes

OLD VALUE	NEW VALUE	DESCRIPTION
1		Deleted
2		Deleted
3	191	POTS-AREA CODE
4	192	POTS INTERTOLL
5	193	POTS INTERTOLL-NON AREA CODE (Always unassigned)
6	194	POTS SERVED NPA1
7	195	POTS SERVED NPA1-NON AREA CODE
8	196	POTS SERVED NPA2
9	197	POTS SERVED NPA2-NON AREA CODE
10	198	POTS SERVED NPA3
11	199	POTS SERVED NPA3-NON AREA CODE
12	200	POTS SERVED NPA4
13	201	POTS SERVED NPA4-NON AREA CODE
14	202	POTS SERVED NPA5
15	203	POTS SERVED NPA5-NON AREA CODE
16	204	POTS SERVED NPA 6
17	205	POTS SERVED NPA6-NON AREA CODE
18	206	POTS SERVED NPA7
19	207	POTS SERVED NPA7-NON AREA CODE
	208	POTS SERVED NPA8
	209	POTS SERVED NPA8-NON AREA CODE
	210	POTS SERVED NPA9

Table 12-G. HT43DIG Compool Changes (Contd.)

OLD VALUE	NEW VALUE	DESCRIPTION
	211	POTS SERVED NPA9-NON AREA CODE
	212	POTS SERVED NPA10
	213	POTS SERVED NPA10-NON AREA CODE
	214	POTS SERVED NPA11
	215	POTS SERVED NPA11-NON AREA CODE
	216	POTS SERVED NPA12
	217	POTS SERVED NPA12-NON AREA CODE
	218	POTS SERVED NPA13
	219	POTS SERVED NPA13-NON AREA CODE
	220	POTS SERVED NPA14
	221	POTS SERVED NPA14-NON AREA CODE
	222	POTS SERVED NPA15
	223	POTS SERVED NPA15-NON AREA CODE
	224	POTS SERVED NPA 16
	225	POTS SERVED NPA16-NON AREA CODE
	226	POTS SERVED NPA17
	227	POTS SERVED NPA17-NON AREA CODE
	228	POTS SERVED NPA18
	229	POTS SERVED NPA18-NON AREA CODE
	230	POTS SERVED NPA19
	231	POTS SERVED NPA19-NON AREA CODE
	232	POTS SERVED NPA20
	233	POTS SERVED NPA20-NON AREA CODE
	234	POTS SERVED NPA21
	235	POTS SERVED NPA21-NON AREA CODE
	236	POTS SERVED NPA22
	237	POTS SERVED NPA22-NON AREA CODE
	238	POTS SERVED NPA23
	239	POTS SERVED NPA23-NON AREA CODE
	240	POTS SERVED NPA24
	241	POTS SERVED NPA24-NON AREA CODE
	242	POTS SERVED NPA25
	243	POTS SERVED NPA25-NON AREA CODE
	244	POTS SERVED NPA 26
	245	POTS SERVED NPA26-NON AREA CODE

Table 12-G. HT43DIG Compool Changes (Contd.)

OLD VALUE	NEW VALUE	DESCRIPTION
	246	POTS SERVED NPA27
	247	POTS SERVED NPA27-NON AREA CODE
	248	POTS SERVED NPA28
	249	POTS SERVED NPA28-NON AREA CODES
	250	POTS SERVED NPA29
	251	POTS SERVED NPA29-NON AREA CODES
	252	POTS SERVED NPA30
	253	POTS SERVED NPA30-NON AREA CODES
	254	POTS SERVED NPA31
	255	POTS SERVED NPA31-NON AREA CODES

B. HT4SPREDIG

3.05 The structure HT4SPREDIG increased from 32 to 128 words.

C. HT4PREDIG

3.06 The structure HT4PREDIG increased from 32 to 128 words to support the additional SNPAs. All protected codes are listed in words 32 and greater.

NOTE:
All protected codes are found in the second half of the HT4PREDIG structure.

D. OD4HOMENPA

3.07 This structure points to the switch geographic location identifier. It defines the routing type of the office and the domain and pcode associated with the switch geographic locations identifier. The pcode is the index into HT4PREDIG which contains the NPA of the geographic identifier. The domain is the domain in HT43DIG in which any calls referencing this structure are routed.

E. OD4INTLINB

3.08 This new 1-word structure defines the POTS subdomain where international inbound calls are translated.

RC Forms Affected

A. RC Forms 300-303

3.09 RC Forms 300-303 allow changes to the code group translations. The population rules for these forms are modified for all SNPA 10-digit routing offices with the following:

- AC equals N is only allowed if the ABC digits have been specificed as UTC.
- DNST field has new spares bits DNST24-DNST55 defined.
- CALLTYP field LSI is no longer a valid entry.
- DOM field LSI is no longer a valid entry.

B. RC Form 304

3.10 RC Form 304 creates or changes subsequent digit entries and the population rule is modified to support the new spare bits DNST24-DNST55.

C. RC Form 307

3.11 RC Form 307 adds new service NPAs and is modified to support 31 SNPAs.

D. RC Form 308

3.12 RC Form 308 is used to add or delete protected terminating office codes and is modified to support the increase of protected codes from 24 to 96.

E. RC Form 309

3.13 RC Form 309 allows the addition of new non-POTS domains and the population rule is modified as follows:

- AC equals N is only allowed if the ABC digits have been specified as UTC.

F. RC Form 311

3.14 RC Form 311 changes the number of digits to be translated for a given routing number and the population rules are modified as follows:

- AC equals N is only allowed if the ABC digits have been specified as UTC.
- DOM field LSI is no longer a valid entry.

NOTE:
There is no decrease NTD support for UTC.

G. RC Forms 319 and 320

3.15 RC Forms 319 and 320 allow for the addition and deletion of three digit types and are modified as follows:

- DNHR digit type is replaced by DT17.
- To add UTC treatment, the routing code in the POTS translations must be specified as vacant code.
- To delete UTC treatment, the routing code in the POTS translations must be specified as vacant code.

H. RC Forms 327-330

3.16 RC Forms 327-330 allow changes to DESEPS for digit translations and the population rules are modified as follows:

- AC equals N is only allowed if the ABC digits have been specified as UTC.
- DOM field LSI is no longer a valid entry.

NOTE:
RC Forms 100-102, 107-109, 300-304, 307-309, 311, 319-320, and 327-330 are also modified to support the new POTS subdomain locations.

I. RC Form 346

3.17 RC Form 346 is used to create positive lookup call types and is modified in its layout as follows:

- AC field is deleted.
- DEFG header is deleted.
- GHIJ field must be populated.

NOTE:
The share field is also deleted with this release.

J. RC Forms 627 and 628

3.18 RC Forms 627 and 628 allow for the addition, change or deletion of ANI delivery service data link information and is modified to support additional NPAs.

K. RC Forms 629 and 630

3.19 RC Forms 629 and 630 allow for changes to LATA/state screening areas and matrixs. Both forms are deleted.

L. RC Form 631

3.20 RC Form 631 is used to change service related parameters and is modified as follows:

- LSMTX field is deleted.
- LSFHT field is deleted.
- NUMPL field is deleted.

M. RC Form 639

3.21 RC Form 639 adds or changes the Routing Pattern Identify (RPI), route selection or LATA/state screening information and is modified as follows:

- LSMTX field is deleted.
- LSFHT field is deleted.

N. RC Form 642

3.22 RC Form 642 defines the Service Identity Index (SII) for signaling types and is modified to support the new spare bits defined DNST24-DNST55 spare bits.

Verify Forms Affected

A. Verify Form 11d

3.23 Verify Form 11d is used to verify TSG with one or more of the same specified characteristics. When FDx equals DOM the following additional valid entries are defined for the DTx key word:

- SNPA8-SNPA31
- SNPA8NAC-SNPA31NAC.

The following DTx entries are invalid:

- HNPA
- HNPANAC.

B. Verify Form 13b

3.24 Verify Form 13b is used to verify code group treatment. This form is modified with the following:

- The audits are updated to support additional POTS subdomains and their new locations. Information about these audits has been issued in a Laboratory Design Information (LDI) document, LDI 1489.
- Permissive dialing message is deleted from the output message because all SNPAs have permissive dialing.

C. Verify Forms 3ak and 3al

3.25 Verify Forms 3ak and 3al are used for positive look up digit translations and are modified as follows:

- AC field is deleted.
- DEFG header lines are deleted.

D. Verify Forms 13d and 3h

3.26 Verify Forms 13d and 3h request verification of the 3-digit type translator and are modified to support DT17 plus deletes DIGTYP DNHR from both input and output messages.

E. Verify Forms 13s and 3ai

3.27 Verify Forms 13s and 3ai request verification of domain type information and are modified so the LSI domain type is no longer a valid entry.

NOTE:
Verify Forms 11d, 13b, 3ak, 3al, 13d, 3h, 13s, and 3ai are modified to support the new POTS subdomain locations.

F. Verify Forms 16ai, 6ap

3.28 Verify Forms 16ai and 6ap request verification of TORIG/TDEST/SST/DNST of service identify index and are modified to support the new DNST values DNST24-DNST55.

G. Verify Form 6ag

3.29 Verify Form 6ag verifies service parameters and is modified as follows:

- LSMTX field is deleted.
- LSFHT field is deleted.
- NUMPL field is deleted.
- LSI domain is no longer a valid input.

H. Verify Forms 16y and 6af

3.30 Verify Forms 16ay and 6af request verification of LATA/state screening matrix and VER:LATASTAT;MATRIX! form is deleted.

I. Verify Forms 16x and 6ae

3.31 These forms request verification of LATA/state screening areas and VER:LATASTAT;AREAS! form is deleted.

J. Verify Form 6c

3.32 Verify Form 6c lists used and available switch resources and is modified as follows:

- Outputs up to 31 Served NPAs
- The value identifier in the HNPA field is the geographic switch identifier.

4. Recording (Not Affected)

5. Network Management

5.01 Measurement data that is sent to the Network Management Operations System (NEMOS) is affected by this feature. Several message types are changed because the domain fields changed from 7 bits to 8 bits.

6. Maintenance/Troubleshooting

Changed Final Handling Code (FHC)

6.01 When a 7-digit call received by a switch originating from SNPA (was an HNPA) hits vacant code, the irregularity report (final handling code 62) will show a 10-digit number instead of a 7-digit number.

7. Transition Considerations

Feature Dependencies

7.01 This feature depends on AT&T to set any code not to be mapped over to SNPA routing, to UTC in 4E21 Release 4 Generic time frame.

7.02 This feature depends on a 4E21 Release 3 Generic feature, Routing Data Blocking (RDB) List Verify Tool (4866) being deployed. Feature 4866 disables the DNHR/RTNR so that 7-digit intertoll calls are not received by the switch.

7.03 ALLIANCE® overwrite is applied to all NSCX switches.

Ubiquity

7.04 It is not necessary for all *4ESS* switches in the network to be running the 4E22 Release 1 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 Page

8.01 The following input/output messages are impacted by this feature:

- VER:CODEGRP;OPT(PLU)
- VER:MEMORY;OPT(EM)
- VER:RTNR;OPT(SII)
- VER:SERVICE;OPT(SRVC)
- VER:TSG;OPT(LIST).

Attached Processor Interface (API) Capacity Improvement Feature (5003)

13

Contents **Page**

Attached Processor Interface (API) Capacity Improvement Feature (5003)

13

1. Feature Description

1.01 This feature improves the throughput capacity of the Attached Processor Interface (API) by reducing the impact of Common Channel Signaling System 7 (CCS7) ISDN User Part (ISUP) messages. This results in an improvement in overall *4ESS*™ switch call-handling capacity, and helps to prevent an expected bottleneck in the busy-hour call capacity of the switch.

1.02 The improvement in call-handling capacity provided by this feature results from a reduction in the size of header fields that are used to direct all domestic ISDN User Part (ISUP) messages (interprocessor and intra-office). This feature requires no changes to hardware configurations within the *4ESS* switch.

NOTE:
Feature 4694, Integrated Ring Node 2 Upgrade for the Direct Link Node (DLN), is also being introduced in the 4E22 Release 1 Generic to help prevent CCS7-message bottlenecks in the DLN. Both features have comparable maximum throughput capabilities.

2. Call Flow

Incoming Messages

2.01 The ISUP messages received from the signaling network pass through the DLN, 3B Attached Processor System, and the API before they are received by the 1B

Processor. This feature provides that the DLN will replace the existing header with a 1-word header. There are no changes to functionality or content other than message length.

NOTE:
One word is the minimum length of a header field, since the DLN, 3B Attached Processor System, API, and the 1B Processor are word-oriented devices.

2.02 When this feature is deployed, the reduced header will contain data fields for length (of complete 3-byte/word messages), and for the Trunk Scanner Number (TSN).

2.03 The 1B Processor will restore the message-header layout (using default values for all fields not present in the reduced header), so that it corresponds to the format expected by the existing call-processing routines.

Outgoing Messages

2.04 The 1B Processor will continue to construct ISUP messages to be directed to the CNI ring. However, a message handler will replace the (mostly-empty) header with a 1-word header before it is sent across the API. The DLN will expand the format to provide the layout that is expected by the CNI ring.

Alternate Signaling Transport Networks

2.05 This feature has no impact on Alternate Signaling Transport Networks.

3. Provisioning

Recent Change Form 809

3.01 Recent Change (RC) Form 809 is used to activate/deactivate Feature 5003 by populating the FEATURE ITEM field with F14 and setting the ON OR OFF field to either ON or OFF. To activate the feature, set the ON OR OFF field to ON. To deactivate the feature, set the ON OR OFF field to OFF. The default is OFF.

3.02 Verify Form 8j is associated with the ON OR OFF entries on RC 809.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS* switches in the network to be running the 4E22 Release 1 Generic for this feature to be operational.

Turn On/Turn Off Mechanism

7.02 To activate this feature, the FEATURE ITEM field on RC Form 809 must be populated with F14 and the ON OR OFF field set to ON.

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

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

- Structure: OD4OFCCOPY: 4E22 Generic 6731265
- Core address in the structure for OD4F14: 4E22 Generic 6731266
- Item/State: OD4F14
- Word: 1
- Size: 1
- Displacement: 13
- On: 1
- Off: 0.

8. Input/Output Manual Pages

8.01 The **VER:TSG** output manual page was modified to support this feature.

1B Processor Tape Unit Elimination Feature (5013)

14

Contents **Page**

Contents **Page**

1B Processor Tape Unit Elimination Feature (5013)

14

1. Feature Description

1.01 Before this feature, the 1B Processor Data Unit Selector (DUS) Tape Unit Controller (TUC) provided secondary emergency backups, accessed the Trouble Locating Procedures (TLP) database, performed secondary emergency System Reinitialization (SR), secondary emergency diagnostics, miscellaneous tape generations, and system database administration.

1.02 This feature provides information regarding the elimination of 1B Processor DUS/TUC, which is manufactured discontinued. The functions that resided on the 1B Processor DUS/TUC either moved to the 3B Attached Processor System (APS) or were eliminated in 4E22 Release 1 Generic. Table 14-A explains the transition of functions from the 1B Processor DUS/TUC to the 3B APS.

NOTE:
Prior to 4E22 Release 1 Generic, these functions will still be performed on the 1B Processor DUS/TUC.

1.03 Table 14-A explains the functional replacements for the 1B Processor DUS/TUC.

Table 14-A. 1B DUS/TUC Functional Replacements

1B Tape Unit Functionality	Placement After DUS/TUC Removal
Backup Data (TWRP)	
Generic	3B APS
ODA	3B APS
NWM	3B APS
Traffic & Plant Management	3B APS
Library Programs	3B APS
Tape Generation	
TDAS	3B APS
LTS	3B APS
TOSL	3B APS
ERAP	3B APS
RCLI	Eliminated-No longer used
GULP Copy	Replaced by RUAS
TLP	
TLP Data Base Access	TLP data base has been moved to 3B Disk and access is on 3B APS
1B Emergency Diagnostics	
Tape paged diagnostics	Eliminated - no longer on 1B
1B SR from the 1B Tape Unit	
Generic Access	Eliminated - SR capability on 3B APS is used
ODA Access	Eliminated - SR capability on 3B APS is used
NWM Access	Eliminated - SR capability on 3B APS is used
System Update	
NWM Access	A stand-alone procedure has been developed on 3B APS for NWM to apply software updates other than retrofit.
GULP Access	Replaced by RUAS
Administration of Data	
SAST	3B APS
RC Rollback	3B APS
Library Programs	Library program access functionality is on 3B APS

Legend

APS - Attached Processor System
DUS - Data Unit Selector
ERAP - Error Analysis Program
GULP - Generic Utility Program
LTS - Long Term Storage Tape
NWM - Network Management
ODA - Office Data Assembler
RCLI - Recent Change Library
RUAS - Remote Utility Access System
SAST - System Audit of Stores using Tape
SR - System Reinitialization
TDAS - Traffic Data Administration System Tape
TLP - Trouble Locating Procedures
TOSL - Trunk Out of Service List
TUC - Tape Unit Controller

Screen Appearance

1.04 The current references to DUS/TUC on the Master Control Console (MCC) Pages EAI, 108, 118 and 119 are modified and will remain on these pages until the MCC and Utility Processor (MUP) firmware is changed in future releases.

A. Emergency Action Interface (EAI) Page

The EAI page indicates the source for an SR. When a poke is allowed the 63-NORMAL SR is displayed and data is read from the 3B APS. Table 14-B explains the status.

Table 14-B. EAI Status Indicators

Color	Status	Action
White on Black	Normal	Unselected
Purple on White	Poke accepted	Setup state
Purple on White	SR selected	Reading 3B

If a 63-Normal is not displayed, the colors displayed are not affected by any activity and a poke command will return a No Good (NG) indicator response.

B. MCC Page 108

The MCC Page 108 indicates the status of the DUS/TUC. The status indicators appear as normal after a MUP reset. Once the 1B Processor is running base level, the equipage is used to configure the MUP to display or not display the DUS/TUC.

After the MUP is configured, the MUP allows the pokes to function as normal, if the 1B Processor is equipped with DUS/TUC. If the 1B Processor is not equipped with DUS/TUC, the indicators appear as "834- " and "835- ".

In 4E23 Release and beyond, after a MUP reset, the indicators are lit but non-functional and after the MUP is configured the indicators remain non-functional and appear as "834- " and "835- ".

C. MCC Page 118

The MCC Page 118 indicates the status of the DUSs. The status indicators for DUS 0 and DUS 1 appear and function as normal after a MUP reset. Once the 1B Processor is running base level, the equipage is used to configure the MUP to display or not display the DUSs.

In 4E23 Release and beyond, after a MUP reset, the status indicators are displayed and function normally. After the MUP is configured, the DUS is not displayed.

D. MCC Page 119

The MCC Page 119 provides the ability to set and clear recovery actions and inhibit interrupt options. The 15-multiple tape SR and 19-INH tape error correction functions are displayed and function as normal after a MUP reset. Once the 1B Processor is running base level, the equipage is used to configure the MUP to display or not display the DUS/TUC.

In 4E23 Release and beyond, after a MUP reset, the indicator is displayed and functions normally. After the MUP is configured, these functions are disabled and provide no action.

2. Call Flow (Not Affected)

3. Provisioning

Data Relationships

A. Transitional Considerations

3.01 The interfaces that exist between the 1B Processors and the 3B Processors are explained in the following:

- When the 3B Processor writes a backup tape [Generic (GEN), Office Data Assembler (ODA), Network Management (NWM), Traffic and Plant Management (TPM), Library] the 3B Processor sends a message to the 1B Processor to lock out System Audits of Writable Store (SAWS) programs and Recent Change (RC) activity.
- When an ODA tape is written, the 3B Processor sends a message to the 1B Processor to update the recent change rollback area.
- The 1B Processor TLP program requests the 3B Processor to return data from the appropriate TLP equipment files.
- The 1B Processor System Audit of Stores using Tape (SAST) requests the 3B Processor to read tape blocks from a GEN, ODA, NWM, TPM tape loaded on the 3B tape unit and to deliver them to the 1B Processor.
- The 1B Processor library program requests the 3B Processor to read the library tape loaded on the 3B tape unit and deliver it to the 1B Processor.

Growth and Retrofit

3.02 For additional information see Manual 234-353-010 *4ESS™ Switch 1B Processor Growth/Degrowth*.

4. Recording (Not Affected)

5. Network Management

5.01 Network Management tapes are loaded via the 3B tape unit. All backup tapes are generated by the 3B Processor.

6. Maintenance/Troubleshooting

1B Emergency Requirements

6.01 Emergency Diagnostics and Emergency System Reinitialization for the 1B Processor are done on the 3B Processor.

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS™* switches in the network to be running the 4E22 Release 1 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

7.02 This is a hardware feature; therefore, there is no turn on/turn off mechanism.

8. Input/Output Manual Pages

Input/Output Messages Eliminated

8.01 The following input and output messages are eliminated with the removal of the 1B Processor DUS/TUC:

- ALW:TUC
- SET:TUC
- SAST UPD:GEN UPD:ODA
- 1B Processor Tape-Writing Messages:
  - Generic COPY:GEN
  - ODA COPY:ODA
  - Network Management COPY:NWM
  - Traffic and Plant Management COPY:TPM

Expanded Time Slot Interchange in Input/Output Messages Feature (5111b)

15

Contents **Page**

Expanded Time Slot Interchange in Input/Output Messages Feature (5111b)

15

1. Feature Description

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 second 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*™ 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)

6. Maintenance/Troubleshooting (Not Affected)

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 4E22 Release 1 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 4E22 Release 1 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

7.03 This feature is turned on by software installed in 4E22 Release 1 Generic.

8. Input/Output Manual Pages

8.01 Many messages are affected by the XTSI feature. Table 15-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 15-A. Input and Output Messages Related to XTSI.

(1) **TYessagePE** = 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: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: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			

Table 15-A. Input and Output Messages Related to XTSI (Contd.)

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: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			

Table 15-A. Input and Output Messages Related to XTSI (Contd.)

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	

Table 15-A. Input and Output Messages Related to XTSI (Contd.)

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		
IM	CLR:TSIBP:TSI	xtsi	22R1			X	
IM	COPY:TSI	xtsi	22R1			X	
IM	COPY:TSIFILE:TSI	xtsi	22R1			X	
IM	DUMP:TSIFILE:TSI	xtsi	22R1			X	
IM	DUMP:TSIMEM:TSI	xtsi	22R1			X	
IM	LOAD:TSIFILE:TSI	xtsi	22R1			X	
IM	LOAD:TSIMEM:TSI	xtsi	22R1			X	
IM	OP:SDC	both	22R1			X	
IM	OP:TSIBP:TSI	xtsi	22R1			X	
IM	ORD:DS1LOOP	xtsi	22R1			X	
IM	ORD:DS3LOOP	xtsi	22R1			X	
IM	SET:TSIBP:TSI	xtsi	22R1			X	
IM	UPD:TSI	xtsi	22R1			X	
IM	VER:TRKNAME,TSI,SPS	xtsi	22R1			X	
IM	VER:UTYPE	both	22R1			X	
IM	VER:VFUNC XTSID3U	xtsi	22R1			X	
IM	VER:VFUNC SUXTSI	xtsi	22R1			X	

Table 15-A. Input and Output Messages Related to XTSI (Contd.)

I/O	MESSAGE	TYPE (TSI/XTSI)	GEN. REL.	DEL	NEW MSG	MOD. MSG	FORMAT CHG
IM	RCV form 700	both	22R1			X	
IM	RCV form 701	both	22R1			X	
IM	RCV form 704	xtsi	22R1			X	
IM	RCV form 705	xtsi	22R1			X	
IM	RCV form 706	xtsi	22R1			X	
IM	OP:RCFORM	both	22R1			X	
OM	CLR:TSIBP:TSI	xtsi	22R1			X	
OM	COPY:TSI	xtsi	22R1			X	
OM	COPY:TSIFILE:TSI	xtsi	22R1			X	
OM	DUMP:TSIFILE:TSI	xtsi	22R1			X	
OM	DUMP:TSIMEM:TSI	xtsi	22R1			X	
OM	LOAD:TSIFILE:TSI	xtsi	22R1			X	
OM	LOAD:TSIMEM:TSI	xtsi	22R1			X	
OM	OP:TSIBP:TSI	xtsi	22R1			X	
OM	ORD:DS1LOOP	xtsi	22R1			X	
OM	ORD:DS3LOOP	xtsi	22R1			X	
OM	REPT:TSIBP	xtsi	22R1			X	
OM	SET:TSIBP:TSI	xtsi	22R1			X	
OM	UPD:TSI	xtsi	22R1			X	
OM	VER:MISC-SUXTSI	xtsi	22R1			X	
OM	VER:MISC:XTSID3U	xtsi	22R1			X	
OM	VER:TSI:WIDEBAND	both	22R1			X	
OM	VER:UTMN	both	22R1			X	

XTSI Software Update Tool Feature (5113a)

16

Contents **Page**

XTSI Software Update Tool Feature (5113a)

16

1. Feature Description

1.01 The current software update tool provided for Expanded Time Slot Interchange (XTSI) is inadequate for use in field maintenance. This feature is the first phase of the evolution of this tool.

1.02 This feature is a streamlined version of the software update tool. Maintenance personnel can log onto a 1B and a 3B maintenance channel and input one short 3B command to execute any of the nine steps required to update a single *4ESS*™ switch XTSI frame.

1.03 Both maintenance channels must be active throughout the tools execution so that all messages, successes, and failures can be viewed; and appropriate action taken. Phase one of the tool requires manual analysis of verify and dump routines.

1.04 This Software Update Tool automates the procedure, reduces the risk of error, and requires substantial intervention only when failures occur. This tool also notifies the executor of failures, including the point of failure.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

Maintenance Key Points

6.01 This tool executes in steps, each containing a logical command set. The main steps of the old XTSI Software Update procedure include the following:

(1) Verify XTSI member number and Equipage.

(2) Dump 3B file headers and inhibit REX on 3B.

(3) Inhibit REX/PUSYS on 1B.

(4) Backup XTSI files.

(5) Copy XTSI files from 3B to target XTSI.

(6) Update XTSI SPUs, D3Us, and controllers to new software version.

(7) Set recent change software pointers to zero.

(8) Allows inhibits on 3B.

(9) Allows inhibits on 1B.

6.02 Each step of the new tool incorporates defensive checks, including the ability to determine if the current step can be executed. If actions of a previous step have not completed, the tool determines this and notifies the user.

6.03 If an error is encountered during tool execution and the tool aborts, execution can resume at the start of the aborted step. This requires maintenance personnel intervention.

6.04 All Software Update events are logged in using standard *4ESS* logging procedures. All 3B successes, completions, and errors go to the 3B maintenance channel. All 1B successes, completions, and errors go to the 1B maintenance channel.

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS* switches in the network to be running the 4E22 Release 1 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

8.01 There are two new Manual Pages that go with this feature. IM:UPDATE:XTSI and OM:UPDATE:XTSI were released with the 4E22 Release 1 Generic.

Carrier-Solutions Carrier Identification Code (CIC) Based Determinations Feature (5198)

17

Contents **Page**

Contents **Page**

Contents Page

Contents **Page**

Carrier-Solutions Carrier Identification Code (CIC) Based Determinations Feature (5198)

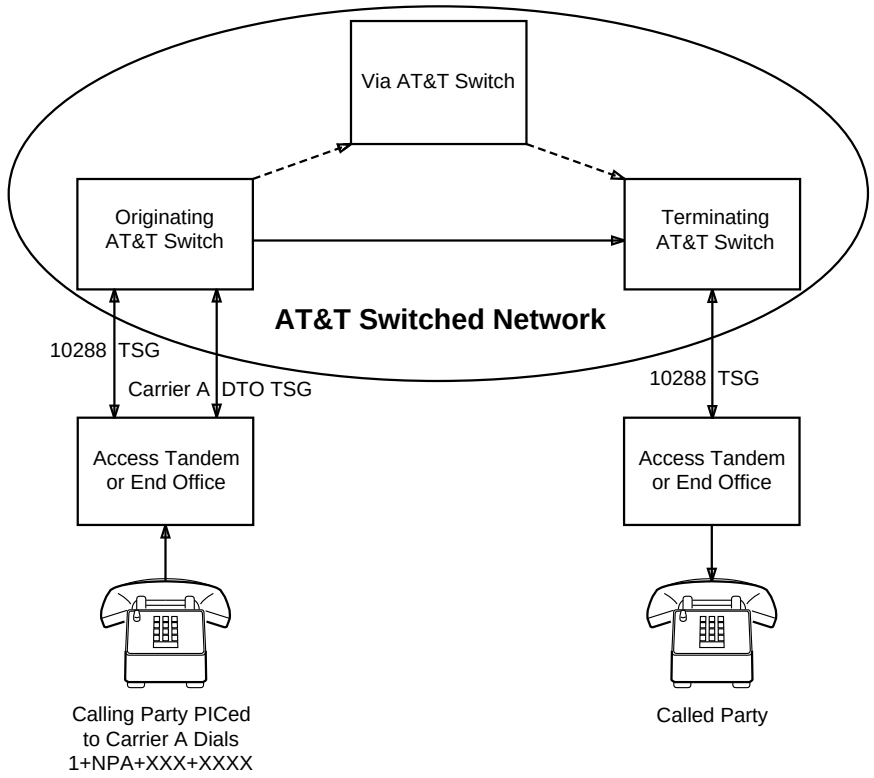
17

1. Feature Description

1.01 The Market Service Description (MSD) states that the Regional Bell Operating Companies (RBOCs) and General Telephone and Electronics (GTE) as a group, are estimated to capture 30 percent of the long distance market within five years. To mitigate the effect of market share erosion on revenues and unit network costs, AT&T is aggressively pursuing this group as wholesale AT&T customers or resellers.

1.02 With this feature, AT&T is able to offer long distance transport services to resellers based on Carrier Identification Code (CIC). See Figure 17-1. AT&T can now bill the reseller, instead of the caller, based on the CIC sent by the Local Exchange Carrier (LEC) switch with the call. With CIC-based determination, AT&T informs the LEC to route the reseller carrier's traffic on the 10288 switched access trunk groups to the *4ESS*™ switch. The LEC is told to send the CIC information with the call. The AT&T does not ask for 288 or 732 CICs because of the extra access charge imposed for delivery of this information. The AT&T network recognizes the reseller CIC as different from the AT&T CIC, assigns a unique service identity to be used in the intertoll network, and provides transport services with limited features for the call.

1.03 In areas where the reseller cannot send the CIC information to AT&T, the reseller sends to AT&T the reseller traffic on a separate switched access Trunk Sub-Group (TSG) called Dedicated Trunk Sub-group Option (DTO). This is identical to the way 10732 TSGs have been used.



Legend:

DTO - Dedicated Trunk Subgroup Option
PIC - Presubscribed Interexchange Carrier
TSG - Trunk Sub-Group

Figure 17-1. Example of Carrier Solutions Network Architecture 1 + Long Distance

Feature Conditions

1.04 The following are significant considerations that relate to this feature:

- For the non DTO TSGs, out-of-band Common Channel Signaling System 7 (CCS7) Integrated Services digital Network (ISDN) User Part-Network Interconnect (ISUP-NI) signaling is used between the LEC switch and the AT&T switch used to transport resell traffic.
- The DTO TSGs may use either Equal Access Multi-Frequency (EAMF) or CCS7 Network Interconnect (NI) Feature Group D Signaling to transport the resell traffic.
- This feature is not supported in areas where there is a *5ESS*® switch (toll switch) but no *4ESS* switch such as in Hawaii and Puerto Rico. This feature does not impact the *5ESS* switch. This feature is deployed in AT&Ts fully owned and partially owned *4ESS* switches including the Unitel and Anchorage *4ESS* switches.
- Resell traffic is non-service voice calls including voice-band data, such as fax. Data calls are not supported for this feature.
- For non-DTO TSGs, the local exchange switch is technically capable of including the CIC in the CCS7 signaling message to the AT&T network.
- Only 1+LD traffic and direct dialed international calls, incoming to the *4ESS* switch network from wired or wireless callers, are routed with resell call processing. This is based on a newly defined trunk group parameter, CIC Code-Table Trigger (CCTT), for DTO TSGs or a match in the CIC Code-Table for calls identified with a non-AT&T, resell CIC.
- There is no screening of the Automatic Number Identification (ANI) of an incoming call to confirm that the originating caller is a customer of the carrier.
- All resell traffic is billed to the carrier associated with the CIC of the incoming call.
- Raw, unrated call detail is available to the serving carrier on a daily basis. The format of the call detail provided is common to all carrier customers. The call detail is provided only for answered calls through a billing system interface.
- Resell traffic is not subject to any AT&T- branding announcements.
- Resell traffic is not subject to any ANI Trigger Table screening or to Network Call Denial (NCD).
- Resell traffic is not eligible for any ANI-based features or services such as Positive Call Processing or Software Defined Network.
- Resell traffic is optioned to avoid *TrueVoice* enhancements.
- Resell traffic is subject to Service Evaluation as per existing *4ESS* switch call-processing requirements.

- Currently, it is not feasible to provide a unique network announcement for reseller traffic using the Improved Service Announcement and Information Collection (ISAIC) Service Circuit System at the *4ESS* switch. As a result, no unique network announcements are required for this resell traffic.
- Originating access charges associated with Minutes of Use (MOU) is billed directly to the resell carrier by the originating local exchange carrier. The Non MOU based access charges are billed to AT&T, and AT&T recovers these access charges from the resell carrier.
- The CIC in the Carrier Information Parameter (CIP) of the incoming call received during call set up by the *4ESS* switch identifies resell traffic. This CIC-based determination is used instead of the dedicated trunk group option. Therefore, the combination of Trunk Group Rating Number (TRN) and Access Id is not used in this feature.
- Only non-AT&T CICs are eligible to be provisioned as resell CICs in the CIC Code-Table in the *4ESS* switches network wide. The AT&T CICs are not provisioned as resell CICs in the CIC Code-Table.
- The Originating AT&T switch (OAS) is the recording switch for this resell traffic.
- An existing CIC Code-Table in the *4ESS* switch has been enhanced to provide the CIC Code-Table functionality required for this feature.
- Network Capacity Management (NCM) uses existing processes to interface with Exchange Carriers and initiate the process of provisioning resell CICs for the exchange carriers in the *4ESS* switches.

Interim Architecture Support with Feature 5754

1.05 Network Access Interrupt (NAI) and Directory Assistance (DA) Feature 5754 provide interim NAI for fraud protection, as well as limited DA for Feature 5198. In order to meet contractual obligations, Feature 5754 requires the *4ESS* switch to query NAI for all resell calls. A resell call blocked by NAI receives an AT&T branded announcement. Unbranded 1+NPA+555+1212 DA calls without Directory Link (DL) service are provided for resell calls.

1.06 The *4ESS* switch routes resell calls that have a dialed number of NPA+555+1212 with a unique routing number to an Operator Services Position System (OSPS) in a *5ESS* switch. The OSPS routes these calls based on the unique routing number to a DA platform. Based on the unique routing number, the DA platform provides unbranded service.

1.07 Feature 5802 provides Modification Requests (MRs) to Feature 5754. These MRs do the following:

- At least one thousand entries are now supported in the CIC Code-Table instead of the previous limit of seven. For this feature, the memory needed for a worst case situation is now 20,000.
- The new CIC Code-Table can be changed using existing Recent Change and Verify forms.
- The NG Office Data Assembler has retrofitted the old TNS data provisioned to the new Transit Network Selection (TNS) table structure.

2. Call Flow

2.01 Two types of call flows are presented: Call Dialed to Domestic Termination and Call Dialed to International Termination.

Call Dialed To Domestic Termination

1. The calling party is either pre-subscribed (PICed) to an AT&T resell CIC or the calling party prefixes the dialed number with 1+0+CIC where CIC is an AT&T Resell Carrier Identification Code. The caller dials a 1+ 7-digit, or 1+10-digit North American Numbering Plan (NANP) number, or 1+0+CIC + the 7- or 10-digit NANP number. Either the PIC of the calling party or the 1+0+CIC dialed by the calling party causes the local exchange office to route the call over a switched access DTO TSG, or a switched access 10288 trunk group using CCS7 ISUP-NI signaling.

   NOTE:
   A resell carrier may arrange for a Local Service Provider (LSP) to disallow 10+CIC, 00+/-, or 011+ dialing of their CIC.

2. The call arrives at the *4ESS* switch OAS by way of the switched access DTO TSG or a 10288 trunk group. Equal Access Multi-Frequency (EAMF) or CCS7 ISUP-NI is used on the DTO TSGs. The CCS7 ISUP-NI signaling is used on the 10288 trunk group.
3. The OAS determines if the incoming call is a resell call in the following substeps.
   a. The OAS checks the setting of the office parameter On/Off switch for the resell feature. If the office parameter is set to Off, then the OAS proceeds with existing call processing for the call, *and this call flow ends.*
   b. If the office parameter is set to On, then the OAS checks the value of CIC Code-Table Trigger (CCTT), the newly defined switched access trunk group provisioning parameter. This newly defined trunk group parameter is needed to support the DTO option. Note that the DTO option does not require the CIC to be signaled to the OAS for resell calls. In this case, the value of the newly defined trunk group parameter is used by the OAS to identify resell calls. Also note that the value of CCTT is not passed in the trunk order to Service Now Trunking (SNOW-T), but instead, SNOW-T derives the value of CCTT from the new Trunk-Type Modifier (TTM) for DTO TSGs.
   c. If the CCTT switched access trunk group parameter is set to Y, then the *4ESS* switch identifies the call as a resell call, and the call flow proceeds to Step 4.

d. If the CCTT field is not present in the trunk group parameters or if the CCTT is set to N, then the OAS must use the CIC, if it is available, to determine if the incoming call is a resell call.

e. If the CIC is not available, then the OAS proceeds with existing call processing for the call, *and this call flow ends.*

f. The OAS uses the CIC signaled in the CIP during call setup to query the CIC Code-Table in the *4ESS* switch. If the result of the query is not resell, then the *4ESS* switch continues with existing call processing, *and this call flow ends*.

g. If the result of the CIC Code-Table query is resell, then the *4ESS* switch identifies the call as a resell call.

4. For calls identified as resell, the OAS sets the Signaling Service Type (SST) of the call to the new value of Long Distance Resell (SST21). Calls with an SST value of SST21 (RSLDS) are identified as resell traffic and receive basic Long Distance Service (LDS).

5. The OAS derives a new Class of Service (COS) based on existing parameters for TORIG, TDEST, and DNST. A new Service Identity of LDS resell is derived based on TORIG=LEC, TDEST=LEC, SST=SST21 (RSLDS), and DNST=UNAS. The Transport Capability of resell traffic is the existing value for voice. The Routing Pattern Index (RPI) is a value of 1 used for non-key voice traffic.

6. In addition to the Identification Indicator (II) and Originating Line Identity (OLI) values for which the OAS currently applies vacant code treatment to incoming calls, the OAS also applies vacant code to II and OLI values for the following resell calls:

   - Multiparty (01)
   - Hotel/Motel (06)
   - Coinless (07)
   - Coin/Non-Coin (23)
   - Coin (27)
   - Outward Wide Area Telecommunications Service (OUTWATS) (52)
   - Telecommunications Relay Service (TRS) (66)
   - TRS 67
   - Private Virtual Network (PVN) (93).

The OAS applies vacant code treatment to II and OLI values of TRS 66 and TRS 67 for resell calls because these II and OLI values are handled by the *4ESS* switch as an operator-requested call with the implementation of Consolidated Access Traffic (CAT). This prevents the OAS from triggering special features for the call. For example, an incoming call signaled with an II or OLI value of 93 would trigger the *4ESS* switch to switch the call to the Software Defined Network Access (SDNA) domain and provide Software Defined Network (SDN) service. This would be undesirable because ANI-based features such as SDN are not supported in this feature for resell calls.

7. The OAS does not perform an SD Query from the 1B Processor for resell calls. This feature remains in Present Mode of Operation (PMO) and does not transition to the Segmentation Directory (SD) architecture in Phase I or Phase II of the SD. As a result, the *4ESS* switch proceeds and does not wait for a response from the SD for resell calls. In addition, the *4ESS* switch ignores any response from the SD, if received, for resell calls.
8. The OAS does perform an NAI query for resell calls.
9. The OAS does not deny the 1+NPA+555+1212 directory assistance, however, it does deny directory link service for resell calls. Note that this does not prevent the support of directory assistance and directory link services for resell calls if the calls are sent directly to the *5ESS* switch OSPS (not via an AT&T *4ESS* switch).
10. The OAS bypasses a look-up of the Adjunct-Based Capability (ABC) ANI Trigger Table (ANI-TT) and Destination Number Trigger Table (DN-TT) for resell calls. By passing the ABC ANI-TT, the *4ESS* switch effectively denies ANI based features including Positive Call Processing (PCP) application treatment, SDN, Leave A Message (LAM) in explicit mode, 1+H/M, and Switch-Based NCD.
11. The OAS does not perform a Universal Subscriber Data Structure (USDS) query for resell calls. If the OAS is in implicit mode, the OAS does not invoke LAM for resell calls. Although both implicit mode and explicit mode have been implemented in the *4ESS* switch, the current plan is to use the *4ESS* switch in explicit mode only.
12. The OAS translates the called party number.
    a. The OAS applies vacant code for operator requested calls.
    b. The OAS applies vacant code for toll-free, 500, 700, 710, or 900 calls.
13. The OAS supports the option to avoid *TrueVoice* enhancements for resell calls. The OAS does not invoke Forced Intertoll Routing (FITR) for resell calls. Routing resell traffic through the intertoll network with *TrueVoice* avoidance prevents the OAS from invoking FITR for resell calls.
14. The OAS applies vacant code for data calls that are also identified as resell calls.
15. The remainder of the call flow is common to what would be provided for any other LDS call. The OAS routes the call and initiates an AMA record for the resell call.

16. If the CIC is available, the OAS or Call Detail Recording Platform (CDRP) records the CIC of the call in Table 57 in Extended Bellcore AMA Formats (EBAF) Module 941 (Expanded Switched Access Module). In addition to the existing triggers for Module 938, the OAS or CDRP appends Module 941 to all AMA records for resell calls. The OAS or CDRP also sets the IC/INC Indicator to reseller in Table 923 in Module 941 for resell calls. Note that existing triggers for Module 938 in the CDRP and the *4ESS* switch are applicable for Module 941 when this feature is deployed.

Call Dialed to International Termination

1. The Calling Party is either pre-subscribed (PICed) to an AT&T resell CIC, or the calling party prefixes the dialed number with 1+0+CIC, where CIC is an AT&T resell carrier identification code. The caller dials 011+CC+NN (or 1+0+CIC +011+CC+NN) or 1+NPA-NXX-XXXX (or 1+0+CIC + 1+NPA-NXX-XXXX), where the NPA or NPA-NXX could be for an IWZI destination. Calls to Canada and nations in the Caribbean are international calls that fall within the NANP. Either the PIC of the calling party or the 1+0+CIC dialed by the calling party causes the local exchange office to route the call over a switched access DTO TSG or a switched access 10288 trunk group using CCS7 ISUP-NI signaling. A resell carrier may arrange for a Local Service Provider (LSP) to disallow 10+CIC, 00+/-, or 011+ dialing of their CIC.
2. The call arrives at the *4ESS* switch OAS by way of the switched access DTO TSG or a 10288 trunk group. An EAMF or CCS7 ISUP-NI can be used on the DTO TSGs. The CCS7 ISUP-NI signaling is used on the 10288 trunk group.
3. The OAS determines if the incoming call is a resell call.
    a. The OAS checks the setting of the office parameter On/Off switch for the resell feature. If the office parameter is set to Off, then the OAS proceeds with existing call processing for the call, *and this call flow ends.*
    b. If the office parameter is set to On, then the OAS checks the value of CCTT, the newly defined switched access trunk group provisioning parameter. This newly defined trunk group parameter is needed to support the DTO. Note that the DTO does not require the CIC to be signaled to the OAS for resell calls. In this case, the value of the newly defined trunk group parameter is used by the OAS to identify resell calls. The value of CCTT is not passed in the trunk order to SNOW-T, but instead, SNOW-T derives the value of CCTT from the new Trunk To Trunk Path Memory (TTM) for DTO TSGs.
    c. If the CCTT switched access trunk group parameter is set to Y, then the *4ESS* switch identifies the call as a resell call and the call flow proceeds to Step 4.

d. If the CCTT field is not present in the trunk group parameters or if CCTT is set to N, then the OAS uses the CIC, if it is available, to determine if the incoming call is a resell call.

e. If the CIC is not available, then the OAS proceeds with existing call processing for the call, *and this call flow ends*.

f. The OAS uses the CIC signaled in the Transit Network Selection (TNS) during call setup to query the CIC Code-Table in the *4ESS* switch. If the result of the query is not resell, then the *4ESS* switch continues with existing call processing, *and this call flow ends.*

g. If the result of the CIC Code-Table query is resell, then the *4ESS* switch identifies the call as a resell call.

4. For calls identified as resell, the OAS sets the SST of the call to the new value of SST21 (RSLDS). Calls with an SST value of SST21 (RSLDS) are identified as resell traffic and receive basic LDS service.

5. The OAS derives a new COS based on existing parameters for TORIG, TDEST, and DNST. A new Service Identify of International Long Distance Service (ILDS) outbound resell is derived based on TORIG=LEC, TDEST=ISC or IWZI, SST=SST21 (RSLDS), and DNST=UNAS. The Transport Capability of resell traffic is the existing value for voice. The RPI is a value of 2 used for ILDS-Outbound traffic, and the End-to-End Class of Service RPI (ERPI) is the value 33 used for non-key international voice traffic.

6. In addition to the II and OLI value for which the OAS currently applies vacant code treatment to incoming calls, the OAS also applies vacant code to II and OLI values for the following resell calls:

   - Multiparty 01
   - Hotel/Motel 06,
   - Coinless 07
   - Coin/Non-Coin 23
   - Coin 27
   - Outward Wide Area Telecommunications Service (OUTWATS) 52
   - TRS 66
   - TRS 67
   - PVN 93.

   The OAS applies vacant code treatment to II/OLI values of TRS 66 and TRS 67 for resell calls because these II and OLI values are handled by the *4ESS* switch as an operator-requested call with the implementation of CAT.

7. The OAS does not perform an SD Query from the 1B Processor for resell calls. This feature remains in PMO and does not transition to the SD architecture in Phase I or Phase II of SD. As a result, the *4ESS* switch proceeds and does not wait for a response from SD for resell calls. In addition, the *4ESS* switch ignores any response from the SD, if received, for resell calls.
8. The OAS does perform an NAI query for resell calls.
9. The OAS bypasses a look-up of the ABC ANI-TT and DN-TT for resell calls. By passing the ABC ANI-TT, the *4ESS* switch effectively denies ANI based features including PCP application treatment, SDN, LAM in explicit mode, 1+H/M, and Switch-Based NCD.
10. The OAS does not perform a USDS query for resell calls. If the OAS is in implicit mode, the OAS does not invoke LAM for resell calls. Although both implicit mode and explicit mode have been implemented in the *4ESS* switch, the current plan is to use the *4ESS* switch in explicit mode only.
11. The OAS translates the called party number. The OAS applies vacant code for international toll-free calls as part of the Universal International Freephone Number (UIFN) service.
12. The OAS supports the option to avoid *TrueVoice* enhancements for resell calls.
13. The OAS applies vacant code for data calls that are also identified as resell calls.
14. The remainder of the call flow is common to what would be provided for any other ILDS call. The call is routed to the correct International Switching Center (ISC), and the OAS initiates an AMA record for the resell call.
15. If the CIC is available, the OAS or CDRP records the CIC of the call in Table 57 in EBAF Module 941 (Expanded Switched Access Module). In addition to the existing triggers for Module 938, the OAS or CDRP appends Module 941 to all AMA records for resell calls. The OAS or CDRP also sets the IC/INC Indicator to reseller in Table 923 in Module 941 for resell calls. Note that existing triggers for Module 938 in the CDRP and the *4ESS* switch are applicable for Module 941 when this feature is deployed.

3. Provisioning

3.01 The following items have been created and administered through provisioning to ensure successful implementation of this feature:

- The resell office switch parameter is turned on using existing Recent Change (RC) Form 809.
- Two new Service Identification Indicator (SII) values for resell calls have been created.
- Two new SII values have been mapped for resell calls.
- Two new SII values have been mapped for resell calls to RPI values. New SII values have been mapped for resell calls terminating internationally to existing ERPI.
- Two new SII values for resell calls have been turned on for ASCIT Question Number 17 in the ASCIT Table: "Is FVSR/CSRO to be used to route calls?".
- Two new SII values for resell calls have been turned on for ASCIT Question Number 13 in the ASCIT Table: "Is the terminating recording data set to ON for this SII?".
- The new 3-Digit Type Table in *4ESS* switches has been provisioned network-wide with Numbering Plan Areas (NPAs) of 500, 700, 710, 900, and domestic toll-free (8YY) for resell calls using an existing RC form.
- The CCTT trunk group parameter has been provisioned for DTO trunk groups with a value of Y using an existing RC form.
- For future development, the Country Code Conversion Table will be provisioned in the *4ESS* switches network-wide with country code 800 for resell calls using an existing RC form.
- The CIC Code-Table has been provisioned in the *4ESS* switches network-wide with resell CICs using existing RC Form 633.
- For future development, the II Table will be provisioned in the *4ESS* switches network-wide with values of 01, 06, 07, 23, 27, 52, 66, 67, and 93 for resell calls using an existing RC form.
- For future development, the OLI Table will be provisioned in the *4ESS* switches network-wide with values of 01, 06, 07, 23, 27, 52, 66, 67, and 93 for resell calls using an existing RC form.
- The new SST value of SST21 (RSLDS) has been provisioned for resell calls.
- A unique routing number for directory assistance calls has been provisioned for resell calls using RC Form 800.

Recent Change Forms Affected

A. Recent Change Form 809

3.02 The RC Form 809 is used to enable or disable this feature. The Carrier Solutions CIC Based Determinations feature is activated or deactivated by populating the FEATURE ITEM field with PF30 and setting the ON OR OFF field to either ON or OFF. To activate the feature, set the ON OR OFF field to ON. To deactivate the feature, set the ON OR OFF field to OFF. The default is OFF.

B. Recent Change Forms 100, 101, 107, and 108

3.03 Field S3 in these RC forms, a trunk subgroup parameter, indicates whether or not to resell a call. The S3 field can have the following values: Blank or N = do not resell; Y = resell; the default is N. Field CCTT will replace field S3 in a future Product Release.

C. Recent Change Form 633

3.04 The RC Form 633 is used to provision *4ESS* switches network wide with resell CICs. The transit network selection type TNSTYP field on this form has a new assigned form input entry for this feature. The new entry is RSEL. For domestic resell calls, the TNSTYP field must be populated with RSEL for TNSI = 0.

D. Recent Change Form 334

3.05 In a future product release RC Form 334 will be used to make modifications and updates to the current II and OLI tables residing in the *4ESS* switch.

E. Recent Change Form 800

3.06 The RC Form 800 is used to provision a routing number in the *4ESS* switches network wide (Feature 5754).

F. Recent Change Forms 301, 302, and 303

3.07 These RC forms are used to provision the routing number for resell calls not to receive Directory Link Services (DLS) in the *4ESS* switches network wide (Feature 5754).

Verify Forms Affected

A. Verify Forms 1a, 1b, and 11d

3.08 The S3 field in Verify Forms 1a, 1b, and 11d indicates whether the call is accepted for resell.

B. Verify Form 13d

3.09 The DIGTYP field in Verify Form 13d indicates a request for resell service when it equals DT10.

C. Verify Form 16ab

3.10 The TNSTYP field in Verify Form 16ab now has a new valid search value of RSEL.

D. Verify Form 6ai

3.11 If items OD4CCTTNSO through OD4CCTTNS15 in the OD4CCTTNS structure contain the value 4ODCCTRESELL, RSEL is outputted for the TNSTYP field.

E. Verify Form 8j

3.12 Verify Form 8j indicates when this feature has been enabled. Item PF30 identifies carrier solutions CIC-based determination. The ON OR OFF field indicates the status of the feature.

4. Recording

Recording Impacts

4.01 The *4ESS* switch and the Call Detail Recording Platform (CDRP) record the 3 or 4 digit CIC, if available. It is recorded in the Interexchange or International Carrier Code in Table 57 in Extended Bellcore AMA Formats (EBAF) Module 941 (Refer to Table 17-A). They also set the Interexchange Carrier (IC) and International Carrier (INC) indicators to reseller for resell calls in Table 923 in Module 941. The AMA records resell calls generated by the OAS and sends them to the Billing Data Transport System (BILLDATS).

4.02 The Recorded Information Collection System (RICS) receives the AMA records from BILLDATS with the CIC, if available, in the EBAF module. The RICS identifies resell calls based on a value of reseller in the IC and INC indicators in Table 923 in Module 941. The RICS maps the CIC, if available, for resell AMA records to a 10-digit North American Numbering Plan (NANP) Billing Number (BN) and sends the call detail records to the Software Defined Network (SDN) MPS. If the CIC is not available, RICS uses the process defined in Feature 5351 to send the call detail records with a 10-digit NANP BN Trunk Group Rating Number (TRN) to SDN MPS. The SDN MPS then creates the bill and sends it to the resell carrier associated with the BN in accordance with billing requirements.

Call-Originating Treatment

4.03 The *4ESS* switch provides the office parameter "resell" for this feature. If the resell office parameter is set to Off, then the call-processing requirements for this feature do not apply.

Call Routing

4.04 Calls identified with SST=SST21 (RSLDS) have an SII value of LDS resell if the call terminates domestically, or ILDS OUTBOUND resell if the call terminates internationally.

Call Recording and Billing

4.05 The CIC in the CIP or TNS, if it is received in the Initial Address Message (IAM), is recorded in Module 941 for resell calls. An indicator is also set for resell calls in Module 941. Module 941 is the same as Module 938 with an additional field to record the Jurisdiction Information Parameter (JIP) and an additional field to record the reseller indicator. Module 941 is appended for call codes 60 (station paid) which includes structure codes 0001, 0101, 1078, 1080, 1500, and 1501 or call code 306 (cellular mobile carrier) which includes structure codes 0001, 0101, 1500, and 1501. The switched access resell calls are recorded in the same structure codes that are used to record switched access 1+LD, and direct dialed international calls.

Call Recording and Event Determinants

4.06 Whether or not the CIC is available, the *4ESS* switch that is recording appends the Expanded Switched Access Module to all switched access resell calls. The Expanded Switched Access Module (Module 941) has replaced the previous Switched Access Module (Module 938). All existing triggers for Module 938 are applicable for Module 941. Module 941 is appended to structures 1500 and 1501.

4.07 Table 57 is populated with the CIC information, when available, and Table 923 is populated with the resell information. If the CIC code is not available, Table 57 is populated with Hex Fs, including the sign character. If the resell information is not available, Table 923 is populated with the default value for no indication.

Call Recording Formatting

4.08 If Module 941 (Refer to Table 17-A.) is appended to the AMA record, the *4ESS* switch recording-switch records the existing fields. The JIP number field in AMA Table Number 25 is populated with hexadecimal F characters in all table positions including the sign character. The CIC, if available, is recorded right justified in characters 1 through 4 of the IC/INC (CIC) Number field in AMA Table Number 57. Character 5 of the IC INC Number field in AMA Table 57 is set to one. The IC INC Indicator field in AMA Table Number 923 is set to one for a resell call. Otherwise, it is set to zero.

4.09 If the CIC is not available, Table Number 57 is populated with hexadecimal F characters in all Table positions including the sign character.

Table 17-A. Module Code 941, Expanded Switched Access Module

Information	Table Number	Number of Characters
Module Code	88	4
Incoming Trunk Group Number	83	6
OLI Value/II Digits	421	4
Rating Point Billing Number	25	12
IC/INC Indicator	923	2
IC/INC (CIC Code)	57	6
JIP	25	12

5. Network Management

Impact on Operating Systems

A. Access Capacity Management System

5.01 The Access Capacity Management System (ACMS), which is impacted by this feature, provides an on-line inventory of switched access trunk group records. The switched access engineers Network Capacity Management (NCM) use this system to issue Access Service Requests (ASRs) automatically to the Exchange Companies through the Interexchange Carrier Service Center (ICSC). The Switched Access Engineers also use ACMS for validation of the ASR orders and to coordinate issuance of message trunk orders to the toll-connect engineers. The ACMS also influences servicing decisions, such as: to add, change, or reduce trunk quantities for the switched access engineers.

5.02 The ACMS is also used for special nodal circuits and facilities. It serves as the automated interface to the exchange companies and, maintains special circuit and facility inventories.

5.03 With this feature, the ACMS is now used by NCM to send ASRs to LECs indicating the addition or deletion of a new resell CIC in the AT&T network. The capability to send an ASR with a single CIC to the LEC has been previously supported in ACMS. Now, ACMS is used by NCM to send an ASR with multiple CICs to the LEC. The ACMS is also used to make servicing decisions to add, change, or reduce switched access trunk quantities for trunk groups transporting resell traffic.

B. AT&T Network Servicing

5.04 The AT&T Network Servicing (ANSER) System is an integrated trunk group servicing system which consists of the following subsystems:

- ANSER Access
- ANSER Intertoll
- ANSER International.

5.05 The ANSER Access subsystem is required to service 10288 switched access trunk groups transporting resell traffic based on a given prorated forecast for each resell carrier. No development has been required in ANSER Access for this feature.

5.06 The ANSER Intertoll and ANSER International subsystems are not impacted by this feature.

C. Centralized Message Data System

5.07 The Centralized Message Data System (CMDS-II), which is impacted by this feature, collects call detail data and feeds other systems used for trunk forecasting, trunk servicing, and access charge verification.

5.08 The CMDS-II, collects call detail data from the Resell Billing System which is enhanced to support the billing of resell calls. The CMDS-II uses this data to feed Forecast Access Requirements (FAR) and Intertoll Trunks and Load Forecasting (ITLF) for trunk forecasting and trunk servicing. The CMDS-II receives the CIC and the IC/INC Indicator as a part of the five percent call detail data feed from the Resell Billing System.

D. Common Master File

5.09 The Common Master File (CMF) provides a single corporate repository for maintaining planned network switching and interconnect arrangement relationships within and below the AT&T Toll Switches. The CMF deals only with Intertoll trunks.

5.10 Since this feature uses the existing interconnect arrangement relationships within and below the AT&T Toll Switches, CMF is not impacted by this feature.

E. CCS7 Performance and Alarm Monitoring

5.11 The CCS7 Performance and Alarm Monitoring (CPAM) System performs real-time monitoring for the DS-1 network which supports signaling links and isolates defective facility equipment. The CPAM is integrated with the Facility Performance Analysis System (FPAS). The CPAM has no new requirements for this feature.

F. DARICS and DEMS

5.12 The Data Acquisition Reports Integrated Communications System (DARICS), which is impacted by this feature, is composed of switching and signaling systems. The switching system collects traffic measurements, *4ESS* switch memory data, Trunk Sub-group (TSG) characteristics, and equipment inventory from the *4ESS* switch, *5ESS* switch OSPS, and Signal Transfer Point (STP) network elements. The traffic measurements are used by the work centers to monitor the performance of the switch and for engineering components within the switch for growth in traffic and for providing new services to customers. In addition, DARICS transmits the collected measurements to other support systems which facilitate the maintenance and administration of the AT&T Switched Network (ASN).

5.13 The Dynamic Engineering Mechanized System (DEMS), which is impacted by this feature, is a switch-engineering application that provides the following:

- The capability to monitor the use of various switch equipment in terms of the memory usage, terminations, and real-time availability

- The hardware and software sizing within the switch to support the next growth interval
- The placing of switch component orders to network systems.

5.14 The DARICS and DEMS also include the CCIS Network Forecasting System, (CNFS), SLINKY, and CRIS/CLAD which are Signaling Systems. The SLINKY is a signaling network capacity forecast and planning system. It provides 5-year forecast for various signaling links (A/B/D/E/F), and 2STP real-time utilization and terminations. As a signaling planning system, it also allows the user to perform some "what-if" studies to evaluate the impact on the signaling network resource (link requirements) due to change of service load or network configurations. The primary users of the system are Common Channel Signaling (CCS) Design and Implementation District (CDID) forecast group and Network Capacity Planners in Atlanta.

5.15 The DARICS and DEMS need to accommodate longer ISUP messages as a result of the CIC signaled during call setup to identify resell calls on the switched access 10288 trunk groups.

G. Forecast Access Requirements

5.16 The FAR System, which is impacted by this feature, supports the forecasting function for switched access trunk groups making use of a five percent call detail sample received from CMDS.

5.17 The FAR is required to provide trunk forecasting for 10288 switched access trunk groups transporting resell traffic based on a given prorated forecast for each resell carrier. The FAR uses the CIC, and the IC and INC Indicator received in the feed from CMDS-II to distinguish resell call detail records from LEC call detail records. The FAR also receives a feed from Single Source Data (SSD) to provide trunk forecasting for resell traffic.

H. Intertoll Trunks and Load Forecasting

5.18 The Intertoll Trunks & Load Forecasting (ITLF), which is impacted by this feature, provides a forecast of traffic loads and intertoll trunk quantities for Real Time Network Routing (RTNR), hierarchical, and switched digital services.

5.19 An existing load category is used to forecast resell traffic. The Customer Specific Call Routing (CSCR) (Phase I and Phase II) is used to route resell traffic with *TrueVoice* avoidance on *TrueVoice*-less trunks. The ITLF investigates the capacity impacts on the intertoll network based on the reseller traffic load forecasts provided for the years 1996, 1997, and 1998.

I. Mechanized Design Layout Record System

5.20 The Mechanized Design Layout Record System (MDLRS) which is not impacted by this feature, is a support system that facilitates the preparation of facility and circuit orders. The MDLRS accepts a feed from Single Source Data (SSD) to obtain trunk group data elements and passes order information to Network Core Data.

J. Network Core Data

5.21 The Network Core Data is a database containing circuit-provisioning data and facility-provisioning data. The NCDN, which is not impacted by this feature, accepts information from MDLRS and passes information to Service Now - Trunking (SNOW-T).

K. Network Management Operations System

5.22 The Network Management Operations System (NEMOS) receives critical network events as they occur, and additional data from the network on scheduled 30-second and 5-minute boundaries. The NEMOS, which is not impacted by this feature, analyzes all of the available data to identify reported problems and also to anticipate developing problems within the network.

L. Network Operations Trouble Information System-III

5.23 The Network Operations Trouble Information System-III (NOTIS-III) interfaces with the BCS Maintenance Platform (BMT) and Card Provisioning Process (CPP) to collect and analyze customer trouble reports and customer profiles. The NOTIS-III, which is not impacted by this feature, identifies trouble patterns and distributes these to the appropriate work center for analysis, referral, and resolution.

M. Predictive Zero Maintenance and Integrated Maintenance Platform

5.24 The Predictive Zero Maintenance and Integrated Maintenance Platform (PZM/IMP) is a platform that supports the maintenance and testing of circuit switched trunks in the network. The PZM/IMP is not impacted by this feature.

N. Signaling Network Administration Platform

5.25 The Signaling Network Administration Platform (SNAP) is an administration, provisioning, and engineering system used to provision Management Information System Data Link Terminal Process (MTP) routing and Signaling Connection Control Part (SCCP) Global Title Translations (GTT) data in the 2STPs. The SNAP, which is not impacted by this feature, stores link records for Common Channel Signaling (CCS) network configuration and routing data needed by the STPs and Network Control Points (NCPs).

It also provides a command interface to CNOS-RCS for provisioning the Recent Change data in the STPs and NCPs. This platform consists of the following operation systems:

- CINTAS - The CCS Network Total Administration System (CINTAS) is an on-line database used by CDID to plan, build, and administer the CCS network. The CINTAS maintains the signaling network reference database which contains all of the data to support routing for the signaling network.
- NIFTI - Network Interconnect FPSC (Full Point Code Routing) Transaction Interface (NIFTI).

O. Signaling Network Analysis System

5.26 The Signaling Network Analysis System (SNAS) is a network monitoring and analysis tool. The SNAS counts and stores Common Formatted Irregularity Messages (CFIMs) which are generated from the Call Irregularity Messages (CIMs) sent by switches in the CCS network. The counts are used to establish an average pattern of network noise; when the average is greatly exceeded, SNAS generates alerts that are graphically displayed on the Network Operations Center (NOC) wallboards. Network analysts can use SNAS to isolate and perform comparative frequency counts on stored CFIMs to further analyze network anomalies.

5.27 When a call setup experiences irregularity, the *4ESS* switch generates a CIM. One of the SNAS functions is to determine the Distant Entity (DE) of an incomplete call attempt from the CIM. A DE is the network entity that the office reporting the CIM was attempting to communicate with at the time of the irregularity. The SNAS uses its internal databases, which contain the network architecture, to determine the DE and its home STP.

P. Service NOW - Routing

5.28 Service NOW - Routing (SNOW-R) is an Operation Support System (OSS) platform that encompasses the following OSSs:

- The Common Network Routing Database (CNRDB) is the corporate database of routing and network topology information related to the ASN.
- The Integrated Routing Assignment System (IRAS) is a rule based family of subsystems that examine the changes reported in CNRDB and determine which switches are affected. It derives impacts, provides Network Routing Order (NRO) instructions to the Network Services Provisioning (NSP) agents, and constructs the Recent Changes (RCs) necessary to update the *4ESS* switches.
- Network Routing Automator (NRA) is a rule-based system that is used to update CNRDB with routing information received from Access and Nodal provisioning orders.

5.29 The SNOW-R is responsible for provisioning and maintaining the resell CICs in the CIC Code-Table at each of the *4ESS* switches so that any resell traffic routed to an originating *4ESS* switch receives limited services and transport capability.

5.30 The SNOW-R provides a mechanism for authorized users to input Identification Indicator (II) and Originating Line Identity (OLI) values for resell calls in the II and OLI tables at all AT&T proprietary *4ESS* switches. Recent Change Form 334 is used to make modifications and updates to the current II and OLI tables residing in the *4ESS* switch. The SNOW-R provides a validation response to the authorized user upon successful completion of transaction.

Q. Service Now - Trunking

5.31 The Service Now - Trunking (SNOW-T) Systems include the following:

- Testing, Operations, Provisioning, and Administration (TOPAS)
- Network Services Automator (NSA)
- User interface to TOPAS (TOPAS - Net).

5.32 The SNOW-T is used to support the administration of the Dedicated Trunk Sub-group Option (DTO) switched access Trunk Sub-Groups (TSGs) on the *4ESS* switch.

5.33 The SNOW-T supports the new trunk group parameter CIC Code-Table Trigger (CCTT) with the associated validation rules and Methods and Procedures (M and Ps) required for DTO TSGs. The SNOW-T derives the value of CCTT from the rules for the DTO TTM and provisions the value of CCTT in the associated recent change. The value of CCTT is set to Y for DTO TSGs.

NOTE:
The CCTT is not included in the trunk group order for DTO TSGs. In other words, SNOW-T does not receive the trunk group parameter CCTT in the trunk group order from Network Core Data.

R. Servicing, Ordering, Forecasting Expert Advisor

5.34 The Servicing, Ordering, Forecasting Expert Advisor (SOFEA) System, which is not impacted by this feature, automates the sizing and ordering for switched access trunk groups. The SOFEA provides suggestions to the Switched Access Engineer of NCM when to release an Access Service Request (ASR).

S. SPEEDY

5.35 The SPEEDY, a capacity planning tool, may be impacted by this feature. It calculates *4ESS* switch capacity exhaust and determines methods to relieve overloaded switches. The SPEEDY provides a capability to perform "what if" studies on intertoll trunking and switched access trunking.

5.36 The CSCR (Phase I and Phase II) is used to route resell traffic with *TrueVoice* avoidance on *TrueVoice*-less trunks. The SPEEDY must perform "what if studies" on intertoll trunking and the *4ESS* switch capacity exhaust caused by the increase in terminations used to maintain the intertoll trunks for resell calls. The "what if" study is based on the reseller traffic load forecasts provided for years 1996, 1997, and 1998.

T. Single Source Data

5.37 The Single Source Data (SSD) provides a single corporate repository for maintaining planned network switching and interconnect arrangement relationships within and below the AT&T Toll switches. The SSD, which is impacted by this feature, is the data entry operating system for trunk-provisioning data for message trunks.

5.38 The SSD is required to inventory the CIC at a trunk group level. This is needed to keep track of the ASRs sent to the access tandems or LECs and to determine whether any given CIC is open in an access tandem or end office.

U. System for Test Access and Maintenance of Protocol-Based Services

5.39 The System for Test Access and Maintenance of Protocol-based Services (STAMPS) is a system used in the network to perform preservice testing and maintenance of ISDN Priority Call (PRI) trunks. The STAMPS provides a database function to support an accurate protocol trouble history and flexible retrievals of trouble patterns. The STAMPS is not impacted by this feature.

V. Total Network Management

5.40 The Total Network Management (TNM) System, which is impacted by this feature, provides centralized remote surveillance, monitoring, and OA&M capabilities in support of switching and transmission network elements such as 2NCP, 2STP, and the *4ESS* switch. The TNM (formerly SCCS) interfaces directly to the network elements (NEs) to provide these capabilities.

5.41 Through TNM, the Network Control Center (NCC) and other centers, such as the National Electronic Switching Assistance Center (NESAC) and the NOC, receive alarms when critical changes in the maintenance state of the NEs occur.

The TNM logs all maintenance class output messages generated by the Network Elements (NEs) and allows users to filter and browse the data, or alert on it. The TNM interface also provides the users with control capabilities over the NEs through NE-provided input commands.

5.42 The TNM receives formatted Module 941s in the Service Measurement Reports from the CDRP and *4ESS* switch.

Billing System Impacts

5.43 The SDN Billing System is used to support the Carrier Solutions billing function.

Operations Center Impacts

A. Access Management

5.44 A primary function of Access Management is to ensure the accuracy of the bills AT&T receives from access vendors. This is currently accomplished through processes which focus on assuring the quality of the bills issued by the vendors as opposed to older processes which focus on validating the bills after receipt. Current processes will not be impacted by this feature.

5.45 Access management supports Network Capacity Management (NCM) in the effort required to order Carrier Information Parameter (CIP) delivery from the LECs on the switched access ISDN User Part Network Interconnect (ISUP-NI) signaled 10288 trunk groups for reseller traffic. Specifically, the Local Infrastructure Access Management (LIAM) organization serves as a primary AT&T interface to the local exchange companies for access issues. To ensure a clear understanding by the local exchange companies of the Carrier Solutions strategy for distributing originating access charges, and because AT&T is operating under a Letter of Agency from the Carrier Solutions customer, LIAM will negotiate an Agency Agreement. The agreement will represent AT&T's particular project needs with the applicable local exchange companies. The completion of this Agency Agreement will be a prerequisite to the NCM organization issuing ASRs to initiate the actual ordering and provisioning process.

5.46 This feature does not require AT&T CIC (288, 732, 686) codes to be sent by the reseller to AT&T. Whether the decision is made to send only non-AT&T resell CICs, or to send both AT&T and non-AT&T CICs during call setup from the local end offices will have no impacts on this feature.

B. CCS7 Design and Implementation District

5.47 The CCS7 Design and Implementation District (CDID) is responsible for provisioning, management, and maintenance of the AT&T signaling network. The CDID is comprised of multiple centers, among which is the Operations Network Administration Center (ONAC). There are no new impacts to CDID for this feature.

C. Headquarters Routing Planning

5.48 The Headquarters Routing Organization is responsible for supporting and defining the processes to be used for administering routing within the AT&T network. This organization also provides support for the initial introduction of new services in the network.

5.49 Headquarters routing planning, Bedminster, is responsible for the following activities associated with this feature:

- Turning the resell office switch parameter On by using existing RC Form 809, as *4ESS* switch Feature 5198 (Fast Feature Release), is deployed in the network.
- Creating two new SII values for resell calls.
- Mapping the two new SII values for resell calls to CSCI 2 with the deployment of CSCR Phase II.
- Mapping the two new SII values for resell calls to existing Routing Pattern Index (RPI) values and map the new SII value for resell calls terminating internationally to existing ECOS Routing Pattern Index (ERPI).
- Turning on the two new SII values for resell calls for ASCIT Question Number 17: "Is FVSR/CSRO to be used to route calls?" in the ASCIT Table.
- Turning on the two new SII values for resell calls for ASCIT Question Number 13: "Is the terminating recording data set to ON for this SII?" in the ASCIT Table.
- Provisioning the new 3 digit type table in *4ESS* switches network-wide with NPAs of 500, 700, 710, 900, and domestic toll-free (8YY) for resell calls using an existing RC form.

5.50 Headquarters routing planning, Kansas City, is responsible for provisioning the CIC Code-Table in the *4ESS* switches network-wide with resell CICs using RC Form 633.

5.51 In a future product release, international routing planning will be responsible for provisioning the Country Code Conversion Table in the *4ESS* switches network-wide with country code 800 for resell calls using an existing RC form.

5.52 Message Process Support is responsible for developing a process to receive orders from the Carrier Solutions Project Manager (CSPM) and coordinating the information to Headquarters Routing, Kansas City. An order is issued when a resell CIC needs to be added, changed, or deleted from the CIC Code-Table.

D. Intertoll Planning and Provisioning, and Intertoll Capacity Management

5.53 The Intertoll Planning and Provisioning (IPP) group is responsible for ordering intertoll facilities T1.5 and tracking the requests. The Intertoll Capacity Management (ICM) group is responsible for ordering the intertoll channels within the facilities.

5.54 The IPP and ICM are impacted if additional intertoll trunks are needed to support resell traffic in the intertoll network with *TrueVoice* avoidance.

E. National Automatic Message Accounting Control Center

5.55 The National Automatic Message Accounting Control Center (NAMACC) is responsible for the network element recording, collection, validation, and delivery of AMA records to downstream processing and ability systems. It is also responsible for the investigation of recording or billing irregularities.

5.56 In a future product release, the NAMACC will be responsible for provisioning the II Table in the *4ESS* switches network-wide with values of 01, 06, 07, 23, 27, 52, 66, 67, and 93 for resell calls using an existing RC form.

5.57 In a future product release, the NAMACC will be responsible for provisioning the OLI Table in the *4ESS* switches world wide with values of 01, 06, 07, 23, 27, 52, 66, 67, and 93 for resell calls using an existing RC form.

F. Network Control Center

5.58 The Network Control Center (NCC) is responsible for trunk maintenance for intertoll and switched access message trunks. The NCC-DS0 and NCC-Path Maintenance are two functional entities which exist within the NCC. A change in this area is anticipated in a future Product Release. The NCC-DS0 is responsible for DS0-level maintenance, and NCC-Path Maintenance is responsible at DS1 and higher levels. There are no new NCC impacts for this feature.

G. Network Capacity Management

5.59 The Network Capacity Management (NCM) group supports IPP for T1 facilities orders and also interfaces to LECs for other AT&T switched access service requests.

5.60 The NCM works in conjunction with Access Management to administer a new customer for this resale service. The NCM initiates zero quantity ASRs to access tandems, and LECs to open resell CICs in particular tandems or end offices.

H. Network Capacity Planning

5.61 The Network Capacity Planning switch planners perform switch planning and implementation. Network Capacity Planning is impacted by the increase in intertoll trunking that is needed to route the resell traffic with *TrueVoice* avoidance.

I. National Electronic Systems Assistance Center

5.62 The National Electronic Systems Assistance Center (NESAC) provides Tier 3 technical support to the NCCs, NOC, and the NSD Work Centers. They interface directly with the supported work centers, and with various customer service centers, to resolve complex customer and network-specific problems. The NESAC is divided into the following areas:

- CCS-NESAC (includes 2STP, 1NCP, and 2NCP)
- *4ESS* Switch
- *5ESS* Switch
- Network Field Support Group (NFSG)
- Adjunct Support Group.

The *4ESS* switch NESAC provides Tier 3 technical support to the NCC, NOC, and the NSD work centers to resolve complex customer and network-specific problems related to resell traffic.

J. Network Operations Center

5.63 The Network Operations Center (NOC) provides network monitoring and management functions for the overall AT&T network. It monitors network traffic for outages and blocking, and takes appropriate corrective actions. The NOC works with centers as required, such as NSC and TCC, to resolve domestic access and intertoll trunk and facility troubles.

5.64 The NOC is required to respond to SNAS alerts and NEMOS network management criteria for problems associated with resell traffic.

5.65 The NOC serves as the single point of contact for resell customer trouble reports. It is anticipated that trouble reports will require the NOC to be able to clear troubles (directly or by referral) in the following areas:

- Direct-connect facility and channel troubles
- LEC troubles related to routing calls from resell PICed customers to the DTO TSGs, and the switched access 10288 trunk groups.

K. Network Services Provisioning

5.66 The Network Services Provisioning (NSP), which is impacted by this feature, is responsible for performing the *4ESS* administration necessary to establish access, intertoll, and nodal trunk groups.

5.67 The NAMACC has primary responsibility to provision the II and the OLI Tables for resell calls. As a backup method, the NAMACC uses the NSP to provision the II and OLI Tables for resell calls.

6. Maintenance/Troubleshooting

Handoff Process

6.01 After service general availability, this feature will be handed off to the AT&T Business Communications Service (BCS) Life Cycle Management Team. The process is the same that is used for other BCS-sponsored features.

Final-Handling Codes

6.02 The Final-Handling Code (FHC) 1792 is generated for an incoming call identified as being from a resale carrier where II or OLI indicates the call as not valid for resale. The *4ESS* switch handles the call by connecting the call to the vacant code treatment.

6.03 The FHC 1793 is generated for an incoming call identified as being for a resale carrier but also requires operator assistance which is not allowed. The *4ESS* switch handles the call by connecting the call to the vacant code treatment.

6.04 The FHC 1794 is generated for an incoming call identified as being for carrier resale but also requires data transmission which is not allowed. The *4ESS* switch handles the call by connecting the call to the vacant code treatment for Multifrequency (MF), or "service unavailable" for ISDN User Part (ISUP).

6.05 The FHC 1795 is generated for an incoming call having been identified as being for carrier resale but also having a bad Numbering Plan Area (NPA), bad country code (in a future product release), or is denied a directory assistance call because of having no routing number. The *4ESS* switch will handle the call by connecting the call to the vacant code treatment.

6.06 The FHC 1796 is generated for NPA-555-1212 calls that are also identified as resell when an invalid routing number has been provisioned into the switch. The *4ESS* switch handles the call by connecting the call to the vacant code treatment. This FHC has been created as a result of Feature 5754.

Call Irregularity

6.07 The *4ESS* switch includes the CIC, if available, in the call irregularity message for all new and existing final handling codes for resell calls.

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS* switches in the network to be running the 4E22 Release 1 Generic for this feature to be fully operational.

Planning Considerations

7.02 Since Customer Specific Call Routing (CSCR) trunks are used for this feature, some planning time should be considered in the deployment schedules. Offices need engineering work and RC trunk Turn On prior to using this feature.

Turn On/Turn Off Mechanism

7.03 The RC Form 809 is used to enable or disable this feature. This feature is activated or deactivated by populating the FEATURE ITEM field with PF30 and setting the ON OR OFF field to either ON or OFF. To activate this feature, set the ON OR OFF field to ON. To deactivate the feature, set the ON OR OFF field to OFF. The default is OFF.

7.04 The RC Form 633 is used to provision *4ESS* switches network wide with resell CICs. The transit network selection type TNSTYP field on this form has a new assigned form input entry for this feature. The new entry is RSEL. For resell domestic calls, the TNSTYP field must be populated with RSEL for TNSI = 0.

7.05 This feature can also be turned ON or OFF by an absolute word change. However, it is highly recommended that RC Form 809 be used to turn on this feature where possible.

7.06 Item OD4PF30 in structure OD4OFCCOPY2 is used to turn this feature ON or OFF. The following is the information needed to turn ODA bit OD4PF30 ON or OFF using absolute word change. The default in both cases is OFF.

CAUTION:
The OD4OFCCOPY structure also contains the ON/OFF bits for many other features. Be certain that any changes you make only affect this feature.

- Structure: OD4OFCCOPY2
- Core address in 5198 Big Gulp: 7143405; in 4E22: 7145445
- Word: 5
- Size of OD4PF30: 1
- Displacement of OD4PF30: 5
- On: 1
- Off: 0

Verify Forms Affected

7.07 Verify Form 8j indicates when this feature has been enabled. Item PF30 identifies Carrier Solutions CIC Based Determination. The ON OR OFF field indicates the status of the feature.

Feature Dependencies

7.08 This feature is dependent upon the following features being deployed in the network:

- Carrier Identification Code Feature (4686)
- Circuit Selection Capabilities Routing Feature (4908)
- Carrier Solutions Dedicated Trunk Sub-group Option Feature (5351).

Feature Interactions

7.09 The interactions of this feature with other features are described in the following information.:

A. Local Number Portability

7.10 A Local Number Portability (LNP) Network Control Point (NCP) query can be triggered for an incoming call if the NPA-NXX of the ANI is opened to portability or if the NPA-NXX of the dialed number is opened to portability. For resell calls, LNP call processing on the dialed number is required to determine the Location Routing Number (LRN) of the dialed number to route the call to its termination. The LNP call processing is also required on the ANI for resell calls because the resell carrier may require both the ANI of the call as well as the LRN of the ANI to properly bill the calling party. Regardless of whether the ANI of the resell call has been ported, AT&T bills the resell carrier for the call. Recording is invoked at the OAS for resell calls, and LNP modules are appended in accordance with LNP requirements.

B. Quiet Hear

7.11 The Quiet Hear (QH) feature is triggered by dialed number and is only offered for 1-800-CALL-ATT traffic. All toll-free dialed numbers are blocked by the OAS for resell calls. As a result, there are no interactions between this feature and Quiet Hear. However, in the future if QH is offered for other services, resell calls will be routed through the intertoll network with the QH capability turned off.

C. Fraud Detection

7.12 The Toll Fraud Early Detection System (TFEDS) may be enhanced to support CIC-based fraud detection based on call detail records received from RICS in support of this feature. When TFEDS is replaced with Global Fraud Management System (GFMS) beginning in the fourth quarter of 1996, GFMS will be enhanced to support CIC-based fraud detection based on call detail records received directly from BILLDATS. If fraud is detected, TFEDS or GFMS will notify the reseller and AT&T; however, resell calls will not be blocked during real-time call processing.

D. TrueVoice Avoidance

7.13 The AT&T network supports the option to avoid *TrueVoice* for resell traffic. This is achieved by Customer Specific Call Routing (CSCR) Phase 1 which supports *TrueVoice*-less trunk routing through the ASCIT Table in the *4ESS* switch. The CSCR has been deployed in the network prior to this feature.

7.14 *TrueVoice* Plus is a subscription feature using the ANI-TT that provides enhancements for international calls. *TrueVoice* Plus enhancements are not provided to resell calls.

7.15 With the deployment of this feature, iPCC (individual Per-Call Control)-based *TrueVoice* avoidance is not used to route resell calls without *TrueVoice* enhancements through the intertoll network.

E. USDS Supported Features

7.16 The Universal Subscriber Data Structure (USDS) project has deployed 2CCP/NCP service processors that are part of the toll-specific call flow for this resell feature. The *4ESS* switch OAS determines if a call is eligible for a USDS query according to existing requirements. The 2CCP/NCP determines which feature apply to the call and sends call handling instructions to the *4ESS* switch.

7.17 The *4ESS* switch determines USDS query eligibility with either an explicit or an implicit USDS query method. The explicit USDS query method is the plan of record beginning with initial USDS availability. Using the explicit USDS query method, the *4ESS* switch queries a 2CCP/2NCP only if it finds a match in the ANI-TT with the USDS query indicator set. Since the ANI-TT is not queried for resell calls, there is no feature interaction if the *4ESS* switch is in explicit mode.

7.18 On the other hand, the *4ESS* switch implicit USDS query method does not rely on populating the ANIs eligible for USDS queries in the ANI-TT. In *4ESS* switches using the implicit USDS query method, all of the ANIs that should receive a USDS query will continue to receive a USDS query. However, the *4ESS* switch does not launch queries for resell ANIs.

7.19 The 2CCP/2NCP response is able to instruct the switch to invoke the AT&T Trigger Platform for Leave-A-Message (LAM) service. Since LAM can only be invoked if the *4ESS* switch queries USDS and the *4ESS* switch does not query USDS for resell calls, there is no interaction between LAM and this feature.

F. Connect 'N' Save

7.20 Connect "N" Save customers are PICed to Code 686. Therefore, Connect "N" Save traffic can be identified by the *4ESS* switch if the CIC of the call is signaled in the Initial Address Message (IAM) during call set-up. Code 686 is not provisioned as a resell CIC in the CIC Code-Table, therefore, the query to determine if the call is a resell call results in a no match found and the call continues with existing call processing. As a result, there are no interactions between Connect "N" Save and this feature.

G. Segmentation Directory

7.21 The SD is currently divided into four phases and Phase I is incorporated with this feature. This feature, however, provides only feature-less transport capability for resell traffic.

As a result, it has been necessary to prevent SD, if possible, from querying a service processor for resell traffic. The requirements implemented to achieve this are as follows:

- The *4ESS* switch will be in the present mode of operation for resell calls until this feature is migrated to SD. As a result, the *4ESS* switch proceeds and does not wait for a response from SD for resell calls.
- The 1B Processor does not generate an SD query for incoming switched access calls signaled to the *4ESS* switch using Equal Access Multifrequency (EAMF), or ISUP-NI that are also identified as resell calls.

7.22 With the deployment of this feature and SD Phase I, the *4ESS* switch generates an SD Query from the Direct Link Number (DLN) for incoming switched access resell calls signaled via ISDN User Part Network Interconnect (ISUP-NI). Based on the SD Query, the SD may find an ANI match in the line number table. The SD may query a service processor if the calling party is subscribed to AT&T but used a resell CIC as a dial around. Also, the calling party may no longer be subscribed to AT&T but the associated ANI could not be de-provisioned from SD. In either case, the *4ESS* switch ignores the SD Response for resell calls. If unnecessary SD and/or SP queries are made for resell calls, the SD and SP will time out and result in wasted resources. If the the number of times that an SD unnecessarily queries a service processor for resell calls is significant, future development may be considered. The future development could prevent the DLN in the *4ESS* switch from generating an SD Query for resell calls while this feature is in the Present Mode of Operation (PMO).

H. Network Call Denial

7.23 Since AT&T is providing feature-less, long-distance transport capability to reseller companies, switch-based Network Call Denial (NCD) is not queried for resell traffic. Since NCD is not queried for resell traffic, additional requirements have not been needed to address the feature interactions between the evolution plans of NCD and this resell feature.

I. Directory Assistance & Directory Link Services

7.24 Directory Assistance can be received by dialing 1+800+CALL+ATT prompt 4, 1+900+555+1212, 1+800+555+1212, or 1+NPA+555+1212 from a switched access location. Directory Link service provides call completion for the number requested when dialing 1+NPA+555+1212. Each of these dialing sequences result in an AT&T branded announcement. The *4ESS* switch will not block 1+NPA+555+1212 for directory assistance for resell traffic as long as we have a valid routing number but no Directory Link Service will be provided for resell traffic.

J. Universal International Freephone Number

7.25 The Universal International Freephone Number (UIFN) allows the calling party to dial a toll free international number. Since AT&T is providing feature-less, long-distance transport capability to reseller companies, international toll free service is blocked for resell calls.

K. Federal Government Services

7.26 AT&T currently provides Government Emergency Telecommunications Service (GETS) and Special Routing Arrangement Service (SRAS) to the Federal Government. These services are identified in the AT&T Network by an NPA of 710. The *4ESS* switch blocks dialed numbers with an NPA of 710 for resell traffic.

8. Input/Output Manual Pages

8.01 The following output Manual Pages are affected by this feature:

REPT:IAOFC	This output message reports an event specified on an **MON:IAOFC** input message trap whose schedule is occurring or has occurred. The data relevant to a call irregularity is displayed.
REPT:IATSG	This output message reports an event specified on an **REPT:IATSG** input message trap whose schedule is occurring or has occurred. The data relevant to a call irregularity is displayed.

800 Service Direct Services Dialing Fix Feature (5252)

18

Contents **Page**

800 Service Direct Services Dialing Fix Feature (5252)

18

1. Feature Description

1.01 The 800 Service Direct Services Dialing (DSD) Fix Feature corrects a situation in which the *4ESS*™ switch played a vacant code announcement rather than the final handling announcement selected by the customer.

1.02 This feature provides a means for the switch to properly handle these calls.

2. Call Flow

2.01 The call flow is as follows:

1. The caller dials 8YY-NPA-XXXX in an attempt to complete an 8YY (DSD)call.
2. The Originating AT&T Switch receives the 8YY call from the LEC.
3. The OAS queries the 2DSD Network Control Point and the 2DSD NCP returns a non-international routing number.
4. The OAS determines that the type of call is Final Handling Treatment (FHT).
5. The OAS looks in the call data field to determine the appropriate final handling treatment.
6. The *4ESS* switch plays the indicated announcement to the caller.

3. Provisioning

3.01 All non-international routing numbers must be provisioned with a call type of FHT.

3.02 The *4ESS* switch announcement code (such as EA1 or SP1) indicating the appropriate announcement must be provisioned in the call data field.

NOTE:
The 191 routing numbers are provisioned in CNRDB/IRAS to point to a (loop around) TSG. The TSG in turn points to the FHT. With this feature, it will be necessary to reprovision all 191 routing numbers that require switch-based final handling treatment with the appropriate FHT (i.e. EA1). If these routing numbers are not reprovisioned, previously used workarounds will still apply.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

7.01 For this feature to work, the following requirements must be met:

- All non-international routing numbers must be provisioned with a call type of FHT.
- The *4ESS* switch announcement code (such as EA1 or SP1) indicating the appropriate announcement must be provisioned in the call data field.
- The *4ESS* must look in the call data field to determine the correct announcement when the call type is FHT
- The *4ESS* switch must play the announcement specified in the call data field.

Ubiquity

7.02 Full ubiquity is not required before turning this feature on.

Turn On/Turn Off Mechanism

7.03 This feature is turned on automatically by software deployment.

8. Input/Output Manual Pages (Not Affected)

Modification to FRF #4867, TCS 3.0 Feature (5578)

19

Contents **Page**

Modification to FRF #4867, TCS 3.0 Feature (5578)

19

1. Feature Description

1.01 This feature provides an additional capability to the Transfer Connect Service 3.0 (TCS 3.0) feature (4867). This new capability allows the Adjunct to send application error and call status information Out-Of-Band (OOB) to any Redirecting Party (RP) that sends OOB redirection requests to the Adjunct.

1.02 This modification also contains new error handling requirements for incorrectly formatted Q.931 FACILITY messages received by the *4ESS*™ switch from the RP.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

Recent Change and Verify (RC/V) Forms Affected

3.01 Refer to FRF #4867 (234-090-213AC, Chapter 8), 4E21 Release 3 Generic for provisioning.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

Error Handling Modification

6.01 In order to conform to industry PRI standards, *4ESS* switch error handling for a Q.931 FACILITY message missing a mandatory Information Element will be changed. Instead of sending a Q.931 FACILITY message indicating "Reject", the *4ESS* switch will have to send a Q.931 FACILITY REJECT message.

7. Transition Considerations(Not Affected)

8. Input/Output Manual Pages (Not Affected)

Software Defined Network Access Via Network Adjunct Platform Feature (5579)

20

Contents **Page**

Software Defined Network Access Via Network Adjunct Platform Feature (5579)

20

1. Feature Description

1.01 The Software Defined Network (SDN) Access Via the Network Adjunct Platform (NAP)
(SDAN) feature allows the NAP to originate an SDN call into the AT&T Switched Network (ASN) over a Small Scale Adjunct (SSA) Primary Rate Interface (PRI) line. The SDAN capability enables the NAP to support an SDN access arrangement. The SDAN allows the NAP to originate SDN calls for multiple customers. On a call by call basis, the ASN can identify the SDN subscriber and provide the appropriate SDN features. This phase requires an SDN access arrangement on a call by call basis.

1.02 The SDAN capability provides an SDN access arrangement between the NAP and ASN. It does not change the SDN service capabilities. The SDN feature processing remains the same for SDN calls originating from a NAP.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording

4.01 The NAP may provide a 3-digit call code to be used on the Automatic Message Accounting (AMA) record.

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

6.01 There is a new Final Handling Code (FHC) for SDN NAP calls that do not have a 10-digit billing number.

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS*™ switches in the network to be running the 4E22 Release 1 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)

Modifications to Software Defined Network (SDN) Network Remote Access (NRA) Using Automatic Speech Recognition (ASR) Feature (5589)

21

Contents **Page**

Modifications to Software Defined Network (SDN) Network Remote Access (NRA) Using Automatic Speech Recognition (ASR) Feature (5589)

21

1. Feature Description

1.01 Modifications have been made to the SDN NRA Using ASR (4557) feature originally introduced in 4E21 Release 1. This chapter repeats the original feature information and notes the modifications with "C's" on the right hand margin. C C C

1.02 The Software Defined Network (SDN)–Network Remote Access (NRA) Using Automatic Speech Recognition (ASR) feature provides greater flexibility in that callers can complete a telephone call by speaking into the handset. The capability to enter digits using a touch-tone key pad already exists.

1.03 This feature enhances the existing SDN–NRA feature. The AT&T Trigger Platform (ATP) provides the means to collect digits using ASR. ATP monitors the call and the Improved Service Announcement and Information Collection (ISAIC) Service Circuit System (SCS) collects the digits after ATP detects a trigger.

1.04 The ASR capability is supported only by *4ESS*™ switches equipped with ATP.

1.05 The SDN–NRA feature allows destination number lengths of up to 18 digits when a caller uses a touch-tone key pad. If the destination number is entered via speech, lengths of 7, 10, and 1+10 digits are allowed.

1.06 The Custom Data Service Unit (CDSU) provides the recognition function. However, all announcements are played by ISAIC SCS via a Service Circuit Unit (SCU). Each CDSU supports 24 ports of simultaneous ASR via 2 T1 connections to an SCU. An Ethernet Local Area Network (LAN) provides communication and control between the SCU and the CDSU.

1.07 Feature 5589 introduces two modifications for the SDN NRA Using ASR feature. C
First, the *4ESS* now reports a disconnect trigger to the ATP for generic action C
processing after playing the NCP Call Denial Announcement. If the ATP has already C
been invoked, the disconnect trigger will initiate a TCAP BEGIN message from the C
4ESS to 2DSA NCP and as a result the caller will be able to make a sequence call. C

1.08 Secondly, the *4ESS* now populates the Set S bit in the CAC parameter only when C
Set S (DTMF) channels are available. C

2. Call Flow

Call Flow Key Points

2.01 The network architecture is illustrated in Figure 21-1. The Custom Data Service Unit (CDSU) provides the recognition function. However, all announcements are played by ISAIC SCS via an SCU. Each CDSU supports 24 ports of simultaneous ASR via 2 T1 connections to an SCU. An Ethernet Local Area Network (LAN) provides communication and control between the SCU and the CDSU.

2.02 An incoming call from the calling party is switched by the *4ESS* switch fabric and hair pinned through the SCU back to the caller (or the called party). Information captured by the CDSU (for example, digits or key words) are reported to the ATP switch by means of report codes.

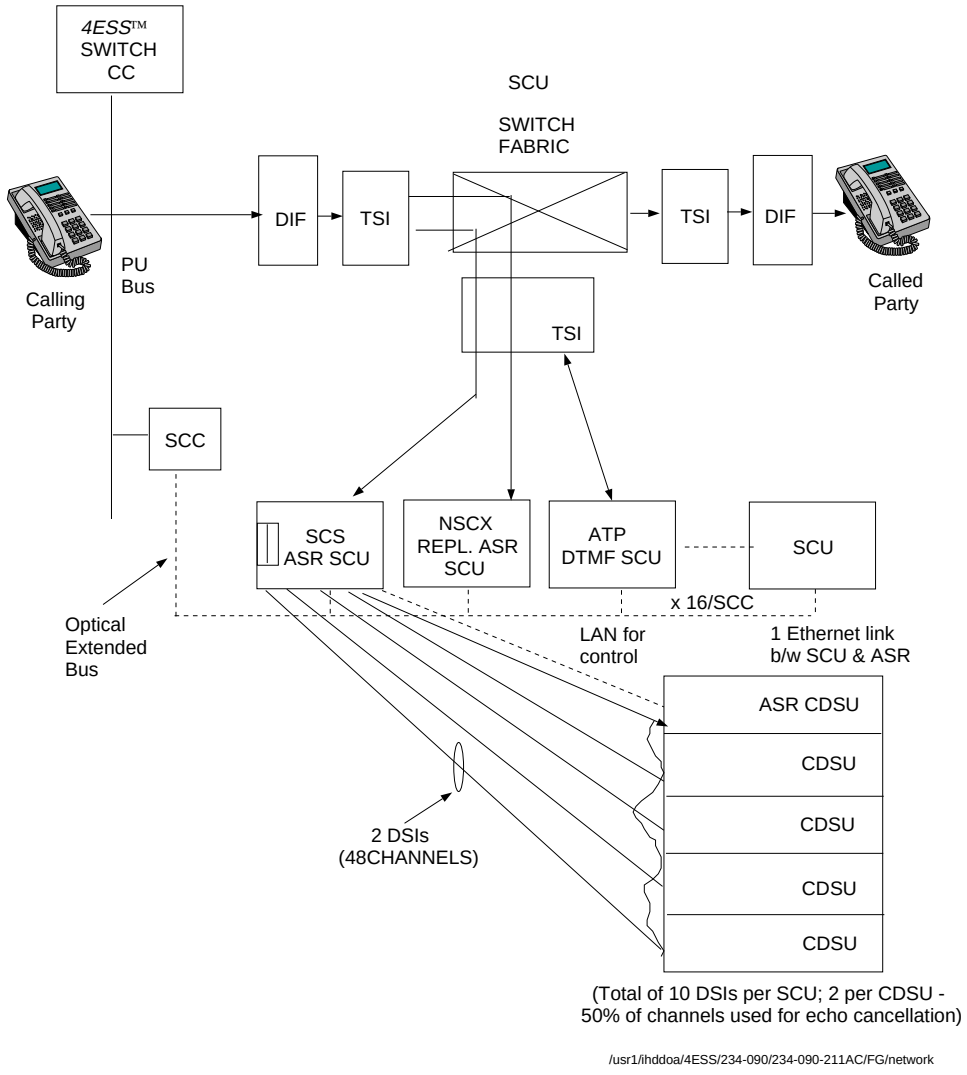


Figure 21-1. Network Architecture

Call Flow Narratives

2.03 The following call flow applies to a customer whose account allows prompting for an authorization code before prompting for a destination number.

1. A customer dials 1-800-NXX-XXX. The End Office (EO) routes the call to the Originating AT&T Switch (OAS). The OAS receives the call and, based on 6-digit translation, queries the INWATS Database (IDB).

2. The IDB returns a Network Routing Number (NRN) in the form 126-WXY-NPA0 to the OAS. The number 126 indicates the Special Services Code (SSC). The OAS receives a response from the IDB and translates the NRN in the POTS domain. Based on the 3-digit (126) translation, the OAS points to the appropriate Multiple Routing Treatment (MRT) Table.

3. When the call arrives at the ATP switch, the NRN is translated in the POTS domain. Based on the 3-digit (126) translation, the ATP switch determines that this is an SDN NRA sequence call.

4. The ATP switch then performs a 10-Digit Global Title Translation (GTT) on the 126 NRN to determine the proper SDN/Network Control Point (NCP).

5. The ATP switch sends a Transaction Capabilities Application Part (TCAP) BEGIN message to the NCP. The Customer Announcement Capabilities (CAC) in this message is set to Announcement Set S. The Node Capabilities, Bit E parameter is set to 1 (indicates ASR is available) and the Supplemental Originating Information (SOI) parameter is populated with a Sequence Call Indicator (SCI) value of 5 (indicates the first call of an ATP sequence call).

   NOTE: Bit E determines if ASR is available (set to **1**). If this bit is set to **0**, ASR is not available.

6. The NCP executes the Customer Account Logic (CAL). The CAL determines if the call is to be blocked based upon the Automatic Number Identification (ANI) lockout fraud control feature. If so, CAL instructs the ATP switch to final handle the call via a TCAP END message. Otherwise, the call continues.

7. The CAL (based on the SOI value and customer account feature description) collects the authorization code (if necessary) and the destination number. The CAL requests the NCP to collect the digits from the ATP switch. The NCP verifies that the switch has the required capabilities (ATP and Announcement Set S). If not, the request is handed off to another *4ESS* switch to collect the digits and invoke ATP.

   CAL indicates that two sets of authorization code strings are to be returned and also indicates the appropriate custom grammar to be used (14-digit or fixed length grammar).

8. The 2NCP sends a CONTINUE message to the ATP switch containing the:

   - Component type = Invoke
   - Operation = Caller Interaction—Play announcement and Collect Digits
   - Mandatory parameters of Customized Announcement (announcement set and announcement ID) and Digit Collection Indicators
   - Optional parameter of Speech Control (I, II, or III).

   If Option Code 1 is to be collected, the Speech Control I field encodes the exact number of digits to collect (from 1 to 15 digits). The Speech Control II field is not used.

   If Option Code 2 is to be collected, the Speech Control II field encodes the exact number of digits to collect (10 or 14 digits only). The Speech Control II field is not used.

9. The ATP switch connects to the SCS (ASR) SCU and plays an announcement to the caller. The text of the announcement is

   Please enter your authorization code.

   After this announcement is played, the caller responds by either entering the authorization code using a touch-tone key pad or responds by speaking the digits.

   If the Caller responds via Touch-tone key pad, the ATP switch collects one authorization code string.

   If ringing occurs, the caller enters a number to indicate sequence dialing.

   If a busy signal is encountered, the ATP switch removes OGT and ICT and tears down the call if the caller hangs up within 6 seconds. However, if the caller enters a number within the 6-second time frame, the ATP switch removes the OGT and sends a TCAP BEGIN message to the 2NCP (dialed number set to zeroes, SCI set to 6, and Bit G of SOI parameter set to 1).

   If the call is denied, the ATP switch terminates the call.

   If the caller responds by speaking the digits, the ATP switch collects authorization code strings.

10. If the authorization code is invalid, the NCP instructs the *4ESS* switch to collect the authorization code again. The new code is sent to the NCP for validation. If the code is still invalid, the NCP instructs the switch to final handle the call. If the code is valid, the call continues.

11. The CAL checks the format of the destination number and determines the billing and routing data, among other things. The CAL instructs the NCP to send a TCAP END message to the ATP switch to invoke ATP for valid calls and to bill and route the call.

12. The ATP is then disabled. Monitoring for both Inband and Out-of-Band triggers is stopped, all timers are cleared, per-call information is deleted, and announcement and digit collection are stopped.

2.04 The following call flow is applicable to SDN NRA-International (NRA-I) calls.

1. The customer dials a toll-free number. The Foreign Administration (FA) switch routes the call to the ASN. It also sends the ANI (if available) and an NRN in the format 143-WXY-CCCZ.

2. The AT&T International Switching Center (ISC) receives the call and translates the NRN in the POTS domain. Based on the 3-digit (143) translation, the ISC points to the appropriate MRT Table.

3. When the call arrives at an ATP switch, the NRN is translated in the POTS domain. Based on the 3-digit (143) translation, the ATP switch determines that this is an SDN NRA sequence call and maps the 143-WXY-CCCZ to a 143-WXY-CCC0 (sets the Z digit to 0).

4. The ATP switch performs a 10-digit GTT on the 143 NRN to determine the appropriate SDN/NCP. From this point, the call flow proceeds the same as the domestic call flow (beginning with Step 5).

3. Provisioning

3.01 Provisioning of the ATP database to support this feature will be done by the CCS Network Administration Center (CNAC).

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

6.01 A new Final Handling Code (FHC) was created for feature 5589. FHC 1975 reports that a request to disconnect and final a SDN-NRA call has been received. C C

7. Transition Considerations

Dependencies

7.01 Feature 4557 depends on the following:

- Feature 4306, ATP, Jr.
- Feature 3172, NXCS Replacement
- Feature 4183, Automatic Speech Recognition, Phase 1.

All three features must be active in the *4ESS* switch before Feature 4557 will work.

Ubiquity

7.02 For Feature 4557 to become operational, *4ESS* switches in the network must be running the 4E21 Release 1 Generic (ATP and ASR active).

7.03 For Feature 5589 to become operational, *4ESS* switches in the network must be running the 4E22 Release 1 Generic. C C

Turn On/Turn Off Mechanism

7.04 Feature 4557 is turned on automatically by software deployment.

7.05 Feature 5589 is turned on automatically by software deployment. C

8. Input/Output Manual Pages (Not Affected)

Set S Dual Tone Multifrequency (DTMF) to Automatic Speech Recognition (ASR) Switching Feature (5591)

22

Contents **Page**

Set S Dual Tone Multifrequency (DTMF) to Automatic Speech Recognition (ASR) Switching Feature (5591)

22

1. Feature Description

1.01 Modifications have been made to the AT&T Advanced 800 ASR Using SCS (4741) feature originally introduced in 4E21 Release 2. This chapter repeats the original feature information and notes the modifications with "C's" on the right hand margin. C C C C

1.02 This feature is an enhancement of the Call Prompter Service on the Service Circuit System (SCS). It will support Automatic Speech Recognition (ASR) for AT&T Advanced 800 (A800) service on the SCS.

1.03 Call Prompter is an interactive announcement service that allows an 800 call to be routed to a specific location based on the caller's TouchTone input. If the caller does not have TouchTone service the call is given default treatment. With the A800 ASR feature, callers may respond by speaking their choice. This is especially important when calls are placed from locations that do not support TouchTone digit entry.

1.04 This feature provides the speech recognition of the following:

- Isolated digits "one" through "nine".
- The digit "zero" and the word "oh" as a synonym for "zero".
- The words "yes" and "no".
- Connected digits formed from the digit set zero, one, two, three, four, five, six, seven, eight, nine, and "oh."

- Telecommunications Device for the Deaf (TDD) characters "0" through "9", and the space bar for hearing impaired callers using the Baudot tone protocol.

1.05 The speech recognition functionality is provided by the Customer Data Service Unit (CDSU), which is part of the SCS. This feature supports talk-thru for isolated and connected digits and word spotting for isolated digits only.

1.06 The CDSU is a speaker-independent recognizer with word spotting capability. The vocabulary can be specified to be a subset of the digits "zero" through "nine", connected digits, the words "yes" and "no", and the word "oh" as a synonym for "zero". Word spotting and rejection capabilities are built into the recognizer to identify key words that appear in phrases and discard utterances that contain no key word at all.

1.07 There are two models that support speech recognition, the segregation model and the overlay model. They differ only in the degree in which they integrate voice and Dual Tone Multi-Frequency (DTMF) recognition capability within customer announcements. The segregation model initially prompts TouchTone users to identify themselves by pressing a key. This segregates the TouchTone from the voice callers and allows announcements to be worded specifically for the targeted group. The overlay model prompts the caller to input his/her selection either by voice or TouchTone entry. The message explaining how the choices may be made asks the caller to either say the number or press a key.

1.08 The Set S DTMF-to-ASR Switching feature (5591) allows the *4ESS*™ switch to reroute a call to an ASR port on ISIAC, if one is available. The feature enables switching a call in ISAIC from Set S DTMF-only channels to Set S ASR/DTMF channels when Set S ASR/DTMF is requested anytime after the call has already been connected to Set S DTMF-only resources. Once the call has been switched, the call must remain on the ASR/DTMF channel for the remainder of the call, which can accommodate any requests that follow. Those requests can be the following: C

- Announcement-only requests (for example, Enroute or Final Handling) C
- DTMF-only Play Announcements/Collect digits (PA/CD) requests (for example, A800 Call Prompters) C
- ASR or DTMF PA/CD requests (for example, A800 Call Prompters) C
- ASR PA/CD requests (for example, A800 Call Prompters) C

2. Call Flow

2.01 The A800 ASR feature provides for two similar call flow scenarios based on which model, segregation or overlay, the customer chooses. The following illustrates the common call flow that both use:

1. A caller dials 1+800-NXX-XXXX.
2. The call is routed by the Local Exchange Carrier (LEC) to an Originating AT&T Switch (OAS).
3. The OAS starts a Transaction Capabilities Applications Part (TCAP) Begin message containing the dialed number, the caller's three digit Numbering Plan Area (NPA) or ten digit Automatic Number Identification (ANI), and the node capabilities to the 2 Direct Services Dialing (DSD).
4. The OAS indicates availability of Network Services Complex (NSCX) ASR Service Circuit Unit (SCU) by setting bit E of the TCAP Node Capabilities parameter to 1. If NSCX ASR SCU is not available, bit E is set to 0. The Customized Announcement Capabilities (CAC) parameter is sent if NSCX Replacement DTMF SCU ports are available.
5. The 2DSD Network Control Point (NCP) uses the dialed number received in the TCAP Begin message to index the Dialed Number Translation Table and identify the customer account.
6. The 2DSD NCP uses Customer Accounting Logic (CAL) along with the customer account, dialed number, time of day, and day of week to execute the routing plan.
7. During the execution of the routing plan, the call flow differs depending on which model the customer has chosen.

3. Provisioning

3.01 Provisioning is done to add, modify, and delete customer records and custom announcements. The *4ESS* switch is not involved in this provisioning. There are two National Services Support Centers that update these records and announcements. The Engineering Network Administration Center (ENAC) and the Advanced Feature Service Center (AFSC) update the Improved Service Announcement and Information Collection (ISAIC) platform-based Advanced 800 service.

4. Recording

4.01 The *4ESS* switch populates the "Speech Recognition Count" and "TDD Recognition Count" of structures 00903 and 00904 with the value 0 if the ASR1 field value in the Supplemental A800 Billing Data Parameter in TCAP End message is set to 0.

4.02 If the value is set to 1 only the "Speech Recognition Count" of structures 00903 and 00904 are populated.

4.03 If the value is set to 2 only the "TDD Recognition Count" of structures 00903 and 00904 are populated.

5. Network Management

5.01 Currently, when the 2NCP experiences a resource shortage, it generates exception messages in real time and exception summary messages at the end of every five minutes. Calls that receive voice input from the caller generally use more time, filling up the buffers and causing them to run out of resources and generate exception messages. These exception messages will no longer be generated.

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Hardware Dependencies

7.01 The CDSU must be grown in the ASR frame. Procedures for accomplishing this growth are contained in Task Oriented Practice (TOP) 234-153-060AC, *4ESS*™ *Switch, SCS Grow/Add*.

Dependencies on Other Network Components

7.02 Feature 4741 depends on the following:

- Feature 4557, SDN-NRA Using ASR
- Feature 4306, ATP, Jr.
- Feature 3172, NXCS Replacement
- Feature 4183, Automatic Speech Recognition, Phase 1.

All four features must be active in the *4ESS* switch before Feature 4741 will work.

Ubiquity

7.03 It is necessary for all *4ESS* switches in the network to be running the 4E21 Release 2 generic for the 4741 feature to be fully operational.

7.04 It is necessary for all *4ESS* switches in the network to be running the 4E22 Release 1 generic for the 5591 feature to be fully operational. C C

Turn On/Turn Off Mechanism

7.05 Feature 4741 is turned on automatically by software deployment.

7.06 Feature 5591 is turned on automatically by software deployment. C

8. Input/Output Manual Pages (Not Affected)

Calling Party Number Anomaly Reports Feature (5594)

23

Contents **Page**

Calling Party Number Anomaly Reports Feature (5594)

23

1. Feature Description

1.01 The FCC mandated that all interexchange carriers with SS7 connectivity carry and deliver the Calling Party Number (CPN) and the Initial Address Messages (IAMs) delivered by a Local Exchange Carrier (LEC). AT&T complies with this requirement. However, there have been instances where AT&T received IAMs without the CPN. In those cases, AT&T was unable to deliver the CPN to the terminating LEC.

1.02 This feature is needed to determine how often IAM messages are received from non-AT&T switches without the CPN. This includes LECs, LEC resellers, and PBXs directly connected via ISUP. Measurements will be made on a TSG basis.

2. Call Flow (Not Affected)

3. Provisioning

3.01 The following item has been created and administered through provisioning to ensure successful implementation of this feature.

A. Recent Change Form 800

3.02 Recent Change Form 800 is used to populate data required to provide Autonomous Reports. Refer to the Maintenance/Troubleshooting section of this document.

4. Recording (Not Affected)

5. Network Management (Not Affected

6. Maintenance/Troubleshooting

Autonomous Reports

6.01 Autonomous reports are issued to the Input/Output (IO) channel specified in the ODA channel item described below. If the channel is not specified in the ODA word, the reports will be issued to the 1B Maintenance Channel. Autonomous reports are printed for those Trunk Subgroups whose counts exceed the threshold item described below. The threshold item is defaulted to zero.

6.02 The report is entitled CPN ANOMALY REPORT. This report is issued in segments of up to 20 Trunk Subgroup Counts. Each segment is numbered and the final segment indicates that completion has occurred.

6.03 A single ODA word contains all of the feature control data. The layout is as follows:

- Address in 4E22 Generic - O(7155557)
- Bit 23 = feature on/off bit, 0=off, 1=on
- Bit 22 = request for four hour autonomous reports, 0=off, 1=on
- Bits 17-10 = 1B channel to which autonomous reports will be sent
- Bits 09-00 = threshold value. Autonomous counts will be output if they exceed this value.

6.04 This word will be preserved from 4E21 to 4E22 and later Generics via retrofit mapping.

6.05 Recent Change 800 (Absolute Recent Change) should be used to populate this data.

Interaction of Autonomous and Demand Reports

- If a demand or an autonomous task is currently being processed, a request for a demand task will receive an "RL" retry-later indication to the requesting channel.

- If a demand task is requested, other than the TSGN request and no data is present, the response will be an "NG" no=good indication to the requesting channel.
- If a demand task is currently being processed and the time has arrived for an autonomous report to begin, the demand task will be aborted and the autonomous task will begin.

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS*™ switches in the network to be running the 4E22 Release 1 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

7.02 This feature is turned on using Recent Change Form 800.

8. Input/Output Manual Pages

Demand Messages

8.01 A set of demand messages has been created to allow for various types of data acquisition related to this feature. Each command is described below. These commands will function regardless of the state of the on/off bit.

8.02 The commands are as follows:

- **OP:DCONN 400!**

  This command outputs the entire list of TSG Counts which have exceeded a threshold of zero. The output is directed to the requesting channel.

- **OP:DCONN 401!**

  This command outputs the entire list of TSG counts which have exceeded a threshold of zero. Also, all TSG counts, including the total office count, will be cleared. The output is directed to the requesting channel.

- **OP:DCONN 402!**

  This command outputs all TSG counts which have exceeded the ODA specified threshold. The output is directed to the requesting channel.

- **OP:DCONN 403,NUM x!**

  This command outputs all TSG counts which have exceeded the threshold input as the NUM option. The threshold value is a number in the range of 0-4095. The output is directed to the requesting channel.

- **OP:DCONN 404,TSGN x!**

  This command outputs the counts for the TSG input as the TSGN option. The TSGN value is a number in the range of 0-4095. The message will be output even if the count is zero. If the TSG is unassigned, only the message header will be output. The output is directed to the requesting channel.

- **STOP:OP;DCONN 400!**

  This command terminates the printing of any of the autonomous or any of the demand tasks. A message terminated in this way will be indicated by the phrase "STOPPED" in the message header. The response to the STOP message is an immediate "OK".

NOTE:
If this command is issued during the printing of the 24 hour report or the **OP:DCONN 401** demand message, all TSG counters may not be zeroed due to termination of processing.

Integrated Services Digital Network Called Party Number Protocol Upgrade Feature (5613)

24

Contents **Page**

Integrated Services Digital Network Called Party Number Protocol Upgrade Feature (5613)

24

1. Feature Description

1.01 The value "unknown" in the Type of Number field of the Called Party Number (CPN) Information Element (IE) in a Q.931 Setup message is an unrecognized value of a mandatory field of a mandatory IE. If that value appeared, the *4ESS*™ switch would clear the call.

1.02 This feature provides capabilities to accept the CPN IE in the Q.931 Setup message with the Type of Number and Numbering Plan fields both coded as "unknown", and to interpret the digits contained in the Called Party Number IE as if they had been received with a Type of Number/Numbering Plan identification code as "National" and "ISDN", respectively.

2. Call Flow

Call Flow Key Points

2.01 The *4ESS* switch will accept the "unknown/unknown" encoding for the Q.931 CPN IE Type of Number and Numbering Plan identification, and interpret the number digits of the called party as if the CdPN IE Type of number and Numbering Plan identification fields were coded "National" and "ISDN", respectively.

2.02 The maximum acceptable length of the Called party number IE sent to the *4ESS* switch is 20 octets (instead of 17, as previously supported).

2.03 The *4ESS* switch will **not** send the "unknown/unknown" encoding for the Q.931 CPN IE Type of Number and Numbering Plan identification, but instead, encodes the Type of Number and Numbering Plan identification per existing requirements.

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

7.01 This feature interacts with existing ISDN capabilities, in that the *4ESS* switch currently differentiates between public and private numbers arriving via ISDN PRI using the Type of number and Numbering Plan identification fields of the Called Party number IE. When both are set to "unknown", the *4ESS* switch must be able to apply procedures currently used for SDN trunk subgroups to differentiate between private and public numbers.

Ubiquity

7.02 It is not necessary for all *4ESS* switches in the network to be running the 4E22 Release 1 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

7.03 This feature is turned on automatically by software deployment.

8. Input/Output Manual Pages (Not Affected)

ODA Datalinking Software Tool Enhancements Feature (5704)

25

Contents **Page**

ODA Datalinking Software Tool Enhancements Feature (5704)

25

1. Feature Description

1.01 This feature provides enhancements to the ODA Datalinking (ODAD) software, providing tools which reduce or eliminate transmission errors. This ensures that switch data is delivered error free and in a timely manner.

1.02 An application level hashing process has been added to the ODAD link control software. This hashing process uses a hold-and-verify method over a pre-defined number of packets, as shown below.

- Every 15 data packets are received and held.
- The hash is computed on both ends of the transmission.
- The data within the packets is validated.
- If there is no mismatch detected, the data contained within the packets is written as valid.
- If there is a mismatch detected, the same packets are re-transmitted.

1.03 This hashing process has been added to the SEND, FETCH, and UPLOAD capabilities within both the Master (OLP version) and SLAVE (field *4ESS*™ switch version) of the ODAD software.

2. Call Flow (Not Affected)

3. Provisioning

3.01 The SEND, FETCH, and UPLOAD capabilities within both the Master (OLP version) and Slave (field *4ESS* switch version) of the ODAD software have been enhanced to guarantee error free delivery of data.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

7.01 During transition, the off-line processor (OLP) must keep both old and new versions of the OLP version (MODAD) to interact with each.

Ubiquity

7.02 Full ubiquity is not required before turning this feature on.

Turn On/Turn Off Mechanism

7.03 This feature is turned on automatically by software deployment.

8. Input/Output Manual Pages (Not Affected)

Extend ACM Timer for CCS7 Feature (5724)

26

Contents **Page**

Extend ACM Timer for CCS7 Feature (5724)

26

1. Feature Description

1.01 Prior to the Extend Address Complete Message (ACM) timer for CCS7 feature, the ACM timer value used by the *4ESS*™ switch was 20 seconds.

1.02 That interval was shorter than that used in some other switches, which used longer or provisionable ACM timer values. The shorter ACM timer value used by the *4ESS* switch sometimes resulted in lost calls, especially in the case of calls to cellular carrier networks, which can experience longer setup times at the cellular switch before returning the ACM.

1.03 This feature allows the value for the ACM timer used by the *4ESS* switch to be either 20 seconds or 25 seconds, depending on whether the feature is provisioned as off or on for the switch.

2. Call Flow (Not Affected)

3. Provisioning

Recent Change and Verify (RC/V) Forms Affected

A. RC Form 809

3.01 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 26-A gives the information needed to populate form 809 with the ON/OFF flags.

Table 26-A. On/Off Flags For ACM Timer for CCS7

809 Form Entry				
FEATURE ITEM	**ON/OFF**	**Populates ITEM**	**With**	**Checks**
PF16	ON	OD4PF16	4ODFB_ON	none
	OFF		4ODFB_OFF	none

4. Recording (Not Affected)

5. Network Management (Not Affected

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS* switches in the network to be running the 4E22 Release 1 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

7.02 This feature can also be turned on by and absolute word change.

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

- Structure: OD4OFCCOPY
- Core address: 6732165
- Word: 1
- Size: 1
- Displacement: 15
- On: 1
- Off: 0.

8. Input/Output Manual Pages (Not Affected)

Abbreviations and Acronyms

A

A800
AT&T Advanced 800

AAC
Acculink Access Controller

ABC
Adjunct Based Capability

AC
Area Code

ACM
Address Complete Message

ACMS
Access Capacity Management System

AFSC
Advanced Feature Service Center

AMA
Automatic Message Accounting

ANI
Automatic Number Identification

ANI-TT
ANI Trigger Table

ANSER
AT&T Network Servicing

AP
Attached Processor

AP
Automatic Provisioning

API
Attached Processor Interface

APS
Attached Processor System

ASN
AT&T Switched Network

ASR
Access Service Request

ASR
Automatic Speech Recognition

ASSET
Advanced Switchable Signaling and Echo Canceling Terminal

ASTN
Alternate Signaling Transport Network

ATP
AT&T Trigger Platform

B

BCS
AT&T Business Communications Service

BILLDATS
Billing Data Transport System

C

CAC
Customized Announcement Capabilities

CAL
Customer Account Logic

CAMA
Centralized Automatic Message Accounting

CAT
Consolidated Access Traffic

CCITT
Consultative Committee for International Telephone and Telegraph

CCS
Common Channel Signaling

CCS7
Common Channel Signaling 7

CCTT
CIC Code-Table Trigger

CDID
CCS Design and Implementation District

CDR
Call Detail Recording

CDRP
Call Detail Recording Platform

CDSU
Customer Data Service Unit

CED
Channel Encryptor/Decryptor

CFIM
Common Formatted Irregularity Messages

CGF
Carrier Group Failure

CIC
Carrier Identification Code

CIM
Clear Indication Message

CINTAS
CCS Network Total Administration System

CIP
Carrier Information Parameter

CMDS II
Centralized Message Data System

CMF
Common Master File

CNFS
CCIS Network Forecasting System

CNI
Common Network Interface

CNRDB
Common Network Routing Database

COS
Class of Service

CPAM
CCS7 Performance and Alarm Monitoring

CPN
Called Party Number

CPP
Card Provisioning Process

CS
Call Store

CSC
Circuit Selection Characteristic

CSCR
Customer Specific Call Routing

CSPM
Carrier Solutions Project Manager

D

D-ACC
Dynamic-Automatic Congestion

DARICS
Data Acquisition Reports Integrated Communications System

DARICS
Data Acquisition Reports and Integrated Communications System

DE
Distant Entity

DEMS
Dynamic Engineering Mechanized System

DIF
Digital Interface Frame

DIU
Digital Interface Unit

DLN
Direct Link Node

DN
Destination Number

DN-TT
Destination Number Trigger Table

DNHR
Dynamic Non-Hierarchical Routing

DNST
Dialed Number Service Type

DOC
Dynamic Overload Control

DS1
Digital Signal-level 1

DS3
Digital signal-level 3

DSCH
Dual Serial Channel

DSD
Direct Services Dialing

DSI
Digital Services Interface

DTMF
Dual Tone Multifrequency

DTO
Dedicated Trunk Sub-group Option

DUS
Data Unit Selector

E

EA
Equal Access

EAI
Emergency Action Interface

EAMF
Equal Access Multi-Frequency

EAR
Emergency Alternate Routing

EBAF
Extended Bellcore AMA Formats

ECOS
End-to-End Class-of-Service

EIN
Ethernet Interface Node

ENAC
Engineering Network Administration Center

EPIC
Enhanced Peripheral Interface Controller

ERAP
Error Analysis Program

ERPI
ECOS Routing Pattern Identity

F

FAR
Forecast Access Requirements

FHC
Final-Handling Code

FITR
Forced Intertoll Routing

FPAS
Facility Performance Analysis System

G

GEN
Generic

GETS
Government Emergency Telecommunications Service

GFMS
Global Fraud Management System

GNS
Go/No/go Screening

H

HNPA
Home Numbering Plan Area

I

I/O
Input/Output

IAM
Initial Address Message

IC
Interexchange Carrier

ICM
Intertoll Capacity Management

ICSC
Interexchange Carrier Service Center

IE
Information Element

II
Identification Indicator

ILDS
International Long Distance Service

iPCC
Individual Per-Call Control

IPP
Intertoll Planning & Provisioning

IRAS
Integrated Routing Assignment System

IRN2
Integrated Ring Node 2

ISAIC
Improved Service Announcement and Information Collection

ISC
International Switching Center

ISDN
Integrated Services Digital Network

ISUP
ISDN User Part

ISUP
Integrated Services Digital Network User Part

ISUP-NI
ISDN User Part Network Interconnect

ITLF
Intertoll Trunks and Load Forecasting

ITN
Integrated Test Network

J

JIP
Jurisdiction Information Parameter

L

LAM
Leave-A Message

LAN
Local Area Network

LDS
Long Distance Service

LEC
Local Exchange Carrier

LIAM
Local Infrastructure Access Management

LNP
Local Number Portability

LRN
Location Routing Number

LSP
Local Service Provider

LTS
Long Term Storage Tape

M

M&P
Methods and Procedures

MCC
Master Control Console

MCT
Multiple Carrier Treatment

MDLRS
Mechanized Design Layout Record System

MF
Multifrequency

MMT
Meet-Me Teleconferencing

MOU
Minutes of Use

MRT
Multiple Routing Treatment

MSD
Market Service Description

MUP
MCC and Utility Processor

N

NAI
Network Access Interrupt

NAMACC
National Automatic Message Accounting Control Center

NANP
North American Numbering Plan

NAP
Network Adjunct Platform

NCC
Network Control Center

NCD
Network Call Denial

NCM
Network Capacity Management

NCP
Network Control Point

NE
Network Element

NEMOS
Network Management Operations System

NESAC
National Electronic Switching Assistance Center

NFSG
Network Field Support Group

NI
Network Interconnect

NOC
Network Operations Center

NOTIS-III
Network Operations Trouble Information System-III

NP
Node Processor

NPA
Numbering Plan Area

NRA
Network Remote Access

NRA
Network Routing Automator

NRO
Network Routing Orders

NSA
Network Services Automator

NSCX
Network Services Complex

NSP
Network Services Position

NWM
Network Management

O

OAS
Originating AT&T Switch

ODA
Office Data Administration

ODAD
ODA Datalinking

OLI
Originating Line Identity

OLP
Off-Line Processor

ONAC
Operations Network Administration Center

ONPA
Originating Numbering Plan Area

OOB
Out-Of-Band

OSPS
Operator Service Position System

OSS
Operation Support System

P

PCP
Positive Call Processing

PECC
Product Engineering Control Center

PMO
Present Mode of Operation

PRD
Product Release Document

PRI
Primary Rate Interface

PRT
Proportional Routing

PS
Program Store

PVN
Private Virtual Network

PZM/IMP
Predictive Zero Maintenance/Integrated Maintenance Platform

Q

QH
Quiet Hear

R

RBOC
Regional Bell Operating Companies

RC
Recent Change

RC/V
Recent Change/Verify

RCLI
Recent Change Library Program

RDB
Routing Data Block

RDBI
Routing Data Block Index

RICS
Recorded Information Collection System

RNR
Robust Non-Hierarchical Routing

RP
Redirecting Party

RPI
Route Pattern Identity

RSLDS
Long Distance Resell

RTNR
Real Time Network Routing

S

SAFER
Split Access/Flexible Egress Routing

SAST
System Audit of Stores using Tape

SAWS
System Audits of Writable Store

SCS
Service Circuit System

SCSI
Small Computer System Interface

SCU
Service Circuit Unit

SD
Segmentation Directory

SDAN
SDN Access via NAP

SDN
Software Defined Network

SDNA
Software Defined Network Access

SDX
Subsequent Digit Index

SII
Service Identification Indicator

SIN
SCSI Interface Node

SKSP
Selective Key Service Protection

SNAP
Signaling Network Administration Platform

SNAS
Signaling Network Analysis System

SNOW-R
Service NOW - Routing

SNOW-T
Service Now Trunking

SNPA
Served Numbering Plan Area

SOFEA
Servicing, Ordering, Forecasting Expert Advisor

SPS
Signal Processing Systems

SR
System Reinitialization

SRAS
Special Routing Arrangement Service

SS7
Signaling System 7

SSA
Small Scale Adjunct

SSD
Single Source Data

SST
Signaling Service Type

STAMPS
System for Test Access and Maintenance of Protocol-based Services

STP
Signaling Transfer Point

T

TAS
Terminating AT&T Switch

TC
Transport Capability

TCAP
Transaction Capabilities Application Part

TCS
Transfer Connect Service

TDAS
Traffic Data Administration System Tape

TDD
Telecommunications Device for the Deaf

TFEDS
Toll Fraud Early Detection System

TLP
Trouble Locating Procedure

TNM
Total Network Management

TNPA
Terminating Numbering Plan Area

TNS
Transit Network Selection

TOFC
Terminating Office Code

TOP
Task Oriented Practice

TOPAS
Testing, Operations, Provisioning, and Administration

TOSL
Trunk Out of Service List

TPM
Traffic and Plant Measurements

TRN
Trunk Group Rating Number

TRS
Telecommunications Relay Service

TSG
Trunk Subgroup

TSI
Time Slot Interchange

TTM
Trunk Type Modifier

TUC
Tape Unit Controller

TWRP
Tape Writing Program

U

UIFN
Universal International Freephone Number

USDS
Universal Subscriber Data Structure

USEC
Universal Services Echo Canceler

UTC
Universal Treatment Codes

V

VAS
Via AT&T Switch

X

XTSI
Expanded Time Slot Interchange