Lucent Technologies
Bell Labs Innovations

4ESS™ Switch
Product Release Document

4E23 Release 1 Generic

234-090-231AC
Issue 1
January 1998

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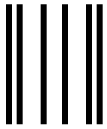

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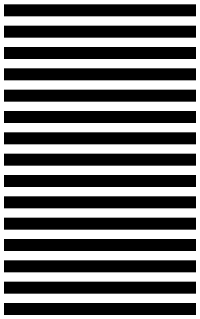

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Contents Page

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**

Contents Page

Contents **Page**

Contents **Page**

Tables

Contents **Page**

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 4E23 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 4E23 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 4E23 Release 1 Generic contains 29 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: *Attached Processor System Real Time Reliable 21.17 Upgrade Feature (478)*

This feature provides a software upgrade for the *4ESS*™ switch Attached Processor System (APS) Operating System (OS) software from Real Time Reliable (RTR) 21.7 to RTR 21.17.

Chapter 2: *Trunk Maintenance Enhancements Feature (496)*

This feature provides enhancements to 3 trunk maintenance messages. The enhancements aid field support organizations and the National Electronic Switching Assistance Center (NESAC).

Chapter 3: *4ESS*™ *Switch Header Validation Feature (505)*

This feature is the result of team study findings that identified a weakness in the Interprocess Message Switch (IMS) architecture that caused long outages on the Number 2 Signal Transfer Point (2STP) in the field. To improve the efficiency and capability of the Common Network Interface (CNI) ring, the team recommended improvements which this feature implements.

Chapter 4: *Segmentation Directory - Phase 2 Feature (4880)*

This feature continues the migration of ASN services to the SD Database Architecture. Phase 2 concentrates on migrating customers out of the *4ESS* switch ANI Trigger Tables.

Chapter 5: *Domestic End to End Class of Service (DECOS) Feature (4904)*

This feature provides the capability for customers to specify how the trunk capacity between the *4ESS*™ switch and a Local Exchange Carrier (LEC) switch (end office or access tandem) or between the *4ESS* switch and the customer switching equipment should be allocated for different services.

Chapter 6: *Positive Look Up in Windowed Call Store Feature (5060)*

The Positive Look Up tables are being moved to Windowed Call Store with the release of this feature. This move will allow the tables to grow to full capacity and free up memory in Main Call Store.

Chapter 7: *Network Support for 8YY Toll-Free NPAs Feature (5123)*

This feature is an extension of the 800 Number Exhaust Relief Feature (4656), which prepared network components to support additional toll-free Numbering Plan Area (NPA) numbers in 4E20 Release 4. Because of time constraints in effect when Feature 4656 was deployed, not all network components were prepared to support the new NPAs. As a result, the network could provide support for only NPAs 888 and 877 (in addition to 800) at that time. This feature provides toll-free NPA support for all network components. In addition, this feature provides changes to I800 calls that terminate to Stentor in Canada.

Chapter 8: *II Digits/Service Category Fraud Prevention Feature (5129)*

This feature allows calls routed to the *4ESS*™ switch to be blocked based on information that includes the call's II (Information Indicator)/OLI (Originating Line Information) value and the call Service Category (SC).

Chapter 9: *Positive Look Up TOols and Enhancements Feature (5163)*

This feature introduces tools to detect and diagnose call blocking in the *4ESS*™ switch. The tools identify invalid linkages and supply enough information so that the problems can be solved.

Chapter 10: *Carrier-Solutions Carrier Identification Code (CIC) Based Determinations Update Feature (5198a)*

This feature has been assigned to control additional testing in the 4E23 Release 1 Generic. The feature provides a new YES/NO Trunk Sub-Group (TSG) indicator, new Information Indicators (IIs), new Originating Line Information (OLI) indicators, and it adds a new field to the Country Code Conversion Translator if RESELL applies to the country code.

Chapter 11: *4ESS*™ *Switch 3B21D Attached Processor System Upgrade Feature (5222)*

This feature provides a new 3B Processor (3B21D) that is used as the Attached Processor System (APS) for the *4ESS*™ switch.

Chapter 12: *Interim D-Channel Expansion Feature (5361)*

This feature increases the number of D-Channel terminations in *4ESS*™ switches by equipping additional High Density Ring Node (HDRN) cabinets (maximum of 4) in the existing Common Network

Interface (CNI) ring.

Chapter 13: *Project Radar Phase 2 Feature (5532)*

This feature provides Phase 2 of a new AT&T Directory Information Service that offers customers the ability to get information other than telephone numbers for given names and addresses. Project Radar is planned to evolve into a long-term Directory Assistance (DA) service that will address both long distance and local DA services. It will also include Consolidated Access Traffic and Segmentation Directory capabilities.

Chapter 14: *Message Header Reduction for the 4ESS™ Switch Attached Processor Interface (API) Capacity Feature (5711)*

This feature increases the message throughput of the *4ESS™* switch Attached Processor Interface (API) by reducing the effective "intra-switch" length of the messages sent through it. It makes no changes to the layout or content of the corresponding external formats.

Chapter 15: *Circuit Selection Capabilities (CSCI) Recording Feature (5816)*

This feature allows the Intertoll Trunk/Load Forecast (ITLF) to automate the forecast of voice enhancement-free traffic and trunking. Prior to this feature, this forecast procedure relied on a manual process, which will now be eliminated.

Chapter 16: *Announcement Set D on the Integrated Services Announcement and Information Collection Feature (5844a)*

This feature defines the measurements for Announcement Set D on the Integrated Services Announcement and Information Collection (ISAIC) platform. The following reports are affected:

- Traffic and Plant Measurements
- On-Site Operations
- Traffic Data Administrative System.

Chapter 17: *Code Group Restructure Feature (5898)*

Once this feature is activated, the call type indicators allowed in the AD3 field of Code Grouping forms will increase to 12 bits.

Chapter 18: *4ESS™ Switch Nodal Egress Sequential Trunk Hunt Feature (5915)*

This feature provides two new trunk hunt options for those Business Market Division (BMD) Customers with direct T1.5 connections from their Private Branch Exchange (PBX) to the AT&T Switched Network.

Chapter 19: *Expansion of 4ESS™ Switch OSPS Access ID Table Feature (5917)*

This feature provides for the expansion of the Automatic Number Identification/Trunk Rating Number/True Billing Numbers (ANI/TRN/TBNs) that can be provisioned in the *4ESS* switch Operator Services Position System (OSPS) Access table and also provides for the expansion of the number of OSPS IDs that can be provisioned in the OSPS ID table.

Chapter 20: *Originating Carrier Terminating Country Pair (OCTCP) and Carrier Identification Code (CIC) Table Enhancements Feature (6072)*

This feature enables the operation system to provision 1024 entries in each *4ESS*™ switch and Gateway OCTCP Table. The feature also expands the number of unique values supported by the *4ESS* switch for the TNS TYPE in the CIC Table from eight unique values to sixteen unique values.

Chapter 21: *Additional Support Capabilities for 4E Local for Nodal Customers Phase 2 Feature (6142i)*

This feature provides additional support capabilities for the AT&T Digital Link feature (5371), introduced in the 4E22 Release 3 Generic, by updating the On-Site Operations Report (OSOR) format to include the Local Service Provider (LSP) output report of seizure counts as a separate item. The new measurement of the Machine Load Service Summary (MLSS) OSOR is planned for a future release.

Chapter 22: *4ESS™ Switch CMS/ESS Audit Enhancement Feature (6156)*

This feature provides an enhancement to the output data that is sent to the Testing, Operations, Provisioning and Administration System (TOPAS), or to CONNECT VU, in response to the AUD:TRKGRP message with the options of CAR, TSG and TSG/CAR. The message outputs the status of each trunk in the Trunk Sub-Group as a letter code.

Chapter 23: *Multiple Carrier Treatment Expansion Feature (6363)*

This AT&T proprietary feature identifies carriers and routing treatment in the multi-carrier environment. The number of Multiple Carrier Treatment (MCT) tables has almost reached their maximum number allowed because of growth in call types over the past few years. In order to support new services and features, the number of MCT tables has increased from 255 to 1023.

Chapter 24: *Project Radar Early Disconnect Feature (6468)*

This feature prevents double billing when a caller requests information using Directory Assistance, but hangs up before receiving the listings (early disconnect).

Chapter 25: *Support for Go/No Go Screening (GNS) Call Type for ECOS Feature (6483)*

This feature provides support for Go/No Go Screening (GNS) for Switched Digital International (SDI) transit calls, so that AT&T can selectively provide or deny service to different foreign Telecommunications Administrations (TAs). This enhances the capabilities provided by the End-To-End Class of Service (ECOS) Feature (3142), which was introduced in 4E20 Release 1.

Chapter 26: *Switch Solution for Software Defined Network (SDN) and 1 + Directory Link (DL) Feature Interaction Modification Request (MR) Feature (6617)*

This feature is a Modification Request (MR) for the Software Defined Network (SDN)-10288 Access to SDN Feature (3857), which was introduced in 4E21 Release 4.

Chapter 27: *Ignore Calling Party Number on International Toll Free Calls Feature (6638)*

This feature is a Modification Request (MR) for the Inbound International 800 Separation of Country Code from Network Routing Number Feature (3957), which was introduced in 4E18 Release 3, and the Inbound International 800 CSR and Enhanced Call Origination Feature (4785), which was introduced in 4E21 Release 4.

Chapter 28: *MR to Payphone Compensation—Phase II Feature (6665)*

This feature causes the *4ESS*™ switch to send a call to an Out of Band (OOB) announcement, rather than a "fast busy", when the payphone blocking announcement has to be played and the switch is not able to access Improved Service Announcement and Information Collection (ISAIC) sets S, B, or D.

Chapter 29: *Release Summary—4E23 Release 1 Generic*

This chapter summarizes several aspects of the features in this document. This chapter identifies Growth and Retrofit documents resulting from features in the current release; new, changed, or deleted input and output messages; Operation Support Systems impacts of the release; and new or changed alarms. The final section tells how each feature is turned on and off.

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.

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Attached Processor System Real Time Reliable 21.17 Upgrade Feature (478)

1

Contents **Page**

Attached Processor System Real Time Reliable 21.17 Upgrade Feature (478)

1

1. Feature Description

1.01 This feature provides a software upgrade for the *4ESS*™ switch Attached Processor System (APS) Operating System (OS) software from Real Time Reliable (RTR) 21.7 to RTR 21.17. This software upgrade is consistent with the 4E23R1 and 4AP_16 generic loads. The plan to replace the 3B20D processors in the *4ESS* switch with a 3B21D processor requires maintaining the latest APS software generic current with the latest RTR OS release and build environment.

1.02 The requirement for the 3B21D processor platform transparency is covered in this document under Feature 5222, *4ESS*™ Switch 3B21D Attached Processor System Upgrade.

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 4E23 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)

Trunk Maintenance Enhancements Feature (496)

2

Contents **Page**

Trunk Maintenance Enhancements Feature (496)

2

1. Feature Description

1.01 This feature provides enhancements to 3 trunk maintenance messages. The enhancements, which will aid field support organizations and the National Electronic Switching Assistance Center (NESAC), are listed in Table 2-A.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

6.01 This feature provides enhancements to 3 trunk maintenance messages, as shown in Table 2-A.

Table 2-A. Enhancements to Trunk Maintenance Messages

Trunk Maintenance Message	Enhancement
VER:TRKNAME	Prints the available data for unassigned trunk cases when the Trunk Scanner Number (TSN) is non-zero
CLR:TRKSTAT	Allows the Test Control Area (TCA) as an input option for this message
OP:TSGHC	Allows the TSN, the Trunk Appearance Number (TAN) or the Octal Trunk Appearance Number (OTAN) as input options for this message.

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS*™ switches in the network to be running the 4E23 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 Manual Pages were modified to support this feature:

- **OP:TSGHC** (Input and Output)
- **CLR:TRKSTAT** (Input).

4ESS™ Switch Header Validation Feature (505)

3

Contents **Page**

Contents **Page**

4ESS™ Switch Header Validation Feature (505)

3

1. Feature Description

1.01 This feature reduces the frequency of ring outages and reduces the total system down time. The feature is the result of team study findings that identified a weakness in the Interprocess Message Switch (IMS) architecture that caused long outages on the Number 2 Signal Transfer Point (2STP) in the field. To improve the efficiency and capability of the Common Network Interface (CNI) ring, the team recommended an improvement that this feature implements. This improvement provides header validation of hardware control messages and all general broadcast and take messages.

1.02 In the past, unintentional corruption of an IMS header occurred while a message was waiting to be written to the CNI ring. This caused a software message to look like a hardware control message which caused unintended hardware state changes in one or more CNI ring nodes. Corruption in IMS headers also happened on the CNI ring due to faulty ring hardware when message bytes were added or deleted. If a header byte was deleted or another byte was added to the header, the byte ordering necessary for correct header interpretation was destroyed and the CNI ring operation was adversely affected. The invalid header messages caused messages to circulate on the CNI ring.

1.03 In order to ensure the validity of the IMS headers as they travel around the ring, this feature causes IMS software to place an error control code, an 8-bit checksum, in the IMS header. The value of the error control code depends on the exact contents of the header. The CNI ring interface checks the error control code for its correctness and, if it is a good message, it allows the message to be propagated. Not all message headers are validated. Validating headers of all messages would have

required an increase in the number of header bytes. Thus, this feature validates hardware control messages only.

Software Characteristics

1.04 The following software characteristics apply to this feature:

- The IRN2B is a modified IRN2 board which supports the SRI2 chip.
- The SRI2 is an SRI chip, version 2, that includes logic to validate headers and remove circulating messages.
- The software does the following:
  - — Detects any message that fails a 3-bit check code, either being written by or passing by IRN2 on the CNI ring.
  - — Detects any broadcast or take message that fails an 8-bit checksum, either being written or passing by the IRN2 on the CNI ring.
  - — Performs a hardware command-message write check on all messages written to the CNI ring.
  - — Performs a virtual source address check.
  - — Performs a virtual command message destination address check on non-broadcast hardware command messages. Since the *4ESS*™ switch does not have IRN2 based Ring Peripheral Controller Numbers (RPCNs), this feature **does not** detect any hardware command message that has passed a monitor IRN2 Ring Peripheral Controller (RPC) more than once.
- The Interprocess Message Switch (IMS) header has not been expanded beyond its previous size.
- The IMS ring access routines are responsible for ensuring that all message header check fields are properly loaded before the messages are sent out to the ring. No application software changes have been required to ensure that this is done properly. Messages leaving the 3B Processor for the CNI ring will have their check fields filled in by an RPCN.
- The invalid headers detected by the header validation checks are logged.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management

5.01 The Common Network Interface Organization is responsible for supporting the Integrated Ring Node Version 2 Board (IRN2B) hardware, software, CNI ring software resident in the 3B Processor, and tools developed and delivered for the *4ESS* switch in the field.

6. Maintenance/Troubleshooting

Validating Header of Hardware Control Messages

6.01 A list of items related to validating the header of hardware control messages is as follows:

- The Interprocess Message Switch (IMS) header contains an error control code to detect corruption of the first control byte. The SRI2 is an SRI chip, version 2, (modified SRI) that includes logic to validate headers. This chip checks this error code and removes the message if the header is found corrupted. The header is validated at all Integrated Ring Node Version 2 Board (IRN2B) nodes that have not been taken out of service and reset on the CNI ring.
- All general broadcast and take message headers are validated.
- This feature restricts all message source and hardware control message destination addresses to a physical address. Virtual source addresses and virtual hardware control destination addresses are not allowed. These types of addresses are not used currently and future use is not anticipated. This restriction stops the messages that are not allowed and that have corrupted headers from propagating further and, as a result, improves the error coverage.
- In order to make certain that any mutilated message that looks like a hardware control message does not get written on the CNI ring, the IMS uses a permission latch. If the latch is not set, SRI2 does not allow any hardware control message to be written on the CNI ring.

Audits and Diagnostics

6.02 Audit, diagnostic, and firmware information for this feature are as follows:

- Routine audits to verify the proper functioning of the feature are provided.
- Phase 10 diagnostics test the new hardware functions.
- All pumped diagnostic code that places messages on the ring has been modified to ensure that hardware control, broadcast, and take message check fields are properly formatted.
- Small Scale Integration (SSI) or Integrated Ring Node (IRN) boot firmware changes are not required for this feature.

Applications Impact

6.03 The impact of this feature on applications is as follows:

- Applications are not required to make any changes in code, and total system down time should improve.
- This feature involves changes to the header format of hardware control messages and the destination address field of general broadcast and take messages for the check field. Applications cannot use these fields.
- Additions to message formatting software have resulted in a small expansion of memory usage by IMS in all existing node types.

Interprocess Message Switch (IMS) Impact

A. Hardware Considerations

6.04 Additional logic has been added to the CNI ring interface circuit for header validation. Since all ring interface logic is contained in a Single Ring Interface (SRI) VLSI device, a modification was required. The IMS hardware design was implemented as follows:

- Designed and manufactured SRI2 by making minor modifications to SRI
- Built a new IRN2 board, identified as IRN2B, which houses SRI2. This feature did not require any design changes in the IRN2 board.

B. Software Considerations

6.05 The IMS software areas affected are as follows:

- Message formatting for all node types
- 3B Processor ring Error Analysis and Recovery (EAR)
- RPC Monitor Mode Administration for 3B Processor
- 3B Processor Message Switch
- Phase 10 Diagnostics.

Assignment Requirements

6.06 For the header validation, an IRN2B is required at a minimum of one node.

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS*™ switches to be running the 4E23 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.

Feature Hardware/Software Upgrade Summary

7.03 This feature depends on the availability of the hardware and software functional availability of the original Integrated Ring Node Version 2 Board (IRN2).

7.04 The IRN2B and SRI2 have been designed so that header validation is an option. This allows the IRN2B to be used in a system that does not have software support for header validation. If the software is later upgraded to include this support, the option can then be turned on for these error detection capabilities.

7.05 In order to upgrade a CNI ring to add header validation, a new software release must be installed. The starting point for this upgrade is assumed to be a CNI ring with any combination of old and new ring hardware, SSI nodes, IRN nodes, and IRN2 nodes, or IRN2B nodes.

7.06 In order to support this feature, the new software release updates IMS software in all nodes on the CNI ring to ensure that the headers of all messages placed on the ring are initialized properly to include error detection code.

7.07 For this feature, the IRN2B plugs into the existing IRN slot.

8. Input/Output Manual Pages

8.01 The **REPT:RING-TRST-ER** Output Message is affected by this feature and is included in the Input/Output Message Manual for this Release. This message reports error messages for the CNI ring and provides the nine different types (formats) of errors shown in Table 3-A. A minor alarm sounds with all forms of this message. A major alarm sounds for the WRITE FORMAT ERROR type. The Input/Output Message manual specifies the action to be taken for each of the error message formats.

Table 3-A. CNI Ring Error Messages

Message Format	Error Message Indication
1	Reports problems involving ring or ring node communications
2	Reports a problem when a node receives a message that is shorter than the length indicated in the message's header
3	Indicates that a threshold has been exceeded for threshold type errors
4	Indicates that ring communications have been disrupted and that no format 1 error messages that report ring communications disruption were received in the 3B20D/3B21D computer
5	Reports a node problem that is either internal (reporting node not given in report) or that is detected by another node
6	Indicates that the Node Audit has detected a loss of ring messages
7	Indicates that the Node Audit has detected an intermittent loss of ring messages
8	Indicates that a message has been removed from the ring due to a validation failure on the header portion of the message.
9	Prints if Format 8 error messages occur at a high rate where error message buffers in the 3B20/3B20D computer are exhausted.

Segmentation Directory—Phase 2 Feature (4880)

4

Contents **Page**

Contents **Page**

Segmentation Directory—Phase 2 Feature (4880)

4

1. Feature Description

1.01 Segmentation Directory (SD) Phase 2 provides the migration of ANI-based capabilities from the *4ESS*™ switch to the SD Complex. Phase 2 is being deployed during the 4E23 Generic, Release 1 through Release 4. This includes the migration of the customer directory function for the following:

- Supporting non-featured long distance calls (POTS) (Release 1)
- Software Defined Network (SDN) customers, from the *4ESS* switch Automatic Number Identification (ANI) Trigger Tables and Universal Global Title Translation (UGTT) (Release 2)
- Switched Digital Services (SDS), from UGTT and the migration of ANI-based Feature Indicators for Business Markets Division (BMD) customers for (Release 2):
  - — ANI *TrueVoice*® service individual Per Call Control (iPCC)
  - — ANI *TrueVoice* Customer Specific Routing Option
  - — 1+Directory Link (DL) Blocking
  - — Calling Party Pays Airtime (CPPA) Blocking
  - — *QuietHear*.
- Universal Subscriber Data Structure (USDS), from the *4ESS* switch ANI Trigger Tables (Release 3)

- The Positive Call Processing (PCP) family of features, by adding the support of PCP for Equal Access Cellular subscribers (Release 4).

1.02 These capabilities are being transitioned in the same fashion used for Business Long Distance Service Positive Call Processing (BLDS PCP) in SD Phase 1. An SD Transition Type is defined for each service, and the associated SD Transition Status is defaulted to Present Mode of Operation (PMO) in each *4ESS* switch. In the SD, the SD Transition Status associated with the Precedence Index for each ANI being transitioned is also being set to PMO. Each service is transitioned to SD Mode of Operation (SMO) on a switch-by-switch basis, by setting both the SD Transition Status in the switch and the SD Transition Status associated with that switch in all SDs to SMO at approximately the same time.

1.03 To enable these capabilities to be totally migrated from the *4ESS* switch, the processing for basic non-featured long distance service calls (POTS) is modified so that the *4ESS* switch awaits a response from the SD prior to processing the call. This eliminates the need to "dual provision" featured ANIs in the *4ESS* switch ANI Trigger Table and in the SD. The POTS SD Transition Type is defined and transitioned to SMO in the *4ESS* switch in the same fashion as the other SD Transition Types.

1.04 The *4ESS* switch supports new network management controls designed to protect the network by reducing the number of SDQuery messages generated by the *4ESS* switch under circumstances where the calls associated with these queries are unlikely to complete. A pre-SDQuery manual control reduces the number of SDQueries that the *4ESS* switch generates for dialed numbers that have been determined to be hard-to-reach or that have been specified by the network managers, manually identified and entered into each *4ESS* switch.

1.05 Capabilities supporting new methods of operation for Software Defined Data Network (SDDN)-700 Number Outdialing and for Switched Digital International Carrier Specific Routing (SDI-CSR) are supported in SD Phase 2 to remove the dependence of these capabilities on UGTT.

2. Call Flow

2.01 The following call flow is presented in four segments listed below:

- Access Call Flow covers the call flow from the point at which the call is received by the *4ESS* switch, until the SDQuery message is received by the SD.
- SD Initial Processing and Response Call Flow covers the call flow from the point at which the SDQuery message is received by the SD, until an SDResponse message is received by the *4ESS* switch.
- Service Processor (SP) Processing and Response Call Flow covers the call flow from the point at which the SPQuery message is received by the SP, until the SPResponse message is received by the *4ESS* switch.
- SP Response Message and Subsequent Processing covers the call flow from the point at which the SPResponse message is received by the *4ESS* switch, until the call is completed or final-handled.

Access Call Flow Segments

1. The originating *4ESS* switch receives one of the following:
    - An ISDN User Part (ISUP) Initial Address Message (IAM) from an interconnecting Signaling System Number 7 (SS7) network
    - An ISUP IAM from a Direct Connect ISUP Trunk Sub-group (TSG)
    - An ISUP IAM from an AT&T Operator Service Position System (OSPS) *5ESS*® switch
    - An ISUP IAM from an interconnecting SS7 network via an Alternate Signaling Transport Network - Network Interconnect (ASTN-NI) Gateway switch Interconnect.
    - A Consultative Committee International Telegraph and Telephone (CCITT) SS7 ISUP (INUP) IAM from an interconnecting foreign administration
    - A CCITT SS7 Telephony User Part (TUP) IAM from an interconnecting foreign connection
    - A CCITT6 IAM from an interconnecting foreign administration
    - An inband-signaled incoming international call from an interconnecting foreign administration
    - A Multi-Frequency (MF)— signaled call from an interconnecting Local Exchange Carrier (LEC)
    - A Q.931 SETUP message on an incoming ISDN TSG

- A Dual Tone Multi-Frequency/Dial Pulse (DTMF/DP) -signaled call on an incoming direct-connect TSG.

2. If the incoming call is not using domestic SS7 ISUP signaling, IAM intercept in the Direct Link Node (DLN) does not apply. *Proceed to Step 8*.
3. The DLN checks to see if the IAM should be intercepted and a query sent to the SD. If:
   - IAM intercept or SD querying is turned off in the originating *4ESS* switch, or
   - Intercept is disabled due to abnormal conditions, or
   - Pre-SDQuery Manual Controls are in place for the originating switch, the originating *4ESS* switch DLN does not examine the message content nor send an SDQuery message, but continues processing the call. The DLN forwards the IAM to the 1B processor and indicate to the 1B processor that the IAM was not intercepted. The switch may send an SDQuery message from the *4ESS* switch 1B processor. *Proceed to Step 8*.
4. The originating switch DLN examines the Network Identification (NID) field of the Originating Point Code (OPC) of the incoming IAM and the presence or absence, length, or content of several parameters of the incoming IAM to determine if it should intercept this particular IAM. If:
   - IAM intercept is turned off for the NID indicated in the OPC of the incoming IAM, or
   - The NID indicated in the OPC of the incoming IAM is that of the AT&T network, or
   - Both the Calling Party Number and Charge Number parameters are absent from the incoming IAM, or
   - The Called Party Number parameter of the incoming IAM contains a seven-digit NANP number, or
   - The Originating Line Information (OLI) parameter matches one of the values in a provisionable OLI Screening table.

   the originating *4ESS* switch DLN does not send an SDQuery message and continues processing the call. The DLN forwards the IAM to the 1B processor and indicate to the 1B processor that the IAM was not intercepted, and the switch may send an SDQuery message from the 1B processor. *Proceed to Step 8*.
5. The *4ESS* switch DLN generates a Transaction ID for this call.
6. The *4ESS* switch DLN generates a SDQuery (TCAP BEGIN) message.

7. The *4ESS* switch DLN generates an SD to which to route the SDQuery (TCAP BEGIN) message based on a round-robin routing scheme among the SDs deployed in the network, applying Directory Function Server (DFS) Application Overload controls if in place. The switch starts an SDQuery Timer, start an SDQuery Guard Timer (if turned on), and send the SDQuery message. Then the DLN delivers the IAM and other information to the *4ESS* switch 1B processor.
8. The *4ESS* switch marks the incoming trunk as "busy".
9. The *4ESS* switch performs all existing screening and digit analysis on the call up to, and including, searching the ANI Trigger Table.

   If any of the screening results in an indication to kill a call for a reason other than a Network Call Denial (NCD) indication, the *4ESS* switch final-handle the call. If an SDQuery message had been sent by IAM intercept, the *4ESS* switch also discards the Transaction ID.
10. The originating switch attempts to derive an "SD Transition Type". Examples of SD Transition Types include "BLDS_PCP", "SDN", "USDS", and "POTS". Each SD Transition Type has an SD Transition Status of either PMO (discard SDResponse message and proceed with existing call processing) or SMO (proceed based on contents of SDResponse message).

    If the call does not fit the conditions for any defined SD Transition Type and is not defined to always derive an SD Transition Status of SMO, the SD Transition Status of the call is PMO.
11. The *4ESS* switch proceeds according to the following rules:

    - If the call fits one of a set of call types (such as calls incoming from AT&T Trigger Platform (ATP) or network adjuncts), the *4ESS* switch handles the call per current procedures. It does not send an SDQuery message. If an SDQuery message was previously sent due to IAM intercept, it ignores any SDResponse message which may be received. **End of SD Call Flow**.
    - If the call is not one of the types referred to in the previous step, and:
      - — An SDQuery message was sent by IAM intercept, *proceed to Step 14*.
      - — An SDQuery message was not sent by IAM intercept and SD querying is turned off in the originating *4ESS* switch, the switch:
        1. If the SD Transition Status of the call is SMO, default-handle the call. *Proceed to the "Default Handling" section in the Call Flow*.
        2. If the SD Transition Status of the call is PMO, proceed with existing call processing. **End of SD Call Flow**.

— An SDQuery message was not sent by IAM intercept due to failure to route the SDQuery message, the switch :

1. If the SD Transition Status of the call is SMO, default-handle the call. *Proceed to the "Default Handling" section in the Call Flow*.
2. If the SD Transition Status of the call is PMO, proceed with existing call processing. **End of SD Call Flow**.

— An SDQuery message was not sent by IAM intercept for a reason other than failure to route the SDQuery message, and SD querying is turned on in the originating *4ESS* switch, the switch attempts to send an SDQuery message from the 1B processor. *Proceed with Step 12*.

12. Because no SD query was sent from the DLN, the *4ESS* switch 1B processor generates an SDQuery (TCAP BEGIN) message.
13. The *4ESS* switch applies any Pre-SDQuery manual controls which may be in place. If the controls result in the SDQuery being not sent, the switch:
    - If the SD Transition Status derived from the call is SMO, depending on the control type installed, either:
      — final-handle the call. **End of SD Call Flow**.
      — default-handle the call. *Proceed to the "Default Handling" section of the Call Flow*.
14. The *4ESS* switch selects an SD to which to route the SDQuery (TCAP BEGIN) message based on a round-robin routing scheme among the SDs deployed in the network (incorporating the SD Skip Control) applying DFS Application Overload controls if in place, start an SD Query Timer, start an SD Query Guard Timer (if turned on), and send the SDQuery message.
15. If the incoming call is cleared for any reason, the *4ESS* switch discards the Transaction ID associated with the call and SDQuery.
16. The originating *4ESS* switch only waits for the SDResponse message if the SD transition status derived for the call is SMO.
    - If the SD Transition Status derived for the call is PMO, the *4ESS* switch closes the SD transaction and proceed with existing call processing, ignoring any SDResponse message or SPResponse message. **End of SD Call Flow**.
    - If the SD Transition Status derived for the call is SMO, the *4ESS* switch waits for the SDResponse message and continue processing the call based on the SDResponse message content. *Proceed to the section "SD Initial Processing and Response Call Flow Segments" in the Call Flow*.

SD Initial Processing and Response Call Flow Segments

2.02 Upon receipt of a valid SDQuery message, the SD constructs an ANI key, DN key, Service Type key, and Carrier Selection key, and searches its database using these keys. Based on the information retrieved by the SD, one of the following six responses are sent to the *4ESS* switch:

- Proceed - Normal
- Proceed - Abnormal (with Reason Code)
- Revert to PMO
- Deny
- Wait for Instructions
- Query Service Processor.

A. Proceed - Normal

2.03 A Proceed - Normal instruction is used when no match is found in any of the SD directory tables indicating an SPQuery is required, and the *4ESS* switch routes and records the call with no abnormal condition processing (such as incrementing measurements or generating a call irregularity report).

1. If no matches are found in the SD, or an ANI match is found which includes a Service Processor Index which indicates "No Service Processor Required", the SD sends an SDResponse message with a Provide Instructions - Proceed operation to the switch, where the Proceed operation does not include a reason code parameter.
2. The *4ESS* switch receives the SDResponse message and stops the SD Query Timer and SD Query Guard Timer, if running.
3. Based on the presence of a Provide Instructions - Proceed operation which does not include a reason code parameter, the *4ESS* switch :
    - Determine whether a Network Access Interrupt (NAI) query is appropriate for the call per existing NAI procedures
    - Generate and send an NAI query, if an NAI query is determined to be required, and
    - Default-handle the call, using ANI Feature Indicators to influence call handling as if they had been found associated with the calling party's ANI in the switch ANI Trigger Table. *Proceed to the "Default Handling" section in the Call Flow.*

B. Proceed - Abnormal

2.04 A Proceed - Abnormal instruction is used when an SP should be queried to process the call, but the SD is unable to do so due to an abnormal condition. The *4ESS* switch attempts to route and record the call if possible, and to take appropriate action to flag the abnormal operation (such as incrementing a measurement and generating a call irregularity report).

1. If more than one match is found, the SD searches the SP Precedence Table to determine the highest precedence match. If only one match is found, that is considered the highest precedence match. If the ASTN indicator was received in the SDQuery message indicating that ASTN is active, the SD assumes a value of SMO for the Transition Indicator for this call per existing SD Complex requirements; otherwise, the SD searches the Transition Table using the Precedence Index from the highest precedence match and the point code of the querying *4ESS* switch, and derives an SD Transition Status of SMO.
2. The SD searches the SP Table using the SP Index from the highest precedence match and determines the point code to which the SPQuery message should be sent.
3. The SD determines that it is unable to send an SPQuery message due to one of the following abnormal conditions:
   - The SP is under a Network Management Application Overload Control
   - The SP is under a Network Management Manual Control
   - The SP is in a Subsystem Prohibited condition
   - Certain SD application processing problems.
4. The SD sends an SDResponse message with a Provide Instructions - Proceed operation to the switch, where the Proceed operation includes a reason code parameter indicating the abnormal condition identified by the SD (in Step 3).
5. The *4ESS* switch receives the SDResponse message and stops the SD Query Timer and SD Query Guard Timer, if running.
6. Based on the presence of a Provide Instructions - Proceed operation including a reason code parameter, the *4ESS* switch generates a call irregularity report, increment appropriate counters, and default- handle the call. Because the Proceed message includes a reason code parameter indicating that the Proceed was sent due to abnormal conditions, the switch does not perform its NAI processing to determine if an NAI query need be sent. *Proceed to the "Default Handling" section in the Call Flow.*

C. Revert to PMO

2.05 A Revert to PMO instruction is used when the SD determines that the highest-precedence match has an SD Transition Status of PMO, or has an SP Index which indicates that the service has not yet migrated to SD and must therefore be forced

to PMO. The *4ESS* switch is explicitly instructed to continue with PMO processing, even though the *4ESS* switch may have derived an SD Transition Status of SMO. The instruction is needed to support interactions between services which have not yet migrated to the SD architecture and those which have migrated.

1. If more than one match is found, the SD searches the SP Precedence Table to determine the highest precedence match. If only one match is found, that is considered the highest precedence match. If the SP Index associated with the highest precedence match has a value which indicates "Force to PMO", the SD assumes a value of PMO for the call; otherwise, the SD searches the Transition Table using the Precedence Index from the highest precedence match and the point code of the querying *4ESS* switch, and derives an SD Transition Status of (in this case) PMO.
2. The SD sends an SDResponse message with a Revert to PMO instruction to the switch. The SD also includes in the Revert to PMO operation any ANI feature Indicators found associated with the ANI match, if present.
3. The *4ESS* switch receives the SDResponse message and stops the SD Query Timer and SD Query Guard Timer, if running.
4. The *4ESS* switch processes the call based on the presence of a Revert to PMO instruction:
   - If the call is defined to always derive an SD Transition Status of SMO, the *4ESS* switch default-handles the call, using ANI Feature Indicators to influence call handling as if they had been found associated with the calling party's ANI in the switch ANI Trigger Table. *Proceed to the "Default Handling" section in the Call Flow.*
   - Otherwise, the *4ESS* switch continues with existing call processing as if it had derived an SD Transaction Status of PMO for the call, with the exception that it applies the ANI Feature Indicators received as if they had been found associated with the calling party's ANI in the switch ANI Trigger Table. **End of SD Call Flow**.

D. Deny

NOTE:
No records are expected to be provisioned with an ANI Handling Indicator of "Deny" in the SD Phase 2 timeframe; however, as the capability is supported in both the SD and the *4ESS* switch, the call flow is included for completeness.

1. If more than one match is found, the SD searches the SP Precedence Table to determine the highest precedence match. If only one match is found, that is considered the highest precedence match. If the ASTN indicator was received in the SDQuery message indicating that ASTN is active, the SD assumes a value of SMO for the Transition Indicator, for this call per existing SD Complex requirements. Otherwise, the SD searches the Transition Table using the

Precedence Index from the highest precedence match and the point code of the querying *4ESS* switch, and derives an SD Transition Status of (in this case) SMO. If the highest precedence match is an ANI match for which the ANI Handling indicator is set to "Deny", the SD sends an SDResponse message with a Connection Control - Disconnect operation to the *4ESS* switch.

2. The *4ESS* switch receives the SDResponse message and stops the SD Query Timer and SD Query Guard Timer, if running.
3. Based on the presence of a Connection Control - Disconnect operation, the *4ESS* switch final-handles the call using the existing NCD treatment. **End of SD Call Flow**.

E. Wait for Instructions

2.06 A Wait for Instructions response is used when the SD determines that an SP is queried to process the call. The SD sends the Wait for Instructions response to the *4ESS* switch after successfully routing the SPQuery message over the outgoing signaling link towards the SP. The *4ESS* switch retains information contained in the SDResponse message and waits for an SPResponse message.

1. If more than one match is found, the SD searches the SP Precedence Table to determine the highest precedence match. If only one match is found, that is considered the highest precedence match. The SD searches the Transition Table using the Precedence Index from the highest precedence match and the point code of the querying *4ESS* switch, and derives an SD Transition Status of (in this case) SMO.
2. The SD searches the SP Table using the SP Index from the highest precedence match and determines the SP Query Type and SP address.
3. The SD constructs and sends the SPQuery message to the identified SP.
4. The *4ESS* switch stops the timers when it receives the message from the SD.
5. Based on the presence of a Wait for Instructions operation, the *4ESS* switch :
    - Retains a Correlation ID with the same value as the Destination Transaction ID of the SDResponse message to associate with a Correlation ID in an SPResponse message
    - Retains the SP Point Code/Subsystem Number (PC/SSN) received in the SDResponse message
    - Retains the Service Indicator received in the SDResponse message
    - Increments the Service Indicator measurement associated with the received Service Indicator, and
    - Starts the SP Response Timer, and starts the SP Response Guard Timer, if appropriate.

6. The SP receives the SPQuery message from the SD. *Proceed to the "SP Processing and Response Call Flow Segments" section in the Call Flow*.

F. Query Service Processor

2.07 A Query Service Processor instruction is used when the SD determines that an SP should be queried to process the call, but is unable to do so due to a specific abnormal condition in the signaling network. The SD includes the necessary parameters of the SPQuery message, and the destination address of the SPQuery message, in the Query Service Processor instruction sent to the *4ESS* switch. The *4ESS* switch builds the SPQuery message using the parameters of the Query Service Processor instruction and attempts to send the query to the indicated SP destination address.

1. If more than one match is found, the SD searches the SP Precedence Table to determine the highest precedence match. If only one match is found, that is considered the highest precedence match. If the ASTN indicator was received in the SDQuery message indicating that ASTN is active, the SD assumes a value of SMO for the Transition Indicator for this call; otherwise, the SD searches the Transition Table using the Precedence Index from the highest precedence match and the point code of the querying *4ESS* switch, and derives an SD Transition Status of (in this case) SMO.
2. The SD searches the SP Table using the SP Index from the highest precedence match and determines the SPQuery Type and SP address.
3. The SD determines that the SPQuery cannot be sent from the SD, due to an ASTN condition at the originating switch or due to Message Transfer Part (MTP) route unavailability or congestion to the identified SP.
4. The SD sends an SDResponse message with a Query Service Processor operation to the *4ESS* switch. The parameters included in the Query Service Processor operation are those that the SD determines are required for the type of SP Query to be sent, based on the SP Index retrieved. The Query Service Processor instruction is used to instruct the switch to query either a No. 2 Customer Call Processing/No. 2 Network Control Point (2CCP/2NCP) or No. 2 Direct Services for ANIs (2DSA)/2NCP; no explicit indication of the type of Service Processor being queried is sent to the *4ESS* switch, and no difference in procedures is specified in the *4ESS* switch. The SD includes either one or two SCCP Calling Party Address parameters, depending on the condition causing the SD to send the Query Service Processor operation.
5. The *4ESS* switch receives the SDResponse message and stops the SD Query Timer and SD Query Guard Timer, if running.
6. Based on the presence of a Query Service Processor operation, the *4ESS* switch constructs an SPQuery message. With the exception of the SCCP Calling Party Address (2NCP PC/SSN) parameter (s), which are used to route the SPQuery message from the *4ESS* switch, and the Service Indicator parameter, which is used to increment service-specific measurements, the switch directly copies all

parameters from the Provide Instructions - Query Service Processor operation in the SDResponse message to the Provide Instructions - Start operation in the SPQuery message.

7. The *4ESS* switch routes the SPQuery message, using either the single SP PC/SSN received or using primary/secondary PC/SSN routing, and starts an SP Query Timer.
8. The SP receives the SPQuery message from the *4ESS* switch. *Proceed to the "SP Processing and Response Call Flow Segments" section in the Call Flow*.

SP Processing and Response Call Flow Segments

2.08 Processing performed by the SP depends on the SP to which the query was sent. Processing performed by the 2DSA/2NCP is discussed in the "2DSA/2NCP Processing and Response" section in the Call Flow.

A. 2DSA/2NCP Processing and Response

2.09 The 2DSA/2NCP receives the SPQuery message from the SD or the *4ESS* switch. Based on the Customer ID, the 2DSA/2NCP retrieves the customer record.

If the Customer ID points to	Proceed to:
an SDN customer record	the "SDN" section in the Call Flow.
the SDS Master Record	the "SDS" section in the Call Flow.
a PCP record	the "PCP and PCP Cellular" section in the Call Flow.

SDN

2.10 The 2DSA/2NCP performs the call processing specified in the SDN customer record:

- If interaction with the caller is required to play an announcement and collect digits, the 2DSA/2NCP sends an SPResponse message containing a Miscellaneous - SD Correlate operation and a Caller Interaction - Play Announcement and Collect Digits operation to the switch. An SP Service Identification of SDN is included in the SD Correlate operation. This indicates to the *4ESS* switch that further processing should be per existing procedures for the SDN service. The SPResponse message is a TCAP BEGIN (SPQuery received from SD) or TCAP CONTINUE (SPQuery received from *4ESS* switch). *Proceed to the "SPResponse Message and Subsequent Processing" section*.
- If interaction with the caller is required to play an announcement and terminate the call, the 2DSA/2NCP sends an SPResponse message containing a Miscellaneous - SD Correlate operation, a Caller Interaction - Play Announcement operation, and a Send Notification - Announcement Played

operation to the switch. An SP Service Identification of SDN is included in the SD Correlate operation. This indicates to the *4ESS* switch that further processing should be per existing procedures for the SDN service. The SPResponse message is a TCAP BEGIN (SPQuery received from SD) or TCAP CONTINUE (SPQuery received from the *4ESS* switch). *Proceed to the "SPResponse Message and Subsequent Processing" section in the Call Flow.*

- If a Service Assist is required, the 2DSA/2NCP sends a SPResponse message containing a Miscellaneous - SD Correlate operation and a Connection Control - Temporary Connect operation to the switch. The 2DSA/2NCP may also include a Provide Instruction - Invoke Switch Capabilities operation in the SPResponse message. An SP Service Identification of SND is included in the SD Correlate operation. This indicates to the *4ESS* switch that further processing should be per existing procedures for the SDN service. The SPResponse message is a TCAP BEGIN (SPQuery received from SD) or TCAP CONTINUE (SPQuery received from *4ESS* switch). *Proceed to "SPResponse Message and Subsequent Processing" section in the Call Flow.*

- If a handoff is required, the 2DSA/2NCP sends an SPResponse message containing a Miscellaneous - SD Correlate operation and a Connection Control - Connect operation to the switch. The 2DSA/2NCP may also include a Provide Instruction - Invoke Switch Capabilities operation in the SPResponse message. An SP Service Identification of SDN is included in the SD Correlate operation. This indicates to the *4ESS* switch that further processing should be per existing procedures for the SDN service. The SPResponse message is a TCAP BEGIN (SPQuery received form SD) or TCAP CONTINUE (SPQuery received from *4ESS* switch). *Proceed to the "SPResponse Message and Subsequent Processing" section in the Call Flow.*

- If no interaction is required to route and record the call, the 2DSA/2NCP sends an SPResponse message containing a Miscellaneous - SD Correlate operation, a Charging - Bill Call operation, and a Connection Control - Connect operation to the switch. The 2DSA/2NCP may also include a Private Instructions - Invoke Switch Capabilities operation in the SPResponse message. An SP Service Identification of SDN is included in the SD Correlate operation. This indicates to the *4ESS* that further processing should be per existing procedures for the SDN service. The SPResponse message is a TCAP BEGIN with Prearranged END (SPQuery received from SD) or TCAP END (SPQuery received from *4ESS* switch). *Proceed to the "SPResponse Message and Subsequent Processing" section in the Call Flow.*

- If additional time is required by the 2DSA/2NCP (for example, to query a remote database for Global SDN features or to query an SDS 2DSA/2NCP for SDDN 700 Outdating), the 2DSA/2NCP sends an SPResponse message containing a Miscellaneous - SD Correlate operation and a Procedural - Refresh operation to the switch. For SDDN 700 Outdialing, a SP Service Identification of SDN is included in the SD Correlate operation; otherwise, a SP Service Identification of SDN is included in the SD Correlate operation. This indicates to the *4ESS* switch that further processing should be per existing procedures for the SDS or SDN

service, respectively. The SPResponse message is a TCAP BEGIN (SPQuery received from SD) or TCAP CONTINUE (SPQuery received from *4ESS* switch). *Proceed to the "SPResponse Message and Subsequent Processing" section in the Call Flow*.

SDS

2.11 The NCP performs the call processing specified in the SDS Master Record:

- If the call is routed and recorded, the 2DSA/2NCP sends an SPResponse message containing a Miscellaneous - SD Correlate operation, a Charging - Bill Call operation, and a Connection Control - Connect operation to the switch. No ANI Feature Indicators are provisioned for SDS customer ANIs; therefore, the SPResponse message does not include a Provide Instructions - Invoke Switch Capabilities operation. An SP Service Identification of SDS is included in the SD Correlate operation. This indicates to the *4ESS* switch that further processing should be per procedures for the SDS service. The SPResponse message is a TCAP BEGIN with Prearranged END (SPQuery received from SD) or TCAP END (SPQuery received from *4ESS* switch).

  NOTE:
  The Charging - Bill Call operation and Connection Control - Connect operation includes appropriate information for SDI-CSR, if applicable.

- *Proceed to the "SPResponse Message and Subsequent Processing" section in the Call Flow*.
- If the call is terminated (for example, due to no customer ANI found in the SDS NCP), the 2DSA/2NCP sends an SPResponse message containing a Miscellaneous - SD Correlate operation, a Charging - Bill Call operation, and a Connection Control - Disconnect operation to the switch. An SP Service Identification of SDS is included in the SD Correlate operation. This indicates to the *4ESS* switch that further processing should be per existing procedures for the SDS service. The SPResponse message is a TCAP BEGIN with Prearranged END (SPQuery received from SD) or TCAP END (SPQuery received from *4ESS* switch). *Proceed to the "SPResponse Message and Subsequent Processing" section in the Call Flow*.

PCP and PCP Cellular

2.12 The 2DSA/2NCP provides the same features for PCP and for PCP for Equal Access Cellular customers. The NCP performs the call processing specified in the PCP customer record:

- If interaction with the caller is required to play an announcement and collect digits, the 2DSA/2NCP sends an SPResponse message containing a Miscellaneous - SD Correlate operation and a Caller Interaction - Play Announcement and Collect Digits operation to the switch. An SP Service Identification of PCP is included in the SD Correlate operation. This indicates to the *4ESS* switch that further processing should be per existing procedures for the PCP service. The SPResponse message is a TCAP BEGIN (SPQuery received from SD) or TCAP CONTINUE (SPQuery received from *4ESS* switch). *Proceed to the "SPResponse Message and Subsequent Processing" section in the Call Flow*.
- If interaction with the caller is required to play an announcement and terminate the call, the 2DSA/2NCP sends an SPResponse message containing a Miscellaneous - SD Correlate operation, a Charging - Bill Call operation, a Caller Interaction - Play Announcement operation, and a Connection Control - Disconnect operation to the switch. An SP Service Identification of PCP is included in the SD Correlate operation. This indicates to the *4ESS* switch that further processing should be per existing procedures for the PCP service. The SPResponse message is a TCAP BEGIN with Prearranged END (SPQuery received from SD) or TCAP END (SPQuery received from the *4ESS* switch). *Proceed to the "SPResponse Message and Subsequent Processing" section in the Call Flow*.
- If a Service Assist is required, the 2DSA/2NCP sends an SPResponse message containing a Miscellaneous - SD Correlate operation and a Connection Control - Temporary Connect operation to the switch. The 2DSA/2NCP may also include a Provide Instructions - Invoke Switch Capabilities operation in the SPResponse message. An SP Service Identification of PCP is included in the SD Correlate operation. This indicates to the *4ESS* switch that further processing should be per existing procedures for the PCP service. The SPResponse message is a TCAP BEGIN (SPQuery received from SD) or TCAP CONTINUE (SPQuery received from *4ESS* switch). *Proceed to "SPResponse Message and Subsequent Processing" section in the Call Flow*.
- If a handoff is required, the 2DSA/2NCP sends an SPResponse message containing a Miscellaneous - SD Correlate operation and a Connection Control - Connect operation to the switch. The 2DSA/2NCP may also include a Provide Instructions - Invoke Switch Capabilities operation in the SPResponse message. An SP Service Identification of PCP is included in the SD Correlate operation. This indicates to the *4ESS* switch that further processing should be per existing procedures for the PCP service. The SPResponse message is a TCAP BEGIN (SPQuery received form SD) or TCAP CONTINUE (SPQuery received from *4ESS* switch). *Proceed to the "SPResponse Message and Subsequent Processing"*.

- If no interaction is required to route and record the call, the 2DSA/2NCP sends an SPResponse message containing a Miscellaneous - SD Correlate operation, a Charging - Bill Call operation, and a Connection Control - Connect operation to the switch. The 2DSA/2NCP may also include a Private Instructions - Invoke Switch Capabilities operation in the SPResponse message. An SP Service Identification of PCP is included in the SD Correlate operation. This indicates to the *4ESS* switch that further processing should be per existing procedures for the PCP service. The SPResponse message is a TCAP BEGIN with Prearranged END (SPQuery received from SD) or TCAP END (SPQuery received from *4ESS* switch). *Proceed to the "SPResponse Message and Subsequent Processing" section in the Call Flow*.

B. 2CCP/2NCP Processing and Response

2.13 The 2CCP/2NCP receives the SPQuery message from the SD or the *4ESS* switch. Based on the ANI, Destination Number, and Service Type, the 2CCP/2NCP retrieves customer data, customer profiles and associated data, and determines the appropriate processing to be applied to the call:

- If the processing to be applied is for USDS-supported customer features, such as Consumer Long Distance (CLD) Custom Services and Leave-A-Message, proceed to the "USDS" section in the Call Flow.
- If the processing to be applied is for control of *QuietHear*, *proceed to the "QuietHear" section of the Call Flow*.

USDS

2.14 The 2CCP/2NCP responds to the switch with a request either to invoke customer features, to complete the call without features, or to final- handle the call:

- For all USDS-supported customer features, the 2CCP/2NCP sends the switch an SPResponse message containing a Miscellaneous - SD Correlate operation and a Provide Instructions - Invoke Switch Capabilities operation. An SP Service Identification of USDS is included in the SD Correlate operation. This indicates to the *4ESS* switch that further processing should be per existing procedures for USDS. The SPResponse message is a TCAP BEGIN with Prearranged END (SPQuery received from SD) or TCAP END (SPQuery received from *4ESS* switch). The capabilities to be invoked are indicated by the Switch Capability parameter of the Invoke Switch Capabilities operation.
  - — If the call is routed to an adjunct, the 2CCP/2NCP indicates "Route to ALA" in the Switch Capability parameter and include an Adjunct Logical Address (ALA) parameter in the Invoke Switch Capabilities operation.
  - — If the switch queries NAI for the call, the 2CCP/2NCP indicates "Query NAI" in the Switch Capability parameter of the Invoke Switch Capabilities operation.

— If the switch applies *TrueVoice* ANI per-call control, the 2CCP/2NCP indicates "Apply *TrueVoice* Per Call Control (ANI)" in the Switch Capability parameter of the Invoke Switch Capabilities operation.

— If the switch is not to apply 1+DL on the call, the 2CCP/2NCP indicates "Apply 1+DL Blocking" in the Switch Capability parameter of the Invoke Switch Capabilities operation.

— If the switch applies Transmitted Noise Reduction, the 2CCP/2NCP indicates "Apply TNR" in the Switch Capability parameter of the Invoke Switch Capabilities operation.

— If the switch hairpins the call through an ATP Service Circuit Unit to apply Leave-A-Message service, the 2CCP/2NCP indicates "Invoke ATP" in the Switch Capability parameter and include other parameters specified for the "Leave-A-Message" in the Invoke Switch Capabilities operation.

— If *QuietHear* is turned off based on ANI, the Invoke Switch Capabilities operation indicates "*QuietHear* Blocking - Apply" in the Switch Capability parameter of the Invoke Switch Capabilities operation.

- If the switch completes the call without features, the 2CCP/2NCP sends the switch an SPResponse message containing a Miscellaneous - SD Correlate operation and a Provide Instructions - Proceed operation. A SP Service Identification of USDS is included in the SD Correlate operation. This indicates to the *4ESS* switch that further processing should be per existing procedures for USDS. The SPResponse message is a TCAP BEGIN with Prearranged END (SPQuery received from SD) or TCAP END (SPQuery received from 4ESS switch).
- If the switch final-handles the call, the 2CCP/2NCP sends the switch an SPResponse message containing a Miscellaneous - SD Correlate operation and a Connection Control - Disconnect operation. A SP Service Identification of USDS is included in the SD Correlate operation. This indicates to the *4ESS* switch that further message is a TCAP BEGIN with Prearranged END (SPQuery received from SD) or TCAP END (SPQuery received from 4ESS switch).
- *Proceed to the "SPResponse Message and Subsequent Processing" section in the Call Flow.*

SPResponse Message and Subsequent Processing

2.15 The switch identifies the call associated with the incoming SPResponse message based on the Correlation ID (if a TCAP BEGIN or BEGIN with Prearranged END message) or the Transaction ID (if a TCAP CONTINUE or END message), stops the SP Response Timer or SP Query Timer, as appropriate, and acts on the instructions received from the SP. Further call processing depends on the SP Service Identification in the SD Correlate operation:

If the SP Service Identification is	Proceed to the Call Flow section:
SDN	SP Service Identification = SDN.
SDS	SP Service Identification = SDS.
PCP	SP Service Identification = PCP.
USDS	SP Service Identification = USDS.
not present	SP Service Identification Not Present.

A. SP Service Identification = SDN

1. The *4ESS* switch takes actions based on the operations in the SPResponse message:

   - If the SPResponse message includes a Caller Interaction - Play Announcement and Collect Digits operation, the *4ESS* switch sends an early ACM once continuity is established, connect the call to the announcement indicated by the parameters of the Play Announcement and Collect Digits operation, collect the requested digits, and return the digits to the 2DSA/2NCP in a TCAP CONTINUE message.
   - If the SPResponse message indicates a Caller Interaction - Play Announcement operation, the *4ESS* switch sends an early ACM once continuity is established and connect the call to the announcement indicated by the parameters of the Play Announcement operation.
   - If the SPResponse message includes a Send Notification - Announcement Played operation, the *4ESS* switch notifies the 2DSA/2NCP upon the completion of an announcement played.
   - If the SPResponse message includes a Connection Control - Temporary Connect operation, the *4ESS* switch initiates a Service Assist to the indicated switch.
   - If the SPResponse message includes a Charging Bill Call operation, the *4ESS* switch creates an Automatic Message Accounting (AMA) record for the call including the appropriate information from the Bill Call operation, using SP Service Identification of "SDN" from the Miscellaneous - SD Correlate operation if necessary.
   - If the SPResponse message includes a Connection Control - Connect operation, the *4ESS* switch connects the call using the routing information in the parameters of the Connect operation, using SP Service Identification of "SDN" from the Miscellaneous - SD Correlate operation if necessary.
   - If the SPResponse message includes a Connection Control - Disconnect operation, the *4ESS* switch final-handles the call using the information in the parameters of the Disconnect operation.

- If the SPResponse message includes a Procedural - Refresh operation, the *4ESS* switch clears and restarts the SP Response Timer or SP Query Timer, as appropriate, with the timeout value as indicated by the parameter of the Refresh operation.
- If the SPResponse message or any subsequent TCAP message on the same transaction includes a Provide Instruction - Invoke Switch Capabilities operation, the *4ESS* switch takes action based on the content of the Switch Capability parameter:

If the Switch Capability value specifies	**the switch does not apply:**
Apply *TrueVoice* ANI iPCC	*TrueVoice* to the call, using iPCC.
Apply *TrueVoice* ANI CSRO	*TrueVoice* to the call, using the CSRO option.
Apply 1+DL Blocking	Directory Link to the call.
Apply *QuietHear* Blocking	*QuietHear* to the call. (Note that this is an unexpected response for 2DSA/2NCP).

- Further processing is dependent on the call processing logic in the 2DSA/2NCP, and is handled per existing requirements.

NOTE:
If an SPResponse message including a Connect operation contains the Government Emergency Telecommunications Service (GETS) destination number, the *4ESS* switch launchs a PMO GETS NCP query to obtain the routing number per existing requirements. Note also that SMO calls to the GETS destination number for which default- handling occurs still queries the GETS NCP per existing requirements.

B. SP Service Identification = SDS

1. The *4ESS* switch takes actions based on the operations in the SPResponse message:
   - If the SPResponse message includes a Charging - Bill Call operation, the *4ESS* switch creates an AMA record for the call including the appropriate information from the Bill Call operation, using the SP Service Identification of "SDS" from the Miscellaneous - SD Correlate operation if necessary.
   - If the SPResponse message includes a Connection Control - Connect operation, the *4ESS* switch connects the call using the routing information in the parameters of the Connect operation, using the SP Service Identification of "SDS" from the Miscellaneous - SD Correlate operation if necessary.

- If the SPResponse message includes a Connection Control - Disconnect operation, the *4ESS* switch final-handles the call using the information in the parameters of the Disconnect operation.

2. Further processing is handled per existing requirements (except for SDDN 700 Outdialing). Note that the parameters of the Connect and Bill Call operations may include information currently received from the 2DSA/2NCP supporting Carrier Specific Routing.

C. SP Service Identification = PCP

1. The *4ESS* switch takes action based on the operations in the SPResponse message:

   - If the SPResponse message includes a Caller Interaction - Play Announcement and Collect Digits operation, the *4ESS* switch sends an early ACM once continuity is established, connect the call to the announcement indicated by the parameters of the Play Announcement and Collect Digits operation, collect the requested digits, and return the digits to the 2DSA/2NCP in a TCAP CONTINUE message.
   - If the SPResponse message includes a Caller Interaction - Play Announcement operation, the *4ESS* switch sends an early ACM once continuity is established and connect the call to the announcement indicated to the parameters of the Play Announcement operation.
   - If the SPResponse message includes a Connection Control - Temporary Connect operation, the *4ESS* switch initiates a Service Assist to the indicated switch.
   - If the SPResponse message includes a Charging - Bill Call operation, the *4ESS* switch creates an AMA record for the call including the appropriate information from the Bill Call operation, using the SP Service Identification of PCP from the Miscellaneous - SD Correlate operation if necessary.
   - If the SPResponse message includes a Connection Control - Connect operation, the *4ESS* switch connects the call using the routing information in the parameters of the Connect operation, using the SP Service Identification of PCP from the Miscellaneous - SD Correlate operation if necessary.
   - If the SPResponse message includes a Connection Control - Disconnect operation, the *4ESS* switch final-handles the call using the information in the parameters of the Disconnect operation.

- If the SPResponse message or any subsequent TCAP message on the same transaction includes a Provide Instructions - Invoke Switch Capabilities operation, the *4ESS* switch takes action based on the content of the Switch Capability parameter:

If the Switch Capability value specifies	**the switch does not apply:**
Apply *TrueVoice* ANI iPCC	*TrueVoice* to the call, using iPCC.
Apply *TrueVoice* ANI CSRO	*TrueVoice* to the call, using the CSRO option.
Apply 1+DL Blocking	Directory Link to the call.
Apply *QuietHear* Blocking	*QuietHear* to the call. (Note that this is an unexpected response for 2DSA/2NCP).

- Further processing is dependent on the call processing logic in the 2DSA/2NCP, and is handled per existing requirements.

D. SP Service Identification = USDS

1. The SPResponse message received from USDS includes either a Provide Instructions - Invoke Switch Capabilities operation, with one or more parameters, a Provide Instructions - Proceed operation, or a Connection Control - Disconnect operation.

   - If the SPResponse message includes a Provide Instructions - Invoke Switch Capabilities operation, the *4ESS* switch takes actions based on the parameters of the Invoke Switch Capabilities operation in the SPResponse message:

If the Switch Capability value specifies	**the *4ESS* switch:**
Route to ALA	uses the value in the ALA parameter to identify the address and routing scheme to reach the adjunct.
Query to ALA	launches the query and continues to establish the call.
Apply *TrueVoice* ANI iPCC	does not apply *TrueVoice* to the call.
Apply 1+DL Blocking	does not apply DL to the call.
Apply TNR	applies TNR as per existing requirements.
Invoke ATP	invokes the ATP node and hairpins the call through an ATP SCU to offer the customer the Leave-A-Message service.
Apply *QuietHear* Blocking	does not apply *QuietHear* to the call.

     Continue with Step 2.

   - If the SPResponse message contains a Provide Instructions - Proceed operation, the *4ESS* switch routes and records the call per existing USDS requirements. **End of SD Call Flow**.

   - If the SPResponse message contains a Connection Control - Disconnect operation, the *4ESS* switch final-handles the call per existing USDS requirements. **End of SD Call Flow**.

2. Processing after applying the capabilities specified in the SPResponse message depends on the dialed number of the call:

- If the dialed number of the call is a toll-free service number (for example, 800 or 888), the *4ESS* switch provides toll-free service processing after receiving the SPResponse from the 2CCP/2NCP. The 2CCP/2NCP does not send a "Route to ALA" instruction for calls to toll-free service numbers. Continue with Step 3.
- If the dialed number of the call is a personal number service number (for example, 500), the *4ESS* switch provides personal number service processing after receiving the SPResponse from the 2CCP/2NCP. The 2CCP/2NCP does not send a "Route to ALA" instruction for calls to personal number service numbers; however, due to an abnormal condition the *4ESS* switch receives a "Route to ALA" instruction for a call to a personal number service processing or route to the ALA based on the Adjunct *Easy Reach*® Feature Interworking Service Indicator (ERFISI) per existing requirements. Continue with Step 3.
- Otherwise, the *4ESS* switch proceeds per existing requirements. Continue with Step 3.

3. Further processing is handled per existing requirements.

NOTE:
If the call is routed to the AT&T Trigger Platform for processing associated with the Leave-A-Message service, the SPResponse includes the necessary information for the *4ESS* switch to send subsequent queries back to the same 2CCP/2NCP, if necessary.

E. SP Service Identification Not Present

2.16 The *4ESS* switch takes actions based on the operations in the SPResponse message:

- If the SPResponse message includes a Caller Interaction - Play Announcement operation, the *4ESS* switch sends an early ACM once continuity is established and connects the call to the announcement indicated by the parameters of the Play Announcement operation.
- If the SPResponse message includes a Charging - Bill Call operation, the *4ESS* switch creates an AMA record for the call including the appropriate information from the Bill Call operation.
- If the SPResponse message includes a Connection Control - Connect operation, the *4ESS* switch connects the call using the routing information in the parameters of the Connect operation.
- If the SPResponse message includes a Connection Control - Disconnect operation, the *4ESS* switch final-handles the call using the information in the parameters of the Disconnect operation.

- If the SPResponse message or any subsequent TCAP message on the same transaction includes a Provide Instructions - Invoke Switch Capabilities operation, the *4ESS* switch takes action based on the content of the Switch Capability parameter:

If the Switch Capability value specifies	the switch does not apply
Apply *TrueVoice* ANI iPCC	*TrueVoice* to the call, using iPCC.
Apply *TrueVoice* ANI CSRO	*TrueVoice* to the call, using the CSRO option.
Apply 1+DL Blocking	Directory Link to the call.
Apply *QuietHear* Blocking	*QuietHear* to the call. (Note that this is an unexpected response for 2DSA/2NCP).

- Further processing is handled per existing requirements.

Default Handling

2.17 If the *4ESS* switch determines it must default-handle a call, it either final-handles the call or attempts to route and record it using the available destination number, depending on whether it is a data or voice call:

- If the call is a voice (including voiceband data) call, the switch attempts to route the call and generate an AMA record using the available destination number and existing routing and recording procedures, including any Local Number Portability (LNP) processing as appropriate. No 2CCP/2NCP (USDS) queries are sent. No 2DSA/2NCP queries are sent for PCP, SDN, or SDS service.

  Whether or not the switch sends an NAI query depends on whether the call is default-handled due to abnormal conditions or due to receipt of a Proceed - Normal instruction from the SD. If the call is default- handled due to receipt of a Proceed - Normal instruction, the switch uses its existing NAI procedures to determine whether or not to send an NAI query. If the call is default-handled due to abnormal conditions, no NAI query are sent.

- If the call is a switched digital data call, the switch final- handles it, consistent with existing procedures for data calls when the switch is unable to reach the SDS NCP.

3. Provisioning

Transition Plan

3.01 During transition from SD Phase 1 to SD Phase 2 for the PCP service, SPResponse messages supporting PCP service may be received by the *4ESS* switch with no SP Service Identification. Once the 2DSA/2NCP supporting PCP service is upgraded to support the SD Phase 2 capabilities, these calls have an SPResponse message sent to the switch with an SP Service Identification of PCP. There should be no difference in how these calls are treated by the switch.

3.02 PCP ANIs are provisioned in SD prior to the availability of SD Phase 2 in the *4ESS* switch or SD, and some ANI features are provisioned on these ANIs when the SD is upgraded to SD Phase 2.

3.03 General procedures for transition of services are consistent with those defined for SD Phase 1. The introduction of the "Revert to PMO" operation, however, provides an opportunity to improve the procedures for transition to reduce service impacts.

3.04 The procedures for transitioning a service at a switch defined for SD Phase 1 involve setting the SD Transition Status of a given SD Transition Type to SMO at a given switch and, at approximately the same time, setting the SD Transition Status for the related Precedence Index for that switch to SMO at the six SDs. However, it is expected that some small number of calls may encounter an abnormal condition (either default-handling without features, or the SP receiving two queries for a single call) due to the impossibility of setting the switch and six SDs to SMO at exactly the same time.

3.05 With the introduction of the "Revert to PMO" operation for calls which are identified to have an SD Transition Status of PMO in the SD, these abnormal conditions are eliminated. The procedure for service transitions can be modified by specifying that the *4ESS* switch should be set to SMO for a short time before any of the SDs are so set. This results in the *4ESS* switch waiting for the SDResponse message, and receiving a "Revert to PMO" operation in the SDResponse message. The switch therefore performs PMO processing on the call, querying the SP if appropriate. When, a short time later, the SD is set to SMO, the *4ESS* switch receives a "Wait for Instructions" operation in the SPResponse message, and the SD queries the SP.

A. ODA Structures Affected

OD4SDTRSTATTBL Structure

3.06 This structure begins at word d(36) of **AD4SDSTRUCT**. It contains the transition status indicators for the various SD transition types. A total of 64 status indicators are maintained; 16 in each of four words. The number of words in this structure is **4XLSDTRSTATREC(=4)**.

3.07 Two states apply to all 64 of the items. They are:

- **4ODSDTRSTAT_PMO** = **0** (default). All calls using existing call processing.
- **4ODSDTRSTAT_SMO** = **1**. The call uses SD-based call processing.

3.08 In Phase 1 of SD, the only indicator assigned was OD4SDTRSTAT_00 for PCP. With SD Phase 2, additional status indicators are needed for the transition types defined. The following is a list of the new and existing indicators:

Status Indicator	Planned Release
00 - PCP Transition Type Indication	4E22
01 - POTS Transition Type Indication	4E23R1
02 - SDN Transition Type Indication	4E23R2
03 - SDS Transition Type Indication	4E23R2
04 - USDS Transition Type Indication	4E23R3
05 - PCP Transition Type Indication	4E23R4
06 - *QuietHear* Transition Type Indication	4E23R4
07-63 - Unassigned	

B. Recent Change Forms Affected

RC Form 810

3.09 Data for FEATURE INFO is populated using RC Form 810. Entries can only be populated for AT&T offices. The associated Verify input and output messages are 16az and 6bk.

4. AMA Recording (Not Affected)

5. Network Management

New Measurements

5.01 The SD feature, Phase 2, introduces several new measurements. In each case, a 5-minute count and an hourly count are involved. The 5-minute counts are sent to Network Management Operations System (NEMOS), while the hourly counts are generated for access by Dynamic Engineering Mechanized System/Data Acquisition Reports and Integrated Communications System (DEMS/DARICS).

5.02 Table 4-A shows the measurements for the number of calls for which the SD Query is blocked because of the *4ESS* Pre-SDQuery control and which will receive final handling treatment.

Table 4-A. SD Query Blocked Measurements

Measurement	Description
PreSDQ_Blocked_FHT	The SDQuery is blocked because of the Pre-SDQuery control and which will receive final handling treatment.
PreSDQ_Blocked_Def	Counts the number of calls for which the SDQuery is blocked because the switch Pre-SDQuery control and which are default-handled.

5.03 Table 4-B shows the measurements and service indicators of calls which the switch default handles due to the receipt of a Proceed message with a Reason Code indicating "Manual Control", on a per-Service Indicator basis.

Table 4-B. Manual Control Measurements

Measurement	Service Indicator
PCP_MC	PCP
NISGen_MC	NIS-general
SPx_MC	Spares 1-10

5.04 Table 4-C shows the measurements and service indicators of calls which the switch default handles due to receipt of a Proceed message with a Reason Code indicating "Application Overload Control", on a per-Service Indicator basis.

Table 4-C. Application Overload Control Measurements

Measurement	Service Indicator
PCP_AOC	PCP
NISGen_AOC	NIS-general
SPx_AOC	Spares 1-10

5.05 Table 4-D shows the measurements and service indicators of calls directed to a service processor by SD.

Table 4-D. Calls Directed to a Service Processor Measurements

Measurement	Service Indicator
Calls_Directed_To_NISGen	NIS-general
Calls_Directed_To_SPx	Spares 1-10

5.06 Table 4-E shows the measurements and service indicators of calls for which the *4ESS* switch is instructed to query a service processor, on a per-Service Indicator basis.

Table 4-E. Service Processor Query Measurements

Measurement	Service Indicator
Calls_Queried_For_PCP	PCP
Calls_Queried_For_PCP	NIS-general
Calls_Queried_For_SPx	Spares 1-10

5.07 Table 4-F shows the measurements and service indicators of calls for which the SP Response Timer expires.

Table 4-F. Response Timer Measurements

Measurement	Service Indicator
SPR_PCP_Timeout	PCP
SPR_NISGen_Timeout	NIS-general
SPR_SPx_Timeout	Spares 1-10

5.08 Table 4-G shows the measurements and service indicators of calls for which the incoming call is cleared while waiting for an SPResponse message, on a per_Service Indicator basis.

Table 4-G. Abandon Measurements

Measurement	Service Indicator
SPR_PCP_Abandon	PCP
SPR_NISGen_Abandon	NIS-general
SPR_SPx_Abandon	Spares 1-10

5.09 Table 4-H shows the measurements and service indicators of calls for which the SP Query Timer expires, on a per-Service Indicator basis.

Table 4-H. Query Timeout Measurements

Measurement	Service Indicator
SPQ_PCP_Timeout	PCP
SPQ_NISGen_Timeout	NIS-general
SPR_SPx_Timeout	Spares 1-10

5.10 Table 4-I shows the measurement and service indicators of calls default-handled due to an abnormal condition.

Table 4-I. Default-Handled Measurements

Measurement	Service Indicator
PCP_Calls_Default_Handled	PCP
NISGen_Calls_Default-Handled	NIS-general
SPx_Calls_Default-Handled	Spares 1-10

NOTE:
The following measurements from the SD Phase 1 are no longer supported:

- SPR_abandon
- SPQ_timeout
- SDR_query.

6. Maintenance/Troubleshooting

SD Test Query Capability

6.01 The SD Test Query capability defined for SD Phase 1 must be updated to reflect new capabilities provided by SD Phase 2. In particular, the SP Destination input must be modified to accommodate round robin SPQuery routing in SD.

Final Handling Codes

6.02 Four new Final Handling Codes (FHC) are associated with this feature. The FHC numbers and failure summaries are listed in Table 4-J.

Table 4-J. Final Handling Code Failures

FHC	Failure and Handling Method
629	**Last Normal Condition–**The call was determined to be SMO. **Irregular Condition–**Call encountered a default handling situation, and per requirements, data calls are killed. SD exception code on output indicates specific cause of failure, if applicable. **Handling–**The switch will idle all associated resources and kill call.
630	**Last Normal Condition–**Call was determined to have valid routing, and was determined to be SD query eligible. **Irregular Condition–**The switch detected a manual pre-SD query control which matched the called digits, or a Hard To Reach (HTR) control, and the digits were HTR. **Handling–**Final call, idle associated resources.
1976	**Last Normal Condition–**The call has been default-handled during SD processing. **Irregular Condition–**N/A. **Handling–**The only call type available indicates query an NCP, the switch is not allowed to do so.
2110	**Description–**A call eligible for SD encountered a non-fatal error. The exception code field indicates the specific error encountered. Call is not final handled - this is a call irregularity report only. This code occurs on calls generating a SD query for SD eligible calls. The call is determined to be SMO and the SD attempt incurred an exception causing the call to be routed and recorded without further SD processing. Specific reasons for exception are indicated on trap SD exception code fields. The call is allowed to proceed to the original called number.

7. Transition Considerations

Feature Dependencies and Interactions

7.01 This feature requires that the SD Phase 1, Feature 4564, be deployed on the *4ESS* switch.

Ubiquity

7.02 It is not necessary for all *4ESS* switches in the network to be running the 4E23 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)

Domestic End to End Class of Service (DECOS) Feature (4904)

5

Contents **Page**

Domestic End to End Class of Service (DECOS) Feature (4904)

5

1. Feature Description

1.01 This feature provides the capability for customers to specify how the trunk capacity between the *4ESS*™ switch and a Local Exchange Carrier (LEC) switch (end office or access tandem) or between the *4ESS* switch and the customer switching equipment should be allocated for different services. This includes traffic for both incoming and outgoing directions. Integrated trunk reservation ensures that each of these services gets as much of their allocation as they need. Capacity not needed by one service can be made available to other services that are seeing loads over their current allocation.

1.02 The primary application of Domestic End to End Class of Service (DECOS) in the AT&T Switched Network (ASN) is for ingress/egress routing. The ingress/egress portion of the network is where the AT&T switches connect to the LEC switches. DECOS improves the efficiency of trunk usage and protects levels of service to individual end offices.

1.03 DECOS includes the following capabilities:

- Class of Service Concepts
  - — Trunk sharing among services
  - — Virtual networks
  - — Bandwidth management.

- Real Time Network Routing Concepts
  - — Non-hierarchical selection of via routes, based on real time load
  - — Increased numbers of via routes can be handled.
- Automatic Provisioning.

1.04 This feature is based on two previous features, International End to End Class of Service (IECOS) and Class of Service/Real Time Network Routing (COS/RTNR). These features allowed the inter-toll networks and international networks to convert to a fully integrated, multi-service network.

1.05 The three main changes from ECOS to DECOS are:

- Expansion of number AREAS to 1023
- Provisionable DEL/PREFIX rules for alternate and overflow routes
- Allow ECOS calls to use Forced InterToll Routing (FITR) when applicable.

2. Call Flow

2.01 The DECOS feature may affect both incoming calls and outgoing calls. Incoming calls that arrive on trunks marked for the DECOS feature, may be blocked as a means of balancing traffic loads among competing traffic streams. Outgoing calls routed using DECOS may use a route chosen from a list of possible routes and may be selectively blocked.

Incoming DECOS Call Flow

2.02 The following is the incoming DECOS call flow:

(1) The Service Identity (SI) and Transport Capability (TC) of the call are determined.

(2) Check the Trunk Sub-Group (TSG) of Incoming Trunk (ICT) to see if it belongs to an ECOS route.

(3) The AREA of the call is derived from the far-end area marked on the TSG.

(4) The SI, TC, and direction are mapped to an ECOS Routing Pattern Identity.

(5) Current traffic status of call load on calls origination route is checked.

(6) If there is unreserved idle capacity or the call is using capacity reserved for its ECOS Routing Pattern Identity (ERPI), then traffic parameters for the route are updated to reflect new traffic status. Call processing continues with digit translation.

(7) If the call is using capacity reserved for another ERPI, then the call is blocked. Call processing continues with final handling treatment for the call.

Outgoing DECOS Call Flow

2.03 The following is the outgoing DECOS call flow:

(1) The SI and TC of the call are determined.

(2) Translation of routing digits for the call identifies an Multiple Routing Treatment Table (MRTT). It can also be triggered by a Routing Data Block (RDB).

(3) The destination AREA of the call is determined by the far-end area of the first TSG of the first Routing Data Block (RDB) of the MRTT, or the first TSG of the RDB.

(4) The SI, TC, and direction are mapped to an ERPI.

(5) The destination AREA is used to determine the alternate routes.

(6) An ECOS route is derived from the MRTT, if applicable, and the ECOS Route List.

(7) If the next route is allowable based on the ERPI value of the route and the route status, then the route is tried in Step 9. Otherwise, a load balancing algorithm is applied to each route in turn to determine whether idle capacity exists that may be used by the call.

(8) If a route is found with idle capacity for the ERPI of the call, then it is searched for a TSG with idle capacity that also supports circuit selection capabilities indicated, by the circuit selection capability preference levels of the call. If one is found, then the call is routed on a trunk in this TSG and parameters are updated to reflect new traffic on the route. If no such TSG is found, then trunk hunt continues with the next route on the list.

(9) If no route is found with idle capacity for the ERPI of the call, then the call is treated with normal egress busy processing.

3. Provisioning

Office Data Assembler (ODA) Structures

A. HT4ECS_ARL

3.01 Item XL4ECS_RL_PROV_DEL_PRE is expanded from 1 bit to 2 bits. Two new items are defined, XL4ECS_RL_PROV_PRE and XL4ECS_RL_PROV_DEL.

B. HT4ECS_ORL

3.02 Item XL4ECS_RL_PROV_DEL_PRE is expanded from 1 bit to 2 bits. Two new items are defined, XL4ECS_RL_PROV_PRE and XL4ECS_RL_PROV_DEL.

Recent Change Form 526

3.03 The DEL/PRE rules can be specified for each alternate and overflow route using RC Form 526. Population rules are as follows:

- If the PREFIX field is non-blank, then the DEL field must be non-blank.
- If both the PREFIX and DEL fields are blank, then XL4ECS_RL_PROV_PRE must be set to 0. Otherwise, set XL4ECS_RL_PROV_PRE to 3.

Verify Forms 5o and 5p

3.04 If XL4ECS_RL_PROV_PRE is set to 0, then output blank in the DEL field. Otherwise, output the decimal value of the DEL field.

4. Recording (Not Affected)

5. Network Management

5.01 Two minimum sets of controls are needed to facilitate Network Management for the DECOS Area environment:

- AREA Cancel
- ECOS Routing Table (ERT).

5.02 DECOS has the same network management capabilities as ECOS.

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 4E23

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. This feature will not affect egress routing until an AREA is defined and activated on the TSG.

8. Input/Output Manual Pages

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

- **VER:ECOS;OPT(ARL)**
- **VER:ECOS;OPT(ORL)**
- **VER:TSGLIST**.

Positive Look Up in Windowed Call Store Feature (5060)

6

Contents

Contents **Page**

Positive Look Up in Windowed Call Store Feature (5060)

6

1. Feature Description

1.01 The *4ESS*™ switch Positive Look Up (PLU) table performs 10- digit translations. The PLU is currently located in the Main Call Store (MCS) static memory of the *4ESS* switch. Increased usage and projected demand of the PLU tables indicate a potential problem in expanding the table to full capacity in MCS.

1.02 With the release of this feature, the PLU tables are being moved to Windowed Call Store (WCS), allowing the tables to grow to full capacity while freeing up memory in MCS. Existing call processing logic related to the PLU table is not affected.

1.03 Routing instructions are normally defined on a 6-digit NPA-NXX basis. To deviate from this routing and provide special routing for certain 10-digit numbers, the 10-digit numbers are entered in the PLU table along with their special routing instructions. When the *4ESS* switch encounters a 10-digit number in the PLU table, it performs the special routing instead of the usual routing.

2. Call Flow (Not Affected)

3. Provisioning

Structures Affected

A. HT4PLUCLD, HT4PLUCT, HT4PLULKP, HT4PLUF2LKP, and HT4PLUL2LKP

3.01 The head tables for these structures remain in MCS. When the PLU subtranslators are to be located in WCS, the headtables are populated with the backup disk address of the associated subtranslator. Programs that access the headtables call a 1B Processor-provided macro that converts the disk address into a core address. This format can be used by the 1B Processor WCS hardware. Unassigned headtable entries are set to 4ODXSUNASGN (=octal 77777777).

3.02 When the PLU subtranslators are to be in MCS, the headtables are populated as follows:

- Assigned entries contain the core address of the associated translator.
- Unassigned entries contain HT4ALLZERO.

B. HT4WCS2ID

3.03 The entries in this structure contain 1DKTRAN when the PLU subtranslators are in MCS and 1DKTRAN1 when they are in WCS. The mapping to the HT4WCS2ID entry is as follows:

PLU Structure	HT3WCS2ID Entry
HT4PLUCT	4XLSAPLUCT (=117)
HT4PLUCLD	4XLSAPLUCLD (=118)
HT4PLUKP	4XLSALKUP (=119)
HT4PLUF2LKP	4XLSAF2LKP (=120)
HT4PLUL2LKP	4XLSAL2LKP (=122).

ODA Forms Affected

3.04 A new field, **PLU_IN_WCS** (PLU in Windowed Call Store), is being added to Office Data Assembler (ODA) Form 406C. This field indicates if the PLU structures reside in MCS or WCS. The population rules are as follows:

- Valid entries = **Y, N** or **Blank.**
- When PLU_IN_WCS contains **Y**, the PLU tables are in WCS memory.

- When PLU_IN_WCS contains **N** or is left blank, the PLU tables are MCS memory.
- When PLU_IN_WCS contains **Y**, the NWCSMP field of Form 406C cannot be blank or contain 0 (zero). This field contains the number of WCS memory modules in an office (which must be equipped with WCS when selecting the PLU_IN_WCS option).

Recent Change Forms Affected

3.05 The layout of Recent Change (RC) Forms 300 through 305, 311, 327 through 330, 332, 333, 339, 340, 343, and 346 is not changing . However, the affected code for these forms uses the HT4WCS2ID structure to determine where the PLU structures are located. The population rules are as follows:

- If HT4WCD2ID = **1DKTRAN**, the corresponding subtranslators are in MCS.
- If HT4WCD2ID = **1DKTRAN1**, the corresponding subtranslators are in WCS.

Verify Forms Affected

3.06 The layout of Verify Forms 13b, 13f, 3a through 3g, 3v, 3w, 3z, 3ab, 3ac, 3ak, and 3al is not changing. However, the affected code for these forms uses the HT4WCS2ID structure to determine where the PLU structures are located. The population rules are as follows:

- If HT4WCD2ID = **1DKTRAN**, the corresponding subtranslators are in MCS.
- If HT4WCD2ID = **1DKTRAN1**, the corresponding subtranslators are in WCS.

4. Recording (Not Affected)

5. Network Management

A. Operations Systems Impact

Data Acquisitions Reports and Integrated Communications System/DEMS

5.01 The Data Acquisitions Reports and Integrated Communications System (DARICS) collects measurements from the *4ESS* switch and uses them to monitor and size various resources in the switch. DEMS is an application built on the data obtained from DARICS. It provides the tools used by Service Node Engineers to size the switch component.

B. Work Center Impact

Service Node Engineering

5.02 Service Node Engineering provides the forecasting support to provision and size the *4ESS* switch.

6. Maintenance/Troubleshooting

6.01 The Call Irregularity Message indicates if a call fails digit translations after accessing the PLU table. A special bit is set which indicates if the PLU table was accessed. This bit is read out only if the call fails to complete.

7. Transition Considerations

Limitations and Restrictions

7.01 This feature is dependent on deployment of WCS in an office. Moving the PLU table to WCS ***must*** be done on a *4ESS* switch generic boundary.

Ubiquity

7.02 It is not necessary for all *4ESS* switches in the network to be running the 4E23 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)

Network Support for 8YY Toll-Free NPAs Feature (5123)

7

Contents **Page**

Network Support for 8YY Toll-Free NPAs Feature (5123)

7

1. Feature Description

1.01 This feature is an extension of the 800 Number Exhaust Relief Feature (4656), which prepared network components to support additional toll-free Numbering Plan Area (NPA) numbers in 4E20 Release 4.

1.02 Because of time constraints in effect when Feature 4656 was deployed, not all network components were prepared to support the new NPAs. As a result, the network could provide support for only NPAs 888 and 877 (in addition to 800) at that time.

1.03 This feature provides toll-free NPA support for all network components. In addition, this feature provides changes to I800 calls that terminate to Stentor in Canada.

1.04 The assignment of toll-free NPAs is in the form 8YY, where YY = 00, 88, 77, 66, 55, 44, 33 and 22. Currently, NPAs 800 and 888 are in service, and 877 is scheduled to be opened in 1998.

Specific Feature Capabilities

1.05 This feature provides the *4ESS*™ switch with the following new capabilities:

- Call Processing—The switch will apply the same call processing to all 8YY NPAs as it currently does for NPAs 800 and 888.

- Modified Screen 800 functionality in the AT&T Trigger Platform (ATP)—All 8YY codes are treated as potential toll-free numbers. A list of parameters is included (one for each 8YY code). The parameter values indicate whether the code has been activated by the user or not. This capability will be supported and provisioned by Service NOW-Routing (SNOW-R).

  The *4ESS* switch will screen for active NPAs. In response to a Screen 800 action from the AT&T Trigger Validation (ATV), the switch will check whether the digit string (collected via an immediately-preceding Collect Digits action) is a 10-digit number, and whether the first 3 digits of the collected number are equal to any active 8YY digits.

  Currently, only NPAs 800, 888 and 877 are active in the ATV table.

  CAUTION:
  If a different toll-free NPA is activated (such as 866, 855, 844, 833 or 822), the original NPAs 800, 888 and 877 will be deactivated. You must enter Yes (on the appropriate 300 series RC form) for each of the original NPAs in order to maintain their active status in the ATV table.

- The switch will provide full 8YY support for the following:
  - — Forced Via Switch Routing (FVSR)/800 Dialed Number Trigger, which uses the FVSR Trigger Table (Hot Table).
  - — FVSR/NCP Trigger, which uses the CFA field of the I800 Billing data parameter.

  NOTE:
  The following capabilities are not needed for toll-free NPAs 866, 855, 844, 833 and 822:
  - The FVSR/ANITT for 800, 900, 700 and 500 Dialed Number Trigger, which has the dialed number populated in the ANI Trigger Table.
  - Reduction of double dip table (cache table), because new customers will be provisioned in the 2DSD/2NCP.

I800 Calls

1.06 Prior to this feature, I800 calls to Stentor in Canada used the following Action Point Numbering (APN) numbers and 7 digits: 299 + 7 digits for 800 numbers; 298 + 7 digits for 888 numbers; 060 + 7 digits for 877 numbers.

1.07 This feature eliminates the use of several APN numbers for 8YY toll-free calls to Stentor in Canada. Instead, all toll-free calls to the Stentor switch will use 299 + 7 digits. The terminating AT&T *4ESS* switch will delete the 299 number (as before) and append in its place the first 3 digits of the dialed number (received from the dialed number parameter in the Integrated Services Digital Network-User Part [ISUP] Initial Address Message [IAM]). This number will be outpulsed to the Stentor switch.

1.08 Feature 5123 is AT&T Proprietary, and is applicable only to domestic switches.

2. Call Flow (Not Affected)

3. Provisioning

New Call Type Indicators

3.01 A new Inward Wide Area Telecommunications Service (INWATS) call type indicator and a new Routing Data Block (RDB) call type indicator were created to support this feature.

3.02 The new INWATS call type indicator, is XL4CTITFRE populated via code-grouping Recent Change (RC) Forms 300-303. When the CALLTYP field is INW and ABC is 8YY, the new call type indicator XL4CTITFRE must be set to 4XLCTITFRE_Y.

3.03 A new AD2 field under CALL TYPE RDB is populated via the code-grouping RC Forms 300-304, 321, 332, 339, and 346. When CALLTYPE RDB is used, the AD2 field specifies the related RDB option 0-7, as shown in Table 7-A.

Table 7-A. AD2 Field for RDB CALLTYPE

AD2 Options	Comment
OP0	Unassigned (Default)
OP1	Delete 3 and Prefix 3 Digits
OP3	Unassigned
OP4	Unassigned
OP5	Unassigned
OP6	Unassigned
OP7	Unassigned

3.04 The RDB call type indicator is verified by Verify Forms 3a-3g, 3o, 3v, 3w, 3y, 3z, 3ab, 3ac, 3ak, and 3al, using the AD2 field (Allow AD2=OP0-OP7 for CALLTYP=RDB).

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 4E23 Release 1 Generic for this feature to be fully operational. In order for the RDB option provided by this feature to work, the switches that interface with the Stentor switch in Canada must be running the 4E22 Release 1 Generic.

Turn On/Turn Off Mechanism

7.02 This feature is turned on automatically by software deployment.

8. Input/Output Manual Pages (Not Affected)

II Digits/Service Category Fraud Prevention Feature (5129)

8

Contents **Page**

II Digits/Service Category Fraud Prevention Feature (5129)

8

1. Feature Description

1.01 This feature allows calls routed to the *4ESS*™ switch to be blocked based on information that includes the call's II (Information Indicator)/OLI (Originating Line Information) value and the call's Service Category (SC). The II digits are used with MF equal access signaling and correspond to the OLI parameter used with Integrated Services Digital Network User Part (ISUP) signaling.

1.02 Prior to this feature, the SC was not used to screen calls for blocking. The *4ESS* switch could block calls based only on the value of the II/OLI digits. This method is limited and inadequate, because it does not provide the needed selectivity. For example, it does not allow the switch to block certain Inward Wide Area Telephone Service (INWATS) calls and to allow others, such as 800-, 888-type calls; all INWATS calls, including 800-, 888-type calls, would be blocked.

1.03 It is expected that this new capability will prevent the revenue loss that occurs when non-INWATS calls (from public pay phones, for example) are routed fraudulently or erroneously from Local Exchange Carriers (LECs) to the switch.

1.04 Call blocking selectivity is provided by means of a provisionable mechanism that uses the combination of a call's SC and II/OLI value to route or block the call at the *4ESS* switch before it is answered. Blocked calls receive final handling (vacant code) treatment. A new Final-Handling Code, 2115, has been assigned.

Service NOW-Routing (SNOW-R)

1.05 The Service NOW-Routing (SNOW-R) platform supports the new Recent Change (RC) Form 348 (Figure 8-1), which was created for this feature. RC Form 348 allows technicians at the National Automatic Message Accounting Control Center (NAMACC) to add, change, and delete information to support this feature.

1.06 The NAMACC technicians can use the SNOW-R platform to establish a call or set of calls to be blocked by specifying, per switch, the combination of II/OLIs and Service Catagories which should be blocked.

1.07 This feature applies to domestic and international calls. However, it does not apply to calls the switch routes to the Operator Service Position System (OSPS), or other calls which have no Called Party Number, as provided by the Consolidated Access Traffic Feature (5308), which was introduced in 4E22 Release 3.

1.08 Feature 5129 is proprietary to AT&T.

2. Call Flow (Not Affected)

3. Provisioning

Recent Change Form 348

3.01 Recent Change Form 348 (Figure (8-1) was created in 4E23 Release 1 to support this feature. As described in the Feature Description, it is used by technicians at the NAMACC to specify whether a call with a specific II/OLI and Service Category combination will be blocked or allowed. An input of D will block (Deny) a call with the given II/OLI-SC combination. An input of A will not block (Allow) a call with the given II/II/OLI-SC combination. Each Service Category input defaults to A unless it is modified by a Recent Change input.

```
#  FORM 348  II DIGITS/SERVICE CATEGORY FRAUD PREVENTION
#  4E231>
RC:EA;NEW;OPT(IOSC),---:              II/OLI ---,

ORNU -----,


SERVICE CATEGORY TREATMENT

UNSP -,  ATAP -,  CUSP -,  CARP -,  CANP -,  HAWP -,  NWZ1 -, INW -,
DSD -,   DLT -,   TC -,    DA -,    IOP -,   TST -,   RSYS -, MSC1 -,
MSC2 -,  MSC3 -,  MSC4 -,  INCN -,  ALAP -,  CUTP -,  INCO -, EASC -,
ICIN -,  SC1 -,   SC2 -,   SC3 -,   SC4 -,   SC5 -,   SC6 -,  SC7 -,
SC8 -,   SC9 -,   SC10 -,  SC11 -,  SC12 -,  SC13 -,  SC14 -, SC15 -,
SC16 -,  SC17 -,  SC18 -,  SC19 -,  SC20 -,  SC21 -,  SC22 -, SC23 -,
SC24 -,  SC25-,   SC26 -,  SC27 -,  SC28 -,  SC29 -,  SC30 -, SC31 -,
SC32 -,  SC33 -,  SC34 -,  SC35 -,  SC36 -,  SDN -,   LDA -,  SSP -,
SPDI -,  MULT -,  MCPP -,  INET -,  SDND -,  QTM -,



REMARKS -------------------------------------------!




                      ASSOCIATED VERIFY MESSAGES

                   INPUT-13aw-VER:EA;SC:IIDIGITS!(eot)

                      INPUT-13ax-VER:EA;SC:OLI!(EOT)

                         OUTPUT-3aw-VER:EA;OPT(SC)
```

Figure 8-1. Recent Change Form 348

Verify Forms/Messages

3.02 Verify Form 13aw (Figure 8-2) is a new input message that is used to verify the II digits used with this feature. The message format is as follows:

VER:EA;SC:IIDIGITS aa!(EOT)

```
INPUT:                      VERIFY 13aw

    ex. 1        VER:EA;SC:IIDIGITS 00!(EOT)

    ex. 2        VER:EA;SC:IIDIGITS (22,55,99)!(EOT)

    ex.3         VER:EA;SC:IIDIGITS 00-99!(EOT)

OUTPUT:                     VERIFY 3aw



                  RECENT CHANGE INPUT SOURCE-FORM # 348
```

Figure 8-2. Verify Form 13aw

3.03 Verify Form 13ax (Figure 8-3) is a new input message that is used to verify the OLI digits used with this feature. The message format is as follows:

VER:EA;SC:OLI aaa!(EOT)

```
INPUT:                      VERIFY 13ax

    ex. 1        VER:EA;SC:OLI 00!(EOT)

    ex. 2        VER:EA;SC:OLI (22,139,255)!(EOT)

    ex.3         VER:EA;SC:OLI 0-255!(EOT)

OUTPUT:                     VERIFY 3aw



                  RECENT CHANGE INPUT SOURCE-FORM# 348
```

Figure 8-3. Verify Form 13ax

3.04 Verify Form 3aw (Figure 8-4) is a new form to output the II/OLI digits for SC data.

```
INPUT:                  VERIFY 13aw

                VER:EA;SC;IIDGITS aa!(EOT)


                        VERIFY 13ax

                VER:EA;SC;OLI aaa!(EOT)


OUTPUT:                 VERIFY 3aw



VER:EA;OPT(IOSC),---:                      II/OLI ---,


SERVICE CATEGORY TREATMENT


UNSP -,  ATAP -,  CUSP -,  CARP -,  CANP -,  HAWP -,  NWZ1 -, INW -,
DSD -,   DLT -,   TC -,    DA -,    IOP -,   TST -,   RSYS -, MSC1 -,
MSC2 -,  MSC3 -,  MSC4 -,  INCN -,  ALAP -,  CUTP -,  INCO -, EASC -,
ICIN -,  SC1 -,   SC2 -,   SC3 -,   SC4 -,   SC5 -,   SC6 -,  SC7 -,
SC8 -,   SC9 -,   SC10 -,  SC11 -,  SC12 -,  SC13 -,  SC14 -, SC15 -,
SC16 -,  SC17 -,  SC18 -,  SC19 -,  SC20 -,  SC21 -,  SC22 -, SC23 -,
SC24 -,  SC25-,   SC26 -,  SC27 -,  SC28 -,  SC29 -,  SC30 -, SC31 -,
SC32 -,  SC33 -,  SC34 -,  SC35 -,  SC36 -,  SDN -,   LDA -,  SSP -,
SPDI -,  MULT -,  MCPP -,  INET -,  SDND -,  QTM -,


                  RECENT CHANGE INPUT SOURCE-FORM# 348
```

Figure 8-4. Verify Form 3aw

4. Recording

4.01 Automatic Message Accounting (AMA) recording is not required for calls blocked by the *4ESS* switch, except for Access Charge Verification if the call is selected (as is currently done for unanswered calls).

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

6.01 The *4ESS* switch provides final handling for blocked calls using a vacant code type of treatment. A new Final Handling Code, 2115, has been assigned. The Billing Number Failure classification is used in a call-irregularity printout.

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS* switches in the network to be running the 4E23 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. All II/OLI-SC combinations default to "Allow" until a Recent Change Form 348 input modifies it to "Deny".

8. Input/Output Manual Pages

8.01 The following new Input/Output pages were created to support this feature:

- **VER:EA-SC-OLI** (Input)
- **VER:EA-SC-IIDIG** (Input)
- **VER:EA-IOSC** (Output).

Positive Look Up TOols and Enhancements Feature (5163)

9

Contents **Page**

Contents **Page**

Positive Look Up TOols and Enhancements Feature (5163)

9

1. Feature Description

1.01 The Positive Look Up (PLU) table is a *4ESS*™ switch capability developed to perform 10-digit translations. Routing instructions are usually defined on a 6-digit (NPA-NXX) basis. The main capabilities of this feature are as follows:

- Tools that detect and diagnose call blocking in the *4ESS* switch. The tools indicate the presence of invalid linkages and supply sufficient information to resolve the problems.
- An increase in capacity of the PLU table to support features and services that require 10-digit translations. This increase is accomplished by using the available spare bits in the table, so that the maximum line numbers are increased without redesigning the PLU data structures.

1.02 The Positive Look Up TOols (PLUTO) can be run when:

- A final handling has PLU
- Any call processing activity finds a problem attributed to PLU
- Many Recent Change (RC) activities (for example, RC 346) have been performed on PLU.

NOTE:
Corrupted data that could be detected by PLUTO might go undetected after subsequent RC activities on PLU. Therefore, it is important to use PLUTO as frequently as possible to detect corrupted data and resolve the problems as soon as possible.

2. Call Flow (Not Affected)

3. Provisioning

A. Verify Forms Affected

Verify Form 3ax

3.01 Verify form 3ax has been modified to print additional information in the output message. This message is used to detect a failing PLU index. The PLU index is responsible for failing to route a call.

B. Input/Output Updates

Output Messages

3.02 The possible outputs for input message **VER:VFUNC PLUCHK** are as follows:

- The field FAILING PLU INDEX represents the PLU index retrieved from the code group table.
- The fields HT4PLUCLD through HT4PLU2LKP represent the indexes to the entry or word within the respective structures.
- The fields ADDR1 and ADDR2 represent the failing addresses in the program store memory.

  NOTE:
  The failure occurs immediately before these addresses (the convention usually adopted).

If ADDR1 = **NONE**, then ADDR2 should also be **NONE**. If ADDR1 represents an octal address, then ADDR2 is either **NONE** or an address. If ADDR2 represents an address, ADDR2 failed as a result of an ADDR1 failure. In the following examples, octal addresses are represented as A1 and A2.

C. Error Examples

Type 1

3.03 This error occurs when there are no PLU INDEXES or when there are no FAILING PLU INDEXES.

```
VER:CODEGRP;OPT(PLUCHK):                FAILING PLU INDEX:  NONE

                        ERROR INFORMATION

             TRANSLATOR                 INDEX(DEC)

             HT4PLUCLD                  NONE
             HT4PLUCT                   NONE
             HT4PLULKP                  NONE
             HT4PLUF2LKP                NONE
             HT4PLUL2LKP                NONE

             FAILED ADDR                VALUE(OCT)

             ADDR1                      NONE
             ADDR2                      NONE
```

Type 2

3.04 This error occurs when a PLU INDEX is retrieved, but fails to reach the CLD structure.

```
VER:CODEGRP;OPT(PLUCHK):                FAILING PLU INDEX:  X1

                        ERROR INFORMATION

             TRANSLATOR                 INDEX(DEC)

             HT4PLUCLD                  NONE
             HT4PLUCT                   NONE
             HT4PLULKP                  NONE
             HT4PLUF2LKP                NONE
             HT4PLUL2LKP                NONE

             FAILED ADDR                VALUE(OCT)

             ADDR1                      A1
             ADDR2                      A2
```

Type 3

3.05 This error detected a failure in the CLD entry index Y1. If not NONE, Y1 will always be equal to X1.

```
VER:CODEGRP;OPT(PLUCHK):                FAILING PLU INDEX:  X1

                        ERROR INFORMATION

             TRANSLATOR                 INDEX(DEC)

             HT4PLUCLD                  Y1
             HT4PLUCT                   NONE
             HT4PLULKP                  NONE
             HT4PLUF2LKP                NONE
             HT4PLUL2LKP                NONE

             FAILED ADDR                VALUE(OCT)

             ADDR1                      A1
             ADDR2                      A2
```

Type 4

3.06 This error detected a failure in a particular word (indicated by Y2) of the CT entry.

```
VER:CODEGRP;OPT(PLUCHK):                FAILING PLU INDEX:  X1

                        ERROR INFORMATION

             TRANSLATOR                 INDEX(DEC)

             HT4PLUCLD                  Y1
             HT4PLUCT                   Y2
             HT4PLULKP                  NONE
             HT4PLUF2LKP                NONE
             HT4PLUL2LKP                NONE

             FAILED ADDR                VALUE(OCT)

             ADDR1                      A1
             ADDR2                      A2
```

Type 5

3.07 This error detected a failure in a particular word of an entry in the LKP structure. Y3 points to the word where failure occurred.

```
VER:CODEGRP;OPT(PLUCHK):                FAILING PLU INDEX:  X1

                        ERROR INFORMATION

            TRANSLATOR                  INDEX(DEC)

            HT4PLUCLD                   Y1
            HT4PLUCT                    NONE
            HT4PLULKP                   Y3
            HT4PLUF2LKP                 NONE
            HT4PLUL2LKP                 NONE

            FAILED ADDR                 VALUE(OCT)

            ADDR1                       A1
            ADDR2                       A2
```

Type 6

3.08 This error detected a failure in the word of the CT entry. Y2 points to the particular word of the CT entry and is reached from Y3 (indicates a word in the LKP entry).

```
VER:CODEGRP;OPT(PLUCHK):                FAILING PLU INDEX:  X1

                        ERROR INFORMATION

            TRANSLATOR                  INDEX(DEC)

            HT4PLUCLD                   Y1
            HT4PLUCT                    Y2
            HT4PLULKP                   Y3
            HT4PLUF2LKP                 NONE
            HT4PLUL2LKP                 NONE

            FAILED ADDR                 VALUE(OCT)

            ADDR1                       A1
            ADDR2                       A2
```

Type 7

3.09 This error detected failure in the words (2-word) of an entry in F2LKP. It is accessed by Y4.

```
VER:CODEGRP;OPT(PLUCHK):                FAILING PLU INDEX:  X1

                        ERROR INFORMATION

             TRANSLATOR                 INDEX(DEC)

             HT4PLUCLD                  Y1
             HT4PLUCT                   NONE
             HT4PLULKP                  NONE
             HT4PLUF2LKP                Y4
             HT4PLUL2LKP                NONE

             FAILED ADDR                VALUE(OCT)

             ADDR1                      A1
             ADDR2                      A2
```

Type 8

3.10 This error detected failure in the word of an entry in L2LKP. This word is indicated by Y5. Y1 was retrieved first, followed by Y4 and then Y5.

```
VER:CODEGRP;OPT(PLUCHK):                FAILING PLU INDEX:  X1

                        ERROR INFORMATION

             TRANSLATOR                 INDEX(DEC)

             HT4PLUCLD                  Y1
             HT4PLUCT                   NONE
             HT4PLULKP                  NONE
             HT4PLUF2LKP                Y4
             HT4PLUL2LKP                Y5

             FAILED ADDR                VALUE(OCT)

             ADDR1                      A1
             ADDR2                      A2
```

Type 9

3.11 This error detected failure in the word of an entry in the CT structure. This word is reached after reaching Y1, followed by Y4, Y5, and finally Y2.

```
VER:CODEGRP;OPT(PLUCHK):                FAILING PLU INDEX:  X1

                        ERROR INFORMATION

            TRANSLATOR                  INDEX(DEC)

            HT4PLUCLD                   Y1
            HT4PLUCT                    Y2
            HT4PLULKP                   NONE
            HT4PLUF2LKP                 Y4
            HT4PLUL2LKP                 Y5

            FAILED ADDR                 VALUE(OCT)

            ADDR1                       A1
            ADDR2                       A2
```

Type 10

3.12 A PLU Index of 0 (zero) is always invalid, even though it may route a call successfully. Therefore, it is always printed as an error without further checking the validity of that index.

```
VER:CODEGRP;OPT(PLUCHK):                FAILING PLU INDEX:  0

                        ERROR INFORMATION

            TRANSLATOR                  INDEX(DEC)

            HT4PLUCLD                   NONE
            HT4PLUCT                    NONE
            HT4PLULKP                   NONE
            HT4PLUF2LKP                 NONE
            HT4PLUL2LKP                 NONE

            FAILED ADDR                 VALUE(OCT)

            ADDR1                       NONE
            ADDR2                       NONE
```

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Feature Dependencies

7.01 This feature works with Feature 5060, *Positive Look Up in Windowed Call Store*. Feature 5060 (in this generic release) moves the PLU tables from Main Call Store to Windowed Call Store.

Ubiquity

7.02 It is not necessary for all *4ESS* switches in the network to be running the 4E23 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)

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

10

Contents **Page**

Contents **Page**

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

10

1. Feature Description

1.01 This feature has been assigned to control additional testing in the 4E23 Release 1 Generic. The feature provides a new YES/NO Trunk Sub-Group (TSG) indicator, new Information Indicators (II), and new Originating Line Information (OLI) indicators. It also adds a new field to the Country Code Conversion Translator if RESELL applies to a country code. Also, for the 4E22 Generic to the 4E23 Generic retrofits, the value of the new TSG indicator has been moved from a 4E22 location to a 4E23 location.

1.02 The Carrier Solutions CIC Based Determinations Feature (5198/5754), described in 4E22 Release 1 Product Release Document 234-090-221AC, allows AT&T to offer long distance transport services to resellers based on the Carrier Identification Code (CIC). With CIC based determination, AT&T informs the Local Exchange Carrier (LEC) to route the reseller carrier's traffic on the 10288 switched access trunk groups to the *4ESS*™ switch. AT&T is aggressively pursuing the Regional Bell Operating Companies (RBOCS) and GTE as wholesale AT&T customers, or resellers, to reduce the effect of market share erosion on revenues and unit network costs.

2. Call Flow (Not Affected)

3. Provisioning

Structures Affected

A. HT4TSG Structure

3.01 A new YES/NO Trunk Sub-Group (TSG) indicator has been identified for this feature. The new item (4XLTS_CCTT) has been copied into the call register. A new field, CCTT, populates this item. Valid entries are blank, **Y**, or **N**. This new field is present on RC Forms 100, 101, 107, and 108 and Verify Forms 1a, 1b, and 11d. These RC Forms and associated Verify Forms are used with 1-Way Incoming TSGs and 2-way TSGs.

B. HT4CCCONV Structure

3.02 A new 1-bit item (XL4CC_RESELL) has been defined for this feature. A new field, RESELL, populates this item with valid entries being blank, **Y**, or **N**. This new field is present on Recent Change (RC) Form 317 which is used for adding a country code. The associated Verify Forms are 13n and 3m. The Verify Form output is either **N** or **Y** for this item.

C. HT4IIDIG and HT4OLI Structures

3.03 The HT4IIDIG structure has grown to 200 words and the entry size has grown from one word to two words.

3.04 Eight new 1-bit items (XL4II_R_5 through XL4II_R_12) have been defined for this feature. Eight new fields (R_3 through R_10) have been added to Verify Form 3af to support these items. One new field, RESELL, is added to RC Form 334 which is used for changing equal access signaling II digits and/or OLI values. The associated Input Verify Form is 13n. Population rules for RC Form 334 are based on II values entered and the digit count, with valid entries being **N** or **Y**. The Verify output is either **N** or **Y** for these items.

3.05 Four new 1-bit items (XL4OLI_R_0 through XL4OLI_R_X) have been defined for this feature. Population rules for RC Form 334 are based on the OLI values entered and the digit count. Valid entries are **N** or **Y**. Four new fields, R_0, R_3, R_10, and R_X have been added to Verify form 3ag to support this item. The Verify output is either **N** or **Y** for these items.

Recent Change Forms Affected

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

3.06 A new field, CCTT, has been added to these Recent Change (RC) Forms. This field indicates whether or not to resell a call and can have the following values:

Y = resell. Blank or **N** = do not resell. The default is **N**.

B. Recent Change Form 317

3.07 This Form is used to block Universal International Freephone Number (UIFN) calls (011+800+8 digits). A new field, RESELL, has been added to this Form to allow, or not allow, a call. This Form provides the capability to screen out particular dialed number country codes for resell calls. The default value is to allow dialed number country codes that are not provisioned in the Country Code Conversion Table for resell calls. The RESELL field can have the following values:

Y = Allow resell. **N** = Do not allow resell. The default is **Y**. Blank is allowed on RC Form 317 and its function is the same as **Y** or yes.

C. Recent Change Form 334

3.08 A new field, RESELL, has been added to this Form to allow, or not allow, a call. This Form provides the capability to screen out particular II and OLI digits for resell calls. The default value allows II/OLI values that are not provisioned in the II/OLI Tables for resell calls. The RESELL field can have the following values:

Y = Allow resell. **N** = Do not allow resell. The default is **Y**. Blank is not allowed on this Form.

Verify Forms Affected

A. Verify Forms 1a and 1b

3.09 One new field, CCTT, has been added to these Verify Forms to support the 100–series RC Forms for 1-way incoming, and two-way TSGs.

Valid entries are **Y** or **N**.

B. Verify Form 11d

One new field, CCTT, has been added to this Verify Form to support the 100-series RC forms for 1-way incoming, and two-way TSGs. Valid entries are **Y** or **N**.

C. Verify Form 3m

3.10 A RESELL field has been added to support RC Form 317.
Valid entries are **Y** or **N**.

D. Verify Form 13n

3.11 A RESELL field has been added to support RC Form 334. Valid entries are **Y** or **N**.

E. Verify Form 3af

3.12 Eight new fields, R_3 through R_10, have been added to this Verify Form to reflect population changes on RC Form 334 for related II fields.
Valid entries are **Y** or **N**.

F. Verify Form 3ag

3.13 Four new fields, R_0, R_3, R_10, and R_X have been added to this Verify Form to reflect population changes on RC Form 334 for related OLI fields.
Valid entries are **Y** or **N**.

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 to be running the 4E23 Release 1 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

7.02 This feature is turned on by software deployment and by selecting ON/OFF bits on Recent Change Forms associated with Feature 5198, Carrier Solutions Carrier Identification Code (CIC) Based Determination Feature.

7.03 Recent Change Forms 100, 101, 107, and 108 have a new field, CCTT, which should be set to **Y** for resell. **N** = do not resell. The default is **N**. The functions of the RC Forms containing the new CCTT field are as follows:

- RC Form 100 — Adding a New Two Way Trunk Sub-Group
- RC Form 101 — Adding a New One Way Incoming Trunk Sub-Group
- RC Form 107 — Changing a Two Way Trunk Sub-Group
- RC Form 108 — Changing a One Way Incoming Trunk Sub-Group.

7.04 The RC form 317 is used to block Universal International Freephone Number (UIFN) calls (011+800+8-digits). A new field, RESELL, has been added to this Form to allow, or not allow, a call. This Form provides the capability to screen out particular dialed number country codes for resell calls. The default value is to allow dialed number country codes that are not provisioned in the country Code Conversion Table for resell calls. The RESELL field can have the following values: **Y** = Allow resell. **N** = Do not allow resell. The default is **Y**. Blank is allowed on RC Form 317 and its function is the same as **Y** or yes.

7.05 The RC Form 334 has a new field, RESELL, that allows or does not allow a call. This Form provides the capability to screen out particular II and OLI digits for resell calls. The default value allows II/OLI values that are not provisioned in the II/OLI Tables for resell calls. The RESELL field can have the following values: **Y** = Allow resell.
N = Do not allow resell. The default is **Y**. Blank is not allowed on this form.

8. Input/Output Manual Pages (Not Affected)

4ESS™ Switch 3B21D Attached Processor System Upgrade Feature (5222)

11

Contents **Page**

4ESS™ Switch 3B21D Attached Processor System Upgrade Feature (5222)

11

1. Feature Description

1.01 This feature provides a new 3B Processor (3B21D) that is used as the Attached Processor System (APS) for the *4ESS*™ switch. The 3B21D performs the following functions:

- Call Detail Recording and Teleprocessing
- Disk backup of all Call Detail Recording (CDR) data
- System disk backup and recovery of 1B Processor memory for files and data
- Recent Change (RC) and Verify interface for the 3B Common Network Interface (CNI) Direct Link Node (DLN) based data structures
- Switch interface to Operations Support Systems (OSS)
- Pseudo 1B Processor data channel for the OSS to interact with the 1B Processor through a 3B Input/Output (I/O) port
- Interface to the CNI ring
- Interface to the Call Detail Recording Platform (CDRP)
- Interface to the 1B Processor for Out of Band (OOB) signaling.

1.02 The introduction of the 3B21D processor permits the switch to perform the same functions as before, but at a higher overall switch capacity. The upgrade is both a hardware and software upgrade. There are two new manuals for the 3B21D: the *System Maintenance Manual* (254-303-106) and the *Hardware Reference Manual* (254-303-105).

1.03 The 3B Attached Processor System (APS) capacity is at a premium. The 3B20D is approaching exhaust in terms of real time, disk capacity is starting to run out, and software updates are too slow. A higher overall switch capacity is needed. The 3B20D has been Manufacture Discontinued (MD) and special maintenance support has been set up for it.

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 4E23 Release 1 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

7.02 This feature is turned on automatically with hardware and software deployment.

8. Input/Output Manual Pages (Not Affected)

Interim D-Channel Expansion Feature (5361)

12

Contents **Page**

Interim D-Channel Expansion Feature (5361)

12

1. Feature Description

1.01 This feature increases the number of D-Channel terminations in *4ESS*™ switches by equipping additional High Density Ring Node (HDRN) cabinets (maximum of 4) in the existing Common Network Interface (CNI) ring. The current Integrated Ring Node2 (IRN2) based hardware and software will continue being used.

1.02 Each new HDRN CNI ring cabinet is equipped with the five-node high density shelf (J3F011GA-1). Up to six shelves can be equipped per cabinet, with each shelf supporting up to 24 D-Channels. One pair of the cabinets provides an additional 288 D-Channels.

1.03 D-Channel terminations need to be increased because of fast- growing market segments, such as Frame Relay, Internet, Video Conference, Video Phone, and Multimedia.

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 4E23 Release 1 Generic for this feature to be fully operational.

Dependency

This feature is dependent on *3B20D Capacity Relief Feature (5222)* being implemented in the office.

Turn On/Turn Off Mechanism

7.02 This feature is turned on automatically by software and hardware deployment.

8. Input/Output Manual Pages (Not Affected)

Project Radar Phase 2 Feature (5532)

13

Contents

Contents **Page**

Project Radar Phase 2 Feature (5532)

13

1. Feature Description

1.01 This feature provides Phase 2 of a new AT&T Directory Information Service that offers customers the ability to get information other than telephone numbers for given names and addresses. Project Radar is planned to evolve into a long-term Directory Assistance (DA) service that will address both long distance and local DA services. It will also include Consolidated Access Traffic and Segmentation Directory capabilities.

1.02 This feature builds on the capabilities provided by Project Radar Phase 1 Feature (5517) and the AT&T 1+Directory Link (1+DL) Feature (3609), which was introduced in the 4E20 Release 1 Generic. It provides a number of service enhancements and improvements, including the following:

- Expanded Listing Services
- Enhanced AMA Recording
- Improved access for 1+NPA-555-1212 (1+DL)
- Efficient use of network resources through call completion from the Originating AT&T Switch (OAS) using CCS7 signaling.
- Reduced post-dial delay (PDD)
- Reduced Local Exchange Carrier (LEC) access charges
- Call completion offered after the listing number is obtained from the DA.

Background—Project Radar Phase 1 Capabilities

1.03 The capabilities that were introduced in Phase 1 of this feature are described in the following summary:

- The service architecture to offer direct-dialed basic and enhanced search services from the terminating *5ESS*® Switch Operator Service Position System (OSPS)-Listing Services (LS) was developed, and includes the following:
  - — Basic Services—Includes traditional phone number with optional address with Zip Code; non-NPA dependent phone number and address search; area Code and Country Code quotes; limited halo search; multiple look-ups per call per previously-noted search types; call completion at a rate that is different from 1+DIRECTory LINK Service.
  - — Enhanced Services—Includes Search until Find (continued halo search until the first occurrence of the requested party is located); Yellow Pages look-up for specific listings; call completion except when blocked by customer request.
- The infrastructure to accept and process 1-900-555-ABCD and 555-ABCD calls was developed.
- 0+900-555-1212 service was enhanced to make it more effective and to eliminate the potential for double billing.
- 1-800-CALL-ATT/Prompt 4 (DA) was modified to become a more viable application. Listing Service function is now provided by the AT&T *5ESS* switch OSPS-LS.
- Ground work required to accept, and eventually process and bill the following calls:
  - — 00/0 Enhanced Voice Recognition Call Processing (VRCP) to support 0+900-555-ABCD.
  - — 0+900-555-ABCD
  - — 0+555-ABCD (0+NPA-555-ABCD)
  - — 0+NPA-555-1212 (limited enhanced services with a flat rate).

Overview—Project Radar Phase 2 Capabilities

1.04 The following capabilities are provided by Phase 2 of this feature:

1. Enhanced search capabilities including: State Level, Regional, Reverse, Category, Locator and Batch.

2. Information fulfillment including: FAX-back and Call-back.
3. Automatic Message Accounting (AMA) Recording Enhancements.
4. Billing Enhancements including: Business Discounting and Multi-Tiered Pricing.
5. Expanded Listing Services Database Content per the following:
   - 500, 800 and 900 Numbers
   - Electronic Addresses
   - Listings for Locator Services
   - Cellular Numbers
   - Fax Numbers
   - Pager Numbers and PINs.
6. Call completion offered after the listed number is obtained from the DA platform for all DA calls.

   NOTE:
   900-555-12XX calls currently use the routing number retrieved through High Capacity (HICAP) tables and, as such, are not eligible to offer Call Completion.

7. Enhanced Provisioning System per the following:
   - Reverse Search Block on Automatic Number Identification (ANI)
   - ANI Blocking of Call Completion.
   - Customer Self-Provisioning.
8. Enhanced Direct Measure of Quality Reports—Assess Service Performance.

4ESS™ Switch Capabilities

1.05 The following *4ESS*™ switch capabilities are required to support this feature:

1. The *4ESS* switch processes the following new Integrated Services Digital Network User Part (ISUP) parameters:
   - Redirect Capability parameter (sent in the forward direction of the call).
   - Redirection Number parameter (received from the terminating *5ESS* switch OSPS-LS; relayed back to the originating *5ESS* switch OSPS-Toll and Assist (TA) for OSPS Toll and Assist calls).

- DA Generic Operations Parameter (GOP) with a Type of Operation of Call Completion Billing Information (received from the terminating *5ESS* switch OSPS-LS; relayed back to the originating *5ESS* switch OSPS-TA for OSPS Toll and Assist calls).
- DA GOP with a Type of Operation of DA Billing Information (received from the terminating *5ESS* switch OSPS-Listing Services; relayed back to the originating *5ESS* switch OSPS-TA for OSPS Toll and Assist calls).
- DA GOP with a Type of Operation of Call Completion Offer Indicator (sent to the terminating *5ESS* switch OSPS-Listing Services in the forward direction of the call).

2. The switch can receive and process a Call Progress message from the terminating *5ESS* switch OSPS-Listing Services after an Answer message has been received.
3. The switch can receive a Release message with a Cause Indicator parameter with a Cause Value of 23.
4. The switch appends the AMA information received in the ISUP Call Progress message to AMA records (multiple 343 modules).
5. The switch maps the ISUP Release message, received from the terminating *5ESS* switch OSPS-Listing Services, into a Q.931 **DISCONNECT** message that is sent to the Consumer Long Distance (CLD) adjunct on the B2 leg. The following parameters are mapped:
   - Redirection Number (Listed Number)
   - Cause Indicator parameter with Cause Value of 23
   - DA GOP parameter with Type of Operation of Call Completion Billing Information (with appropriate billing information).
6. The switch appropriately sets the Call Completion indicator in the DA GOP parameter which is included in the Initial Address Message (IAM) that is forwarded to the terminating *5ESS* switch OSPS, based on the ANI Trigger Table indicator for 1+DL Block.
7. The switch appropriately sets the 1+DL Block indicator in the Q.931 SETUP message on the B1 leg, based on the ANI Trigger Table indicator for 1+DL Block.
8. The switch maps the ISUP Redirect Capability parameter into the Q.931 **SETUP** message that is sent to the CLD adjunct on the B1 leg.
9. The switch maps the Transaction Capabilities Application Part (TCAP) containing the 1+DL Block indicator received from either the Universal Data Structure (USDS), Positive Call Processing (PCP)/Network Control Point (NCP), or Segmentation Directory (SD) into a Q.931 **SETUP** message that is sent to the CLD adjunct on the B1 leg. This applies when the CLD adjunct is directly connected to the originating AT&T switch.

10. The switch maps the TCAP parameter containing the 1+DL Block indicator received from either the USDS, PCP/NCP, or SD into an ISUP GOP that is sent in an IAM in the forward direction of the call.
11. The switch maps the ISUP GOP containing the 1+DL Block indicator into a Q.931 **SETUP** message that is sent to the CLD adjunct on the B1 leg. This applies when Remote Adjunct Call Handling (REACH) is used to get to a CLD via a Handoff AT&T Switch (HAS). The originating AT&T switch sends the ISUP GOP in an IAM to the HAS; the HAS then maps the ISUP GOP into a Q.931 **SETUP** message.
12. The switch maps the Redirect Capability parameter, received from the CLD adjunct in a Q.931 **SETUP** message on the B2 leg, into an ISUP Redirect Capability parameter in an outgoing IAM.
13. The switch maps the 1+DL Block indicator, received from the CLD adjunct in a Q.931 **SETUP** message on the B2 leg, into an ISUP Redirect Capability parameter in an outgoing IAM.
14. The switch maps the 1+DL Blocking indicator, received from the CLD adjunct in a Q.931 **DISCONNECT** message on the B1 leg, into an ISUP GOP parameter.
15. The switch maps the Redirect Capability parameter, received from the CLD adjunct in a Q.931 **DISCONNECT** message on the B1 leg, into an ISUP Redirect Capability parameter.

NOTE:
This feature is related to the Early Disconnect Handling for Project Radar Feature (6468), which is included in 4E23 Release 1. For additional information, refer to the Recording section of this chapter and to the chapter for Feature 6468 in this document.

2. Call Flow

0- and 0+ 10-Digit Access

2.01 The call flow for 0- and 0+ 10-Digit Access is as follows:

1. A request for access is initiated when a caller dials a number that is recognized in an originating OSPS as a Listing Services or Enhanced Listing Services service application number (using functionality that was introduced in Phase 1 of this feature).
2. The call is received by the *5ESS* switch OSPS from the LEC end office on a trunk group that uses Modified Operator Services MF signaling. The ANI, II digits and Called Party Number are passed.

3. The OSPS prompts the caller for acceptable billing, based on existing, pre-determined class-charge restrictions.
4. The originating *5ESS* switch OSPS-Toll and Assist determines whether the call should receive a Call Completion Offer (a capability introduced in Phase 1 of this feature).
5. The originating *5ESS* switch OSPS-Toll and Assist routes the call to an originating AT&T *4ESS* switch, using CCS7 ISUP signaling. The following key information is included in the IAM:
   - The Called Party Number (containing the translated Routing Number), and the Nature of Address Indicator is set to National Number.
   - Charge Number Parameter (if applicable).
   - Originating Line Information (OLI) parameter, if received from the LEC end office.
   - A Redirect Capability parameter, indicating that redirection is possible at any time during the call (bits CBA of the Redirect Capability parameter are set to 011).

     NOTE:
     The Redirect Capability parameter is new. It was created as part of a new Redirection ISUP procedure being developed by the International Telecommunications Union.

   - Directory Assistance GOP parameter, with a Call Completion Offer Indicator Type of Operation. Based on Step 4 above, this parameter is set to either Allow or Block.
6. The originating AT&T *4ESS* switch performs screening functions and routes the call through the AT&T network to a terminating AT&T *4ESS* switch, using existing CCS7 ISUP signaling. All of the key IAM information listed in Step 5 above is forwarded.
7. The terminating AT&T *4ESS* switch uses CCS7 ISUP signaling to send the call to the terminating *5ESS* switch OSPS-Listing Services. The IAM contains all of the key information listed in Step 5 above, with the Nature of Address Indicator of the Called Party Number set to Operator Requested, National Number.
8. The terminating *5ESS* switch OSPS-Listing Services accepts the request. Screening identifies the Call Type.
9. The terminating *5ESS* switch OSPS-Listing Services returns an immediate Address Complete Message (ACM) to the terminating AT&T switch, which allows for a cut-through connection for the voice path in both directions.

10. The terminating *5ESS* switch OSPS-Listing Services forwards the call to the DA platform, using a Call Processing Data Link (CPDL) message (position seizure message).
11. The terminating *5ESS* switch OSPS-Listing Services returns an Answer Message (ANM) to the terminating AT&T switch when a DA position is seized.
12. The DA agent determines from the caller the desired DA service (such as basic listing service or enhanced search), and queries the database.
13. When the desired service is identified, a Release to Audio message is sent from the agent to the Listing Service Database (LSDB) via Release to Audio Key. This transfers the call to an Automatic Response Unit (ARU), and call flow proceeds as follows:
    - If the caller hangs up early before receiving all of the requested listings, the originating *5ESS* switch OSPS-Toll and Assist sends a Release message to the terminating *5ESS* switch OSPS-Listing Services. The *5ESS* switch OSPS-Listing Services then goes into a pseudo-hold system state. The DA agent, recognizing that the calling party has gone on-hook, presses the Position Release key. The originating *5ESS* switch OSPS-Listing Services creates a DA AMA record at a flat rate, since the search type and count of information requested prior to the caller hanging up are not received by the OSPS-Toll and Assist. The call flow ends when this occurs.
    - If the caller remains on the call (there is no early disconnect), proceed to Step 14.
14. A CPDL message is sent form the Listing Services Database to the terminating *5ESS* switch OSPS-Listing Services. The CPDL message requests that the call be transferred to an ARU. The message also includes all of the necessary data modules, and identifies the type of listing service requested and the listing information.
15. The terminating *5ESS* switch OSPS-Listing Services formulates a Call Progress Message (CPG) and sends it to the originating *5ESS* switch OSPS-Toll and Assist. The CPG message includes the following key information:
    - The Cause Indicator parameter with a Cause Value set to 23.
    - The DA GOP with Operation Class of Directory Assistance, and Type of Operation of DA Billing Information. This parameter contains DA AMA billing information such as the search types and count of each search type. It also includes an information identifier that is used to identify the feature/service (Table 481).
16. The terminating *5ESS* switch OSPS-Listing Services sends the Listing Services Database one of the following messages: An ARU Port Select message or a Call Completion ARU Port Select message.

17. The terminating OSPS-Listing Services begins the redirection procedure by checking the Redirect Capability parameter to determine if redirection is possible in the current call state.
18. DA Call Completion is offered to the caller.
19. If the caller responds No to the offer, the ARU or the DA agent (if the listed number is giver verbally) goes on-hook. The terminating *5ESS* switch OSPS-Listing Services uses CCS7 release procedures that apply when the called party or the calling party hangs up first.
20. The originating *5ESS* switch OSPS-Toll and Assist generates an appropriate DA AMA record, based on the information received in the CPG message. Call flow ends at this point when the caller declines the Call Completion offer.
21. If the caller responds Yes, Listing Services Database notifies the terminating *5ESS* switch OSPS-Listing Services via a CPDL (a Complete Call message to the *5ESS* switch OSPS-Listing Services).
22. The terminating *5ESS* switch OSPS-Listing Services does not generate a DA Call Completion AMA record.
23. If redirection is possible, the *5ESS* switch OSPS releases the call back to the originating OSPS by sending a Release message. The following key information is contained in the Release message:
    - The Cause Indicator parameter with a Cause Value of 23.
    - The redirection number (listed number).
    - The DA GOP with Type of Operation of Call Completion Billing Information. This contains the code identifying the type of DA service that requested call completion and the Means of Input.
24. The originating *5ESS* switch OSPS-Toll and Assist (the redirecting switch) performs billing validation for call completion and a new IAM is constructed, after receiving the Release message with Cause Value 23. The new IAM includes the Called Number Party parameter populated with the new destination number.
25. The originating *5ESS* switch OSPS-Toll and Assist generates a DA AMA record when the caller accepts the Call Completion offer.
26. The call is forwarded to its final destination, based on the listed number contained in the Release message.
27. The originating *5ESS* switch OSPS-Toll and Assist receives an ACM and an ANM from the new leg of the call.
28. The originating *5ESS* switch OSPS-Toll and Assist does not pass back the new ACM and ANM messages.

29. The call continues until either the calling party or the called party hangs up. Existing CCS7 release procedures apply.
30. The originating *5ESS* switch OSPS-Toll and Assist generates a call completion AMA record.

0+ 7-Digit Access

2.02 The call flow for 0+ 7 Digit Access is as follows:

NOTE:
This call flow is similar to the call flow for 0+ 10 Digit Access, described above. The only difference is in Step 5.

1. A request for access is initiated when a caller dials a number that is recognized in an originating *5ESS* switch OSPS-Toll and Assist as a Listing Services or Enhanced Listing Services application number.
2. The originating *5ESS* switch OSPS-Toll and Assist receives the call from the LEC end office on a trunk group that uses Modified Operator Services MF signaling. The ANI, II digits and the called number are passed.
3. The originating *5ESS* switch OSPS-Toll and Assist prompts the caller for acceptable billing, based on existing, pre-determined class-charge restrictions.
4. The originating *5ESS* switch OSPS-Toll and Assist determines if the call should receive a Call Completion offer.
5. The originating *5ESS* switch OSPS-Toll and Assist prepends the home NPA to the 555-ABCD. It then routes the call to an originating AT&T *4ESS* switch using CCS7 ISUP capabilities. The IAM includes the following key information:
   - The Called Party Number containing the translated Routing Number.
   - The Charge Number parameter (if applicable).
   - The OLI parameter (if one is received from the LEC end office).
   - A Redirect Capability parameter indicating redirection is possible at any time during the call.
   - The DA GOP parameter with Type of Operation of Call Completion Offer Indicator. This parameter is set to either Allow or Block, based on Step 4.
6. The call flow from this point to the conclusion of the call is the same as for 0-and 0+ 10-Digit Access, starting from Step 6 above.

1+ 800-CALL-ATT, Prompt 4

2.03 The call flow for 1+ 800-ATT, Prompt 4 calls is as follows:

1. A caller dials 1-800-225-5288.
2. The call is routed from the LEC to the AT&T Switched Network.
3. Existing advanced 800 routing is used to route the call to the appropriate OSPS.
4. The terminating *4ESS* switch selects a CCS7 Trunk Group Number (TGN) to compete the call to the originating OSPS-Toll and Assist.
5. The request is recognized as a 1+ 800-CALL-ATT call, based on OSPS-Toll and Assist data.
6. The caller is prompted by the Shared Adjunct Resource Platform (SHARP) to select a class charge or service-specific prompt.
7. A DTMF entry of 4 causes the OSPS to send a "Bong" to the caller, followed by the standard Automated Calling Card Services (ACCS) announcement.
8. The remainder of the call flow for this type of call is the same as for 0-/0+ 10-Digit Access, starting with Step 4, above.

NOTE:
There are no changes to the existing *QuietHear* controls applied to 1+800-CALL-ATT calls.

1+ DA Calls

NOTE:
900-555-12XX calls currently use the routing number retrieved through High Capacity (HICAP) tables and, as such, are not eligible to offer Call Completion.

2.04 The call flow for 1+ DA Calls (1+ NPA-555-XXXX, 1+ 900-555-XXXX, 1+ 555-XXXX) is as follows:

1. A caller dials a 1+ DA number (1+ NPA-555-XXXX, 1+ 900-555-XXXX, or 1+ 555-XXXX).
2. The originating AT&T *4ESS* switch receives the call from the LEC end office on a 2-way trunk group that uses either CCS7 ISUP or Equal Access MF signaling.
3. If the signaling is CCS7 ISUP, the *4ESS* switch receives an IAM, which contains all of the appropriate CCS7 Network Interconnect parameters, including these key parameters:

- The Called Party Number with Nature of Address Indicator set to National Number
- The Charge Number containing the ANI
- The Originating Line Information.

4. If the signaling is Equal Access MF (Feature Group D MF), the ANI, II digits and the Called Party Number are sent.
5. The originating *4ESS* switch checks the office parameter that controls the on/off status of this feature (Feature Item PF44 on Recent Change Form 809). If PF44 is set to OFF, the *4ESS* switch proceeds per existing call processing procedures, and call flow ends at this point.
6. If PF44 is set to ON, the *4ESS* switch determines if the call is a DA call, based on the Called Party Number received from the LEC.
7. For calls that occur prior to Segmentation Directory Phase 2, the originating *4ESS* switch performs an ANI Trigger Table look-up. For calls that occur in Segmentation Directory Phase 2 or later, the *4ESS* switch sends an SD query to the Segmentation Directory.
8. If the call is a PCP call, a TCAP query is launched to the NCP. The 1+ DL eligibility for PCP calls is determined at the NCP and relayed back to the *4ESS* switch in a TCAP response query. Proceed to Step 13.
9. If the call is eligible for a USDS query, a TCAP query is launched to the USDS.

   NOTE:
   If the call occurs prior to SD Phase 2, USDS query eligibility is determined by the *4ESS* switch, which launches the query. For SD Phase 2 and later, eligibility is determined at the SD, which launches an SP query.

10. The USDS determines the following:
    - Whether 1+ DIRECTory Link Block applies
    - Whether Route to Adjunct Logical Address (ALA) applies
    - Whether Query Network Access Interrupt (NAI) applies.
11. The USDS sends the originating AT&T *4ESS* switch the following key information in an Instruction TCAP message:
    - Customer Connection ID (for pre-SD Phase 2 calls only)
    - Switch Capabilities Parameter with the following key bits:
      — ALA Parameter (included only when Bit D of the Switch Capabilities parameter is set)

— Bit B is set if 1+ DL Blocking applies

— Bit C is set if Query NAI applies

— Bit D is set if Route to ALA applies.

NOTE:
This feature allows bits B and D to be set concurrently. This was not allowed by the USDS prior to this feature, and the switch would ignore 1+ DL Blocking.

12. If requested by the USDS, the *4ESS* switch queries the NAI database.
13. Proceed to Step 16 if the caller's ANI is determined to be DL ineligible (1+ DL Blocking applies) and the call does not have Consumer Long Distance (CLD) Adjunct-based features.
14. If the caller's ANI is determined to be DL eligible (1+ DL Blocking does not apply) and/or the call has CLD Adjunct-based features, the call is routed to the CLD Adjunct as follows:
    - If the originating AT&T *4ESS* switch has a CLD Adjunct connected to it, the call is routed to the adjunct on the B1 leg. In addition to existing parameters, the Q.31 message to the adjunct includes the 1+ DL Block Indicator and the Redirect Capability parameter.
    - If the originating AT&T *4ESS* switch does not have a CLD Adjunct connected to it, the switch invokes Remote Adjunct Call Handling (REACH). This sends the call to a designated *4ESS* Hand-Off switch which has a CLD Adjunct connected to it. The ISUP IAM from the Hand-Off switch includes the Redirect Capability parameter and the 1+ DL Block Indicator GOP.
15. The CLD Adjunct recognizes the need for 1+ DL service and launches a call to the DA platform (on the B2 leg). In addition to existing parameters, the Q.931 **SETUP** message of the B2 leg includes the Redirect Capability parameter and the 1+ DL Block Indicator. The CLD Adjunct does not allocate ASR facilities for this call.
16. The *4ESS* switch routes the call through the AT&T Switched Network to a terminating *5ESS* switch OSPS-Listing Services, using CCS7 ISUP signaling. The IAM includes the following key information:
    - The Called Party Number containing the translated Routing Number. The Nature of Address Indicator is set to Operator Requested, National Number.

- The Charge Number parameter (includes the caller's ANI).
- A Redirect Capability parameter that indicates that redirection is possible at any time during the call.
- The DA GOP with Type of Operation of Call Completion Offer Indicator, which is set to either Allow or to Block, based on the results of one of the following: the USDS query response; the NCP query response for PCP calls; or the SD response for other types of calls.
- The Operator Systems Indicator with the Access Prefix Indicator field set to 1+ or 011+.

17. The terminating *5ESS* switch OSPS-Listing Services recognizes the call as a LOCDA, or other call type, based on the (Routing Number) digits in the Called Party Number.
18. The terminating *5ESS* switch OSPS-Listing Services returns an immediate ACM to the terminating AT&T *4ESS* switch. This message (encoded for user network interaction) allows for a cut-through connection for the voice path in both directions.
19. The terminating *5ESS* switch OSPS-Listing Services forwards the call to the DA platform using CPDL (Position Seizure Message).
20. The terminating *5ESS* switch OSPS-Listing Services returns an ANM to the terminating AT&T *4ESS* switch when a DA position is seized.
21. The DA agent determines (from the caller) the desired DA service (such as basic listing service or enhanced searches), and queries the database.

22. When the desired listing(s)/search(es) are identified and, depending on the type of service/search request, a Release to Audio message is sent from the DA agent to the LSDB (via Release to Audio Key to transfer the call to an ARU). The call flow ends or proceeds, as determined by the following events:

    - For multiple listing(s)/search(es) where the caller hangs up before getting all the listings, the originating AT&T *4ESS* switch sends a Release message to the terminating *5ESS* switch OSPS-Listing Services. This message contains a Cause Indicator parameter with a Cause Value of 16 (normal clearing). When it receives this message, the terminating *5ESS* switch OSPS-Listing Services goes into a pseudo-hold state and waits for the billing information from the Listing Services database. The DA agent, recognizing that the calling party has gone on-hook, presses the Position Release key, which sends the billing information to the *5ESS* switch OSPS-Listing Services, which creates the DA AMA record for the call. The AMA record created at the *4ESS* switch is dropped by the Recorded Information Collection System (RICS) to avoid double billing. This ends the call flow.
    - If the caller remains on the call (no early disconnect), proceed to Step 23.

23. A Transfer Request CPDl message is sent from the Listing Services database to the terminating *5ESS* switch OSPS-Listing Services, requesting that the call be transferred to an ARU. This message includes all of the necessary data modules, and identifies the type of listing service requested and the listing information.

24. The terminating *5ESS* switch OSPS-Listing Services formulates a Call Progress Message (CPG), and sends it to the originating AT&T *4ESS* switch. The following key information is included in this message:

    - The DA GOP with Operation Class of Directory Assistance, and Type of Operation of DA Billing Information. This parameter contains the DA AMA billing information, such as search types, the count of each search type, an AMA module number (343), and an Information Identifier to identify the feature/service (Table 481).
    - The Cause Indicator parameter with a Cause Value set to 23.

25. The terminating *5ESS* switch OSPS-Listing Services sends an ARU Port Select message or a Call Completion ARU Port Select message to the Listing Services database.

26. The terminating *5ESS* switch OSPS-Listing Services begins the redirection procedure by checking the Redirect Capability parameter to determine if redirection is possible in the current call state. The DA Call Completion is offered to the caller (if the caller is eligible).

27. If the caller responds No to the offer, the ARU or the DA agent goes on-hook. The terminating *5ESS* switch OSPS-Listing Services uses CCS7 Release procedures that apply when the called party or the calling party hangs up first. The originating AT&T *4ESS* or Handoff switch generates a DA AMA record, based on the billing information received in the CPG. This ends the call flow (when the caller declines the Call Completion Offer).

28. If the caller responds Yes to the offer, the Listing Services Database notifies the *5ESS* switch OSPS-Listing Services via CPDL (Complete Call Message to the terminating *5ESS* switch OSPS-Listing Services), and the following events occur:

    - If redirection is possible, the terminating *5ESS* switch OSPS-Listing Services releases the call back to the originating AT&T *4ESS* switch. This is done via a **RELEASE message that contains the** following key information:
        - — The Redirection Number (listed number).
        - — The Cause Indicator parameter with a Cause Value of 23.
        - — The DA GOP with Type of Operation or Call Completion Billing Information, which identifies the type of DA service requested and the Means of Input.
        - — The Calling Party Number (caller's ANI), which is derived from the Charge Number parameter received in the IAM.
    - The *4ESS* switch maps the **RELEASE** message into a Q.931 **DISCONNECT** message (which includes the same information listed above for the **RELEASE** message), and sends it to the CLD Adjunct.
    - When the CLD Adjunct receives the Q.931 **DISCONNECT** message, it sends a Q.931 **SETUP** message (on the B3 leg) to the *4ESS* switch. The message includes the Called Party number field equal to the Redirection Number received in the **DISCONNECT** message, and the AMA module (990), including the 3-digit Service ID code taken from the GOP parameter. The Adjunct takes the Service ID code and inserts it into a Service Billing Data Information element of a Q.931 message.
    - When a **CONNECT** message is received on the B3 leg, the CLD Adjunct requests the *4ESS* switch to merge the B1 and the B3 legs.
    - The *4ESS* switch generates a call-completion AMA record.
    - A busy tone is provided on the B1 leg if the destination number is busy.
    - If Ring No Answer (RNA), a timer is provided on the B3 leg, and an announcement is played.

3. Provisioning

Recent Change Form 809

3.01 This feature is activated or deactivated by populating the FEATURE ITEM field on Recent Change (RC) Form 809 with PF44. ON populates office parameter ITEM OD4PF44 and means that Project Radar call processing is to be performed. OFF (the default setting) means that Project R call processing is not to be performed.

Recent Change Forms 300-304 and 346

3.02 The XL4CTH field in the Call Type is used by this feature to specify a Called Party Number feature ON/OFF condition. XL4CTH can be populated for the following Call Types: CRB, DSN, EAR, GNS, MCT, MMT, MRT, PRT, RDB, or RNR for all domains (which support the AD3 field) on 3-Digit Code Grouping forms RC 300-304 and RC 346. The item is populated by specifying an H in the AD3 field to indicate the Called Number ON condition.

Recent Change Form 652

3.03 The ATYP (Application Type) entry of DL is used on RC Form 652 for this feature. When an ATYP of DL is specified, HT4CPADATA is populated, and OD4_1DL is populated with the ALA (Adjunct Logical Address) value.

3.04 When an ATYP of PCP is specified and it was previously defined as DL, RC Form 652 checks if any 4-word Call Types are specified with the D or H indicator. If either is found the form is failed.

3.05 When an ATYP of PCP is specified and it was previously defined as DL, and no 4-word Call Types are specified with the D or the H indicator, then OD4_1DL will zero-out and HT4CPADATA will be populated.

4. Recording

4.01 As previously noted, all AMA recording for DA and Call Completion (1+calls) were moved from the *5ESS* switch OSPS-LS to the originating AT&T *4ESS* switch. This includes AMA (billing recording) for 1+900-555-XXXX, 1+555-XXXX, DA Search Transactions and Call Completion.

NOTE:
900-555-12XX calls currently use the routing number retrieved through High Capacity (HICAP) tables and, as such, are not eligible to offer Call Completion.

4.02 This feature introduces AMA Directory Assistance Module 343, which is shown in Table 13-A. Additional information is included in AMA Tables 88, 481 and 482 and is shown in Tables 13-B, 13-C, 13-E and 13-F.

Table 13-A. Directory Assistance Module 343

AMA Table Number	AMA Table Description	BCD Characters	Value
88	Module Code	4	'343' + Hexadecimal Sign 'C'
481	Information Identifier or Feature/Service Type	4	DA GOP parameter for DA Billing Information—Information Identifier digits 1 through 3 + Hexadecimal Sign 'C'
482	Data Item 1 or Search Type	4	DA GOP parameter for DA Billing Information —Search Type digits 1 through 3 + Hexadecimal Sign 'C'
482	Data Item 2 or Number of Searches	4	DA GOP parameter for DA Billing Information—Number of Search Type digits 1 through 3 + Hexadecimal Sign 'C'
482	Data Items 3 or Spare	4	'FFF' + Hexadecimal Sign 'F'.

Table 13-B. AMA Table 88—Module Codes

BCD Characters	Meaning
1-3	Module Code Number
4	SIGN (Hex'C')

Table 13-C. AMA Table 481—Information Identifier

BCD Characters	Meaning
1-3	Information Identifier 007 = Directory Information Service
4	SIGN (Hex 'C')

Table 13-D. AMA Table 482—Data Item #1

BCD Characters	Meaning
1-3	001-999 = Search Type
4	SIGN (Hex 'C')

Table 13-E. AMA Table 482—Data Item #2

BCD Characters	Meaning
1-3	001-999 = Number of Searches
4	SIGN (Hex 'C')

Table 13-F. AMA Table 482—Data Item #3

BCD Characters	Meaning
1-3	Spare - Hex 'FFF'
4	SIGN (Hex 'F')

4.03 A DA call is identified at the originating *4ESS* switch by appending 1 or more copies of AMA Module 343 to the AMA Structure created at the time of the 1+900 or 1+NPA call.

4.04 The only means of identifying an AMA Structure for a completed call from the originating *4ESS* switch as a result of a successful DA search is via the presence of AMA Module 990, which is unchanged and used per existing procedures.

Feature 6468

4.05 As previously noted, this feature is related to the Early Disconnect Handling for Project Radar Feature (6468), which is included in 4E23 Release 1 and described in a separate chapter in this document.

4.06 Feature 6468 prevents double billing of Project Radar Phase 2 calls that are recorded at the originating *4ESS* switch, and where the caller initiates an early disconnect before receiving the requested listing. Without Feature 6468, both the *4ESS* switch and the OSPS-Listing Services would generate a billable AMA record for the call.

4.07 Specifically, if a call that is identified as a DA Project Radar Phase 2 call and the DA GOP parameter for DA Billing Information is not received by the *4ESS* switch from the terminating OSPS-Listing Services, the *4ESS* switch populates the Service Feature Table (AMA Table 12) with 892 in the AMA record that is created for the initial DA call. Refer to Table 13-G for a description of AMA Table 12. Note also that 892 is a new value for the Service Feature Table (AMA Table 12).

Table 13-G. AMA Table 12—Service Feature Table

BCD Character(s)	Meaning
1-3	Information Identifier 892 = Project Radar Phase 2 Early Disconnect—Non- billable AMA
4	SIGN (Hex C)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Interactions With Other Features/Services

A. Software Defined Network Locations With Direct-Connect Trunks

NOTE:
Currently, 900-555-12XX calls use the routing number retrieved through High Capacity (HICAP) tables and, as such, are not eligible to offer Call Completion.

7.01 When 900-number calls from direct-connect locations are allowed by the originator, they are not handled as Software Defined Network (SDN) calls. The Private Branch Exchange (PBX) routes the call to the LEC End Office (EO), from where it is routed to the appropriate interexchange network via regular switched access (*4ESS* switch). The customer receives a separate bill for the call.

7.02 If the PBX misroutes the call to the *4ESS* switch, the switch blocks the call. Calls by SDN customers dialing 1+NPA-555-ABCD do not get DL treatment. The call is routed to the DA platform and does not receive a call completion offer based on the Call Completion Offer Indicator sent in ISUP.

B. SDN Locations With 10288 Switched Access To SDN

7.03 The 900-number call is routed by the LEC, as described above. At the *4ESS* switch the call is subjected to ANI table screening per existing procedures. If the customer's ANI is found in the ANI Trigger Table, a second screening for 800 and 900 numbers occurs. A call identified as an 800 or 900-number call is processed per existing procedures [no further ANI table screening or query of the Global Translation Table (GTT) occurs, per 10288 SDN requirements]. The call is not handled as SDN calls and the customer receives a separate bill for the call.

C. SDN Locations With 10732 Switched Access

7.04 Calls from SDN locations with 10732 switched access receive the same treatment as calls from SDN locations with direct-connect trunks, described above. SDN calls do not receive DL treatment. These calls are routed to the DA platform and do not receive a call completion offer based on the Call Completion Offer Indicator sent in ISUP.

D. Operator Express Direct Access

7.05 With Operator Express (OE), 1+calls (including DA calls) are sent to the

originating *5ESS* switch OSPS-Toll and Assist, and then to the *4ESS* switch for call handling and network routing. If allowed by the originator, 1+900 DA calls pass through the *5ESS* switch OSPS and are routed to a *4ESS* switch. Routing translations are done at the switch and include AMA recording. This OE direct-access scenario may also apply to 1+555-1288 DA calls.

E. PCP Customer Calls

NOTE:
900-555-12XX calls currently use the routing number retrieved through High Capacity (HICAP) tables and, as such, are not eligible to offer Call Completion.

7.06 900-number calls are routed by the LEC EO to a *4ESS* switch where ANI table screening occurs. When a customer's ANI is identified in the ANI Trigger Table, the switch performs screening for 800 and 900-number calls. If the call is identified as an 800 or a 900-number call, the call is processed per existing procedures; no PCP features are invoked. DL eligibility is determined at the PCP/2NCP database for 1+NPA-555-1212 calls.

F. 1+DIRECTory Link

7.07 This feature provides the capability to forward a Call Completion indicator for 1+DL calls to the terminating *5ESS* switch OSPS. Call completion from the *4ESS* switch (via the CLD Adjunct) is provided for the following accesses:

- 1+NPA-555-1212 (1+DL)
- 1+NPA-555-1288
- 1+555-1288 (1+ seven-digit access from an NPA)
- Local DA 411 or 555-1212 (Routed to the originating AT&T *4ESS* switch as 900-555-4411, for example).

G. AT&T Call Organizer

7.08 The ANI-based customers who subscribe to AT&T Call Organizer (ACO) and who dial 1+900-555-1288 are prompted by the CLD-Adjunct to enter their ACO PIN (before the calls are routed to the DA Vendor Agent Platform). With this feature (Phase 2), AMA recording for DA Call Completion (for 1+900-555-XXXX and 1+555-XXXX) is created at the AT&T *4ESS* switch. ACO subscribers are prompted to enter their ACO codes for DA calls.

H. Network Access Interrupt

7.09 Network Access Interruption (NAI) is a platform used to control bad debt and fraud losses. It is accessed from either the *4ESS* switch (1+ calls) and the *5ESS* switch (0+/)- calls).

7.10 NAI call processing is currently initiated from the *4ESS* switch on 1+ calls (such as 1+900-555-XXXX calls). When it is determined that the billing record is to be created at the *5ESS* switch OSPS for a 900 DA call, the terminating *5ESS* switch launches an NAI query before call completion. The call is denied if the query indicates that the call is a risk.

NOTE:
900-555-12XX calls currently use the routing number retrieved through High Capacity (HICAP) tables and, as such, are not eligible to offer Call Completion.

7.11 With Phase 2, applicable originating AT&T or handoff *4ESS* switch queries to NAI/USDS are maintained for all DA calls (for example, 1+900-555-XXXX, 1+NPA-555-1212 or 1+555-XXXX).

I. DA Via 1-800-CALL-ATT Prompt 4

7.12 This feature introduces access improvements/enhancements that indirectly impact the 1+800-CALL-ATT Prompt 4, such as the network routing plan and provisioning. This does not significantly change the customer experience for the Prompt 4 option, which offers DA service. AMA recording for DA and DA Call Completion calls is at the originating *5ESS* switch OSPS-Toll and Assist. There are no changes to the existing QuietHear controls that are applied to 1+800-CALL-ATT calls.

J. Number Portability

7.13 The switches at which the Call Completion offering takes place must be capable of correctly appending the Number Portability AMA module to the basic call AMA Record per existing Number Portability requirements. In addition, the Number Portability AMA module information must be properly transferred by the switches involved in the set up of the Call Completion portion of the call, per existing Number Portability requirements.

Interactions With Other Network Elements

A. *5ESS*® Switch OSPS

7.14 1+DA calls are forwarded from the originating AT&T *4ESS* switch to the terminating *5ESS* switch OSPS Listing Services. 0+DA calls incoming from the originating *5ESS* switch OSPS-Toll and Assist are received and forwarded by the *4ESS* switch.

B. CLD Adjunct

7.15 In Phase 1 of this feature, 1+DA calls that required CLD adjunct-based call processing were forwarded from the *4ESS* switch to the CLD Adjunct. In the NPA

Maintenance Table at the CLD Adjunct, these calls were provisioned so that DL is not offered, except for Canadian NPAs, CFW NPAs, and any NPAs that were not re-routed.

C. Universal Subscriber Data Structure

7.16 In Phase 1 of this feature, the determination that the call is DL-eligible and the subsequent routing to the CLD Adjunct occurred at the *4ESS* switch. In Phase 2, DL eligibility is determined at the USDS. Consumer Communication Services (CCS) ANI feature indicators migrate to the USDS platform, as described under Segmentation Directory, below.

D. Segmentation Directory

7.17 In Phase 2, ANI Trigger Table functionality migrates from the *4ESS* switch to the SD and Service Processors. USDS maintains the ANI Feature Indicator 1+DL Block for CSB ANIs. This indicator is passed to the switch in a TCAP response message that contains the switch capability parameter with bit B, 1+Directory Link Blocking, set appropriately.

7.18 For PCP ANIs, 1+DL Block continues to be maintained in the PCP/2NCP database, and the indicator is passed to the switch in a TCAP response message.

7.19 For non-PCP/USDS ANIs, the ANI Feature Indicator 1+DL Block is maintained in the SD, which sends an ANI Feature Indicator parameter with 1+DL Block set appropriately to the switch in a TCAP response message.

Ubiquity

7.20 It is necessary for all *4ESS* switches in the network to be running the 4E22 Release 4 or later Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

7.21 This feature is activated or deactivated as described in the Provisioning section of this chapter.

7.22 This feature can also be turned on or off by an absolute word change. Item OD4PF44 in the OD4OFCCOPY2 structure is the office parameter that controls the on/off state of this feature.

CAUTION:
The OD4OFCCOPY2 structure also contains the on/off bits for many other features. Be certain that any changes you make affect only this feature.

7.23 The following information can be used to turn this feature on or off using the absolute word change:

- Structure: OD4OFCCOPY2
- Core address in 4E22 Generic: 7145440+5
  Core address in 4E23 Generic: 7126214+5
- Size of OD4PF44: 1
- Displacement: 19 decimal or 23 octal
- On: 1
- Off: 0 (default).

8. Input/Output Manual Pages (Not Affected)

Message Header Reduction for the *4ESS*™ Switch Attached Processor Interface (API) Capacity Feature (5711)

14

Contents **Page**

Message Header Reduction for the *4ESS*™ Switch Attached Processor Interface (API) Capacity Feature (5711)

14

1. Feature Description

1.01 This feature increases the message throughput of the *4ESS*™ switch Attached Processor Interface (API) by reducing the effective "intra-switch" length of the messages sent through it. It makes no changes to the layout or content of the corresponding external formats.

1.02 This feature reduces the length of messages going from the Direct Link Node (DLN) to the API/1B, and in reverse for the following protocols:

- International Integrated Services Digital Network (ISDN) User Part (INUP) (international calling)
- Telephone User Part (TUP) (international calling)
- Transaction Capability Application Part (TCAP), AT&T Switched Network (ASN) Version
- Q.931, ISDN protocol used between Customer Premises Equipment and network equipment
- AT&T Trigger Platform (ATP) (an intraswitch interprocessor protocol).

Feature 5003, introduced in the 4E22 Release 1 Generic, uses the same technique for shortening all domestic ISDN User Part (ISUP) messages. Refer to Product Release Document 234-090-221AC.

2. Call Flow (Not Affected)

3. Provisioning

Recent Change Forms/Messages Affected

A. Recent Change Form 809

3.01 This feature is activated by populating the FEATURE ITEM field on Recent Change Form 809 with F14 and the ON OR OFF field set to ON.

NOTE:
Feature bit F14 is shared with the Attached Processor Interface Capacity Improvements feature (5003) in the 4E22 Release 1 Generic. Therefore, because feature 5003 and this feature share feature bit F14, either both will be turned ON or both will be turned OFF.

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 4E23 Release 1 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

7.02 This feature is activated or deactivated as described in the Provisioning section of this chapter.

7.03 This feature can also be turned on or off by an absolute word change. Item OD4F14 in the OD40FCCOPY+1 structure is the office parameter that controls the on/off state of this feature.

CAUTION:
The OD4OFCCOPY+1 structure contains on/off bits for many features. Be certain that any change you make will affect this feature only.

- Structure: OD4OFCCOPY+1
- Core address in the 4E23 Generic: 6650746
- Size of OD4F14: 1
- Displacement: 13 decimal or 15 octal
- On: 1
- Off: 0 (default).

8. Input/Output Manual Pages (Not Affected)

Circuit Selection Capabilities (CSCI) Recording Feature (5816)

15

Contents **Page**

Circuit Selection Capabilities (CSCI) Recording Feature (5816)

15

1. Feature Description

1.01 This feature allows the Intertoll Trunk/Load Forecast (ITLF) to automate the forecast of voice enhancement-free traffic and trunking. Prior to this feature, this forecast procedure relied on a manual process, which will now be eliminated.

Overview

1.02 With the deployment of Circuit Selection Capabilities Routing (CSCR) in the Real Time Network Routing (RTNR) intertoll network, Customer Specific Routing Option (CSRO) calls could be routed through a limited number of trunks that were provisioned without voice enhancement. Traffic measurements for CSRO calls were collected between *4ESS*™ switches in the RTNR network. However, this information applied only to the current capacity demands for the voice enhancement-free trunks between *4ESS* switch node pairs, and it was insufficient to support the rehome process in ITLF for CSRO customers. The collected traffic information did not include information for CSRO traffic from/to Local Exchange Carrier (LEC) end offices, access tandems and Nodal customers.

Feature Capabilities

1.03 This feature addresses the problem described above by requiring the *4ESS* switch to record the Circuit Selection Capabilities Indicator (CSCI) value on the Automatic Message Accounting (AMA) record that is associated with the end office information. The CSCI is assigned by the switch to each call.

NOTE:
The Circuit Selection Capabilities Routing features (4908, 5738 and 5533), provide the capability for calls to be routed on specific transmission circuits that have particular characteristics required by the calls. Calls can require, prefer or avoid selecting trunks, based on a set of transmission characteristics, such as with or without voice enhancement, fiber optic transmission or radio transmission. The circuit selection requirements for the call are indexed by the CSCI.

1.04 The CSCI value included in the AMA record is passed on a 5 percent sample of the billing records to the Centralized Message Data System II (CMDS-II) and ITLF for forecasting and planning purposes. This allows the manual process that ITLF used to adjust CSRO data for customer rehoming to be eliminated. The new automated process is also expected to improve the quality of the forecasting output.

1.05 In addition to the CSCI value, this feature also requires the *4ESS* switch to include the Service Identity Indicator (SII) value in the AMA records for future use.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording

4.01 The *4ESS* switch will append a new CSCR module, Module 949, to all call-originating AMA records, including records for originating access charge verification calls. The CSCR module is used to record the CSCI value assigned by the switch for each call, as well as the derived SII. Module 949 is shown in Table 15-A.

Table 15-A. Module Code 949—Circuit Selection Capabilities Routing Module

Information	Table Number	Number of Characters	Byte Offset
Module Code Identification	88	4	0
Circuit Selection Capability Indicator	927	4	2
Service Identity Indicator	901	4	4

4.02 The *4ESS* switch will also record the assigned CSCI value in BCD characters 2-3, in the data field Circuit Selection Capability Indicator (AMA Table 927) of the CSCR Module 949. See Table 15-B.

Table 15-B. AMA Table 927—Circuit Selection Capability Indicator

BCD Character	Description
1	0 (Constant)
2-3	Circuit Selection Capability Indicator
4	SIGN (Hex C)

4.03 The SII value is also included in existing AMA Table 901, as shown in Table 15-C. The SII value is used in Terminating Switch Access Arrangement (TSAA) structures 895-898.

Table 15-C. AMA Table 901—Service Identity Indicator

BCD Character	Description
1-3	Service Identity Indicator
4	SIGN (Hex C)

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 4E23 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)

Announcement Set D on the Integrated Services Announcement and Information Collection Feature (5844a)

16

Contents **Page**

Announcement Set D on the Integrated Services Announcement and Information Collection Feature (5844a)

16

1. Feature Description

1.01 This feature defines the measurements for Announcement Set D on the Improved Services Announcement and Information Collection (ISAIC) platform. The measurements appear on the following reports:

- Traffic and Plant Measurement
- On-Site Operations
- Traffic Data Administrative System.

2. Call Flow (Not Affected)

3. Provisioning

OD4OFCCOPY2

3.01 Office parameter **OD4PF43** indicates if the office is using new interpretations for the Node Capabilities and REQ_CAP parameters for SCS capabilities. The ON/OFF flag is populated using RC Form 809. Valid entries are defined in Table 16-A.

Table 16-A. OD4OFCCOPY2 Entries

Item/State	Word	Displace-ment	Size	Description
OD4PF43	5	18	1	REQ_CAP parameter for SCS capabilities
4ODFB_OFF (=0)				Feature OFF (default)
4ODFB_ON (=1)				Feature ON

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

Traffic Data Acquisition System Measurement Report

6.01 The SCSD_NO_PORT measurement counts the number of times the *4ESS*™ switch receives a 2 Direct Services Dialing (2DSD)/2 Network Control Point (2NCP) request to play an announcement from Set D, but no Set D ports are available.

6.02 This peg count is generated in the 1B Processor and is stored in the Traffic Data Acquisition System (TDAS) MC *dari* data file. The count is accumulated and initialized every hour.

Traffic and Plant Measurement Reports

6.03 Table 16-B defines the new Set D measurements. These counts are also generated in the 1B Processor. Two counts are total service circuit peg counts while the other two are total service circuit usage counts.

Table 16-B. New Traffic/Plant Measurements

Count	Definition
SETD_SZ	This counter is incremented by one when an idle Service Circuit System (SCS) Set D on ISAIC circuit is made service busy.
SETD_SU	After each 10-second scan, this counter is incremented by the number of SCS Set D on ISAIC circuits found service busy. The data is converted to Common Channel Signaling (CCS) units by the traffic program before output.
SETD_OV	After each 10-second scan period, this counter is incremented by the number of SCS Set D on ISAIC circuits not fulfilled.
SETD_MU	After each 10-second scan period, this counter is incremented by the number of SCS Set D on ISAIC circuits found maintenance busy. The data is converted to CCS units by the traffic program before output.

6.04 Each count is accumulated and initialized every 15 minutes, and stored in disk holding blocks. The measurements are reported in Measurement Subclass (MSC) 0, Output Measurement Set (OMS) 2, and MSC 23, OMS 0 and OMS 3. See Figure 16-1 and Figure 16-2 for the layout of these reports.

```
OMS 2   MF,  DTMF XMTRS,  NSCX AND MASFH CKTS
             SEIZURE    SVC  USAGE  OVERFLOW

MF                0      0                -
DTMF XMTR         0      0                -
NSCX              0      0                0
MSFHA             0      0                0
MSFHB             0      0                0
SCSB              0      0                0
SETD              0      0                0

          MTC USAGE
MF                0
DTMF XMTR         0
NSCX              0
MSFHA             0
MSFHB             -
SCSB              0
SETD              0
```

Figure 16-1. MSC 0, OMS 2 Layout

```
MSC 23  PERFORMANCE MEASUREMENTS - EQUIPMENT TYPE - PROCESSOR
OMS 0   MAINTENANCE OCCUPANCIES
  PROCESSOR   NETWORK  SERV CIRC
          0         0         0

OMS 3   PER CALL SERVICE CIRCUITS ACCUM MAINT OCC
    MF RCVR   DTMF RCVR  MF XMTR  DTMF XMTR
          0         0         0         0
     NSCXS       MSFHA       SCSB      SETD   CCIS XMTR
          0         0         0         0          0
```

Figure 16-2. MSC 23, OMS 2 and OMS 3 Layout

On-Site Operations Report

6.05 The On-Site Operations Report (OSOR) includes the new Traffic and Plant Measurements (described in Table 16-A). This report [Machine Load and Service Summary (MLSS), Page 4 of 5] is illustrated in Figure 16-3.

```
REPORT:MACHINE LOAD AND SERVICE SUMMARY      MLSS OFFICE:WNVL IL AA 40T
PERIOD:0930-1030                 PAGE 4 OF 5     DATE:  10/08/97

SERVICE CKTS + Q

LINE  ITEM        INS  CCSCAP    CCS    COUNT %OCC     HT   OVFL     %
----------------- ---- ------  ------  ------ -----  -----  -----  ----
440  ANN + TONES   840  30240       0      12   0.0   5.83      0   0.00
441  NCSX SVC      840  30240       0       0   0.0   0.00      0   0.00
442    MTC                          23
443  SCNB SVC      840  30240       0       0   0.0   0.00      0   0.00
444    MTC                          0
445  SETA SVC      840  30240       0       0   0.0   0.00      0   0.00
446    MTC                          0
447  SETC SVC      840  30240       0       0   0.0   0.00      0   0.00
448    MTC                          0
449  SETD SVC      840  30240       0       3   0.0   0.00      0   0.00
450    MTC                          0
451  SETE SVC      840  30240       0       0   0.0   0.00      0   0.00
452    MTC                          0
453  SETF SVC      840  30240       0       0   0.0   0.00      0   0.00
454    MTC                          0
455  SETG SVC      840  30240       0       0   0.0   0.00      0   0.00
456    MTC                          0
10/08/97   10:33:17
#597
```

Figure 16-3. OSOR MLSS, Page 4 of 5 Layout

Message Type 12

6.06 The following fields are being added to the Network Management Operations System (NEMOS) Message Type (MSGTYP) 12:

- Maintenance Busy Threshold for Set D DTMF-only Service Circuits
- Maintenance Busy Count for Set D DTMF-only Service Circuits
- Equipment Active Count for Set D DTMF-only Service Circuits
- Maintenance Busy Threshold for Set D ASR/DTMF Service Circuits
- Maintenance Busy Count for Set D ASR/DTMF Service Circuits
- Equipment Active Count for Set D ASR/DTMF Service Circuits.

6.07 Although being redefined as MSGTYP 14, MSGTYP 12 will be retained for one generic for backward compatibility.

7. Transition Considerations

Interaction with Other Features

7.01 This feature depends on the deployment of the following:

- Feature 5568—*9-Gigabyte Disk Units for Service Circuit System*
- Feature 5794—*4ESS™ Switch Service Circuit System Announcement Seconds Expansion*
- Feature 5835—*Announcement Administration Processor Disk Copy Enhancement*.

These features are included in the 4E22 Release 4 Generic. See *4ESS™ Switch Product Release Document, 4E22 Release 4 Generic*, 234-090-224AC.

Ubiquity

7.02 All *4ESS* switches in the network must be running the 4E23 Release 1 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

A. Recent Change Form 809

7.03 This feature is turned on at the same time as Feature 5794 (4E22 Release 4 Generic) and is activated or deactivated (the default) by recent change. RC Form 809 is used as follows to turn this feature on:

- Enter **PF43** in the FEATURE ITEM field
- Enter **ON** in the ON OR OFF field.

8. Input/Output Manual Pages (Not Affected)

Code Group Restructure Feature (5898)

17

Contents **Page**

Contents **Page**

Code Group Restructure Feature (5898)

17

1. Feature Description

1.01 This feature increases the number of:

- Call type indicators allowed in the AD3 field of Code Grouping forms
- Manual Subsequent Digit Types (SDTs) entered in the AD1 field of Code Grouping forms.

Call Type Indicator Increase

1.02 The Call Type INDicator (CTIND) field of the Call Type Word (CTW) is being grown by 4 bits. The CTIND field is populated using the AD3 field on Recent Change/Office Data Management System (RC/ODMS) Code Grouping forms and is used on a per-bit basis by call processing. The current field is 8 bits, which allows A to H to be entered. With the release of this feature, the field is grown to 12 bits, thus allowing A to L to be entered.

Exception:
The Service Switching Point (SSP) call type allows only an entry of A to H.

1.03 The CTIND is limited to 12 bits for the Inward Wide Area Telephone Service (INWATS) call type, while the SSP call type is limited to the current 8 bits.

Manual Subsequent Digit Type Increase

1.04 An SDT can be assigned a state of automatic (uses subsequent digits to route) or can be assigned one of 15 other manual states (uses something other than digits to route). Because these manual states are 1-word call types and have no room to grow, a new 4-word call type, Subsequent Digit Manual (**SDIGM**), is being created for manual SDTs. The SDIGM call type contains an SDT field that will accommodate 32 manual SDTs.

2. Call Flow (Not Affected)

3. Provisioning

Structures Affected

A. HT4DIGSUPP (Increase Call Type Indicators)

3.01 Because of the addition of I, J, K, and L to the call type indicator (XL4CTIND) overlay, the general 4-word call type layout is affected. The compool field 4XLCTIND is increased to 12 bits. The call types affected by this increase are listed in Table 17-A.

Table 17-A. Call Types Affected by the AD3 Increase

Call Type	Description
DSD	Direct Services Dialing Capability
RDB	Routing Data Block
TST	Maintenance Code Line
GNS	Go/No Go Screening
IRA	International Routing Actions
CRB	Customer Routing Block

Table 17-A. Call Types Affected by the AD3 Increase (Contd.)

Call Type	Description
PRT	Proportional Routing Treatment
RNHR	Robust Nonhierarchical Routing
DSN	Destination Switch Number
MRT	Multiple Routing Treatment
INW	INWATS
PAS	Mass Announcement System (MAS) Announcement
TEL	MAS Announcement with Televote Counting
TTS	Terminating Toll Switch
TTS_GNS	Terminating Toll Switch with Go/No-Go Screening
MMT	Meet-Me Teleconferencing
MCT	Multiple Carrier Treatment
EAR	Emergency Alternate Routing

3.02 The SSP call type does not grow the CTIND and is limited to the current A through H bits. The new compool name for the SSP CTIND overlay is XL4CTSSPIND and is 8 bits.

B. HT4DIGSUPP, HT4CODEGRP, HT43DIG, HT41DIG, and HT4PLUCT (Increase Manual SDTs)

3.03 The current CTSDTYPE field (for call types SD1, SD2, and SD3) is being replaced by the new 4-word call type **4XLSDIGM**, which is used for all manual SDXs. This call type contains a new SDT field (**CTSDTYPM**) and is grown from 16 states to 32 states. The compool assignment for the automatic SDT is being deleted. The field HXL4CTSDGRIDTYPE_M contains the size (number of words) of the grid table, with the following changes to the manual SDX (old CT):

- SD1 corresponds to the CT of SDIGM with XL4CTSDGRIDTYPE_MA assignment of 4XLCTSDGRIDTYPE_M16.
- SD2 corresponds to the CT of SDIGM with XL4CTSDGRIDTYPE_M assignment of 4XLCTSDGRIDTYPE_M28.
- SD3 corresponds to the CT of SDIGM with XL4CTSDGRIDTYPE_M assignment of 4XLCTSDGRIDTYPE_M1028.

3.04 Table 17-B lists the call types affected by the manual increase; Table 17-C lists the CTSDTYPM state assignments.

Table 17-B. Call Types Affected by the Manual SDT Increase

Call Type	Description
SD1	1 Subsequent Digit
SD2	2 Subsequent Digits
SD3	3 Subsequent Digits
SDIGM	Subsequent Digit(s): Manual Types

Table 17-C. CTSDTYPM State Assignments

AD1 Form Input	COMPOOL Symbol	Decimal Value	S-Digit Grid Index
—	—	0	Unassigned
RSI	4XLSDTRSI	1	Route Selection Index
MTS	4XLSDTMTS	2	MTS Class
DC	4XLSDTDC	3	Digit Count
DRTV	4XLSDTDRTC	4	Data Rate Capability
GSDN	4XLSDTGSDN	5	Global Software Defined Network (SDN)
TPC	4XLSDTTPC	6	Transport Capability
SDN	4XLSDTSDN	7	SDN Dialing Plan Options
IPR	4XLSDTIPR	8	Integrated Services Digital Network User Part (ISUP) Preferred Routing
V31K	4XLSDTV31K	9	Voice or 3.1kHZ Capability
CSRT	4XLSDTCSRT	10	Carrier Specific Routing
FPR	4XLSDTFPR	11	Facsimile Preferred Routing
LRN	4XLSDTLRN	12	Location Routing Number
LSIX	4XLSDTLSIX	13	Local Screening Index
LRGN	4XLSDTLRGN	14	Local Exchange Routing Guide Assigned Number
—	—	15 thru 31	Unassigned

RC Forms 300 to 304, 313 to 316, and 346

A. Increase Call Type Indicators

3.05 All Code Grouping forms that contain the AD3 field representing the Call Type Indicator are grown from 8 to 12 characters. The population rules are as follows:

- For the call types listed in Table 17-A, valid entries = **A, B, C, D, E, F, G, H, I, J, K** and **L** (four additional entries). These entries may be entered in any part of the field and in any order.
- For SSP, valid entries = **A, B, C, D, E, F, G and H**. These entries may also be entered in any part of the field.

B. Increase Manual SDTs

3.06 The user interface for Code Grouping forms is being modified to accept the entry of **SDX** for manual SDTs only in the CALLTYP and CALLDATA fields. No other entries (SD1, SD2, or SD3) are allowed.

Verify Forms/Messages Affected

3.07 All verify messages that contain the AD3 field are grown from 8 to 12 characters. Valid entries are **A** through **L**, and can be input only once. The following messages are affected:

- Input: 13f, 13g, and 13m
- Output: 3a through 3g, 3i through 3l, 3n, 3v, 3w 3z, 3ab, 3ak, and 3al.

3.08 The user interface for the CALLDATA and CALLTYP fields is being modified to accept an entry of SDX (manual) only. The SDX call type contains the data stating the size of the grid table entry. To obtain the size, enter the following message:

VER:CODEGRP:SDINDEX

3.09 All verify messages that input/output SDTYPE in the AD1 field or input/output CALLTYP of SD1, SD2, or SD3 now handle the new internal SDIGM call type. The following messages are affected:

- Input: 13a, 13b, 13f, 13g, 13m, and 13w.
- Output: 3a through 3g, 3i through 3l, 3m, 3n, 3v, 3w, 3y, 3z, 3ab,3ak, 3al, and 3an.

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 4E23 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 **VER:INTLCODE** output message is being modified to list all internal codes that point to a specific routing treatment.

4ESS™ Switch Nodal Egress Sequential Trunk Hunt Feature (5915)

18

Contents **Page**

Contents **Page**

4ESS™ Switch Nodal Egress Sequential Trunk Hunt Feature (5915)

18

1. Feature Description

1.01 This feature provides two new trunk hunt options for those Business Market Division (BMD) Customers with direct T1.5 connections, Integrated Services Digital Network (ISDN) or non-ISDN, from their Private Branch Exchange (PBX) to the AT&T Switched Network. Some customers have requested that AT&T provide trunk hunt options which operate on a static ordering of trunks, which is what this feature provides. These new options are as follows:

- From the Top Trunk Hunt
- Circular Trunk Hunt.

Like existing trunk hunt options, these new options operate on the Trunk Sub-Group (TSG) level. The new options do not replace any of the current trunk hunt options which will continue to be offered. This feature is a strategic initiative for AT&T's retention and winback of major nodal customers; it adds trunk hunt options to the AT&T service offerings that match those offered by their competitors.

Existing Trunk Hunt Options.

A. Trunk Grouping

1.02 The difference between the new trunk hunt options and the existing trunk hunt options is the way the *4ESS*™ switch manages the trunks within the TSG. When a TSG is provisioned, the *4ESS* switch internally groups the trunks into increments of 24

trunks each. These increments are referred to as Trunk Blocks and are the basic units used in the trunk hunt options. For example, a TSG consisting of 96 trunks would be grouped into four Trunk Blocks as shown in Figure 18-1. The Figure shows the members of the Trunk Block starting from 1, but the actual internal numbering of Trunk Block members begins at 0.

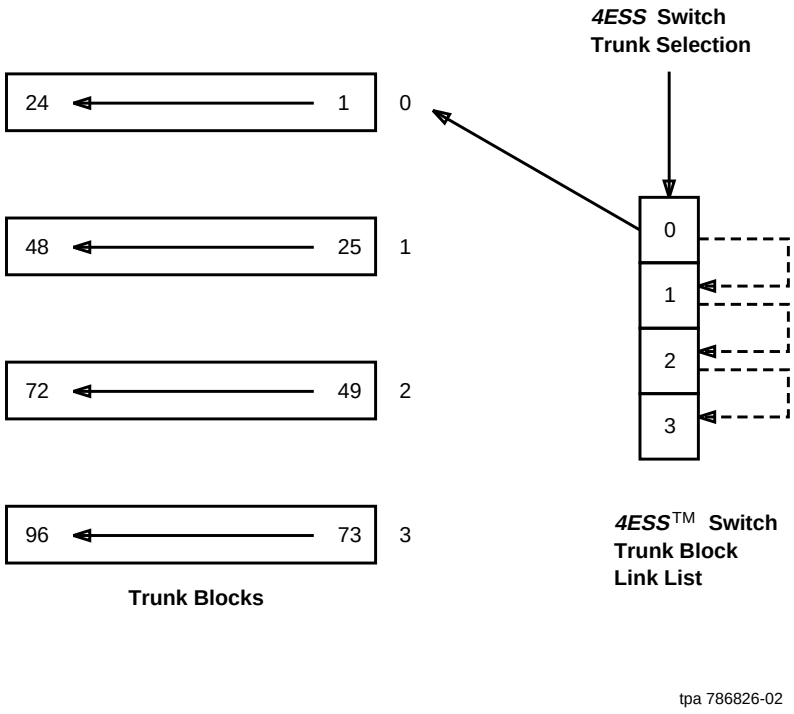

Figure 18-1. Internal Grouping of a Trunk Sub-Group Into Trunk blocks

1.03 With existing trunk hunts, the *4ESS* switch manages this linked list of Trunk Blocks to optimize the search. When a Trunk Block is entirely used, meaning there are no spare trunks in the Trunk Block, that Trunk Block is removed from its current position and re-linked to the bottom of the list as shown in Figure 18-2.

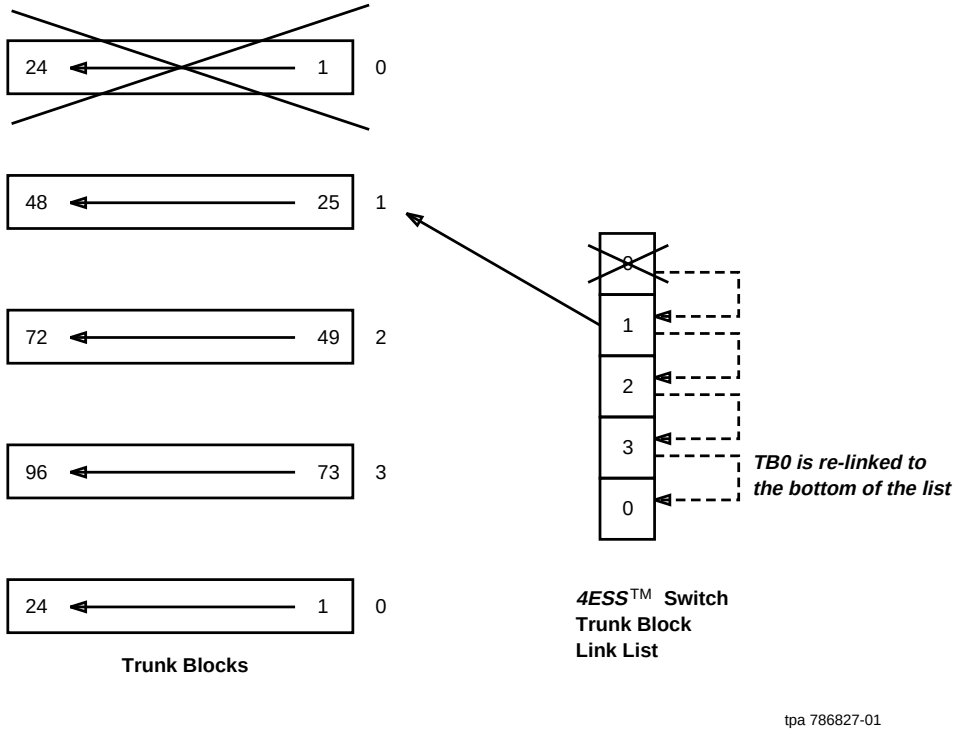

Figure 18-2. Re-linking a Fully Utilized Trunk Block to the Bottom of the List

1.04 Within the Trunk Block, the trunk hunt is sequential with or without memory. A Sequential Trunk Hunt, an existing trunk hunt, starts with the lowest numbered trunk in the first Trunk Block in the list and searches the Trunk Block sequentially until an available trunk is found. Trunk Hunt with Memory, another existing trunk hunt, remembers the last trunk chosen in the first Trunk Block and starts the hunt with the next sequential trunk. These existing trunk hunts are shown in Figure 18-3.

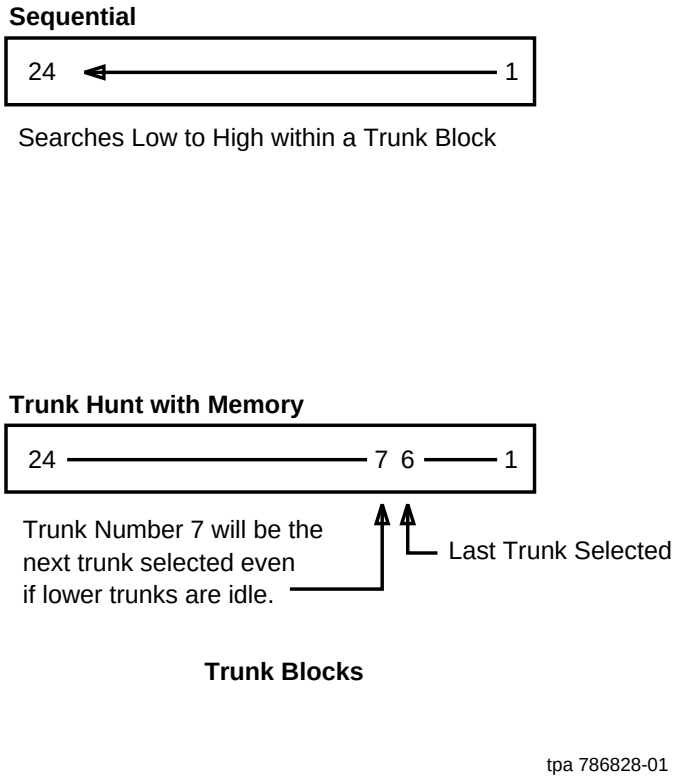

Figure 18-3. Sequential Trunk Hunt and Trunk Hunt With Memory

B. The Need For Static Ordering

1.05 Because of the Trunk Block link list management, as calls are received the search order of the trunks within the TSG is changed. This results in choosing trunks in a different order than if the order of the trunks within the TSG were held static. The primary difference, therefore, between the existing trunk hunt options and the new trunk hunt options is that the Trunk Block Linked Lists are dynamically re-arranged in existing options but remain static with the new options for this feature.

New Trunk Hunt Options

A. From the Top Trunk Hunt

1.06 This new trunk hunt is similar to the existing Sequential Trunk Hunt, except that the hunt always begins at the lowest numbered trunk in the TSG and searches low to high until the first idle trunk is found. See Figure 18-4. The linked list of Trunk Blocks is not dynamically changed, but remains in the same order. This trunk hunt option is active when the TSG MEM field is set to **NO**.

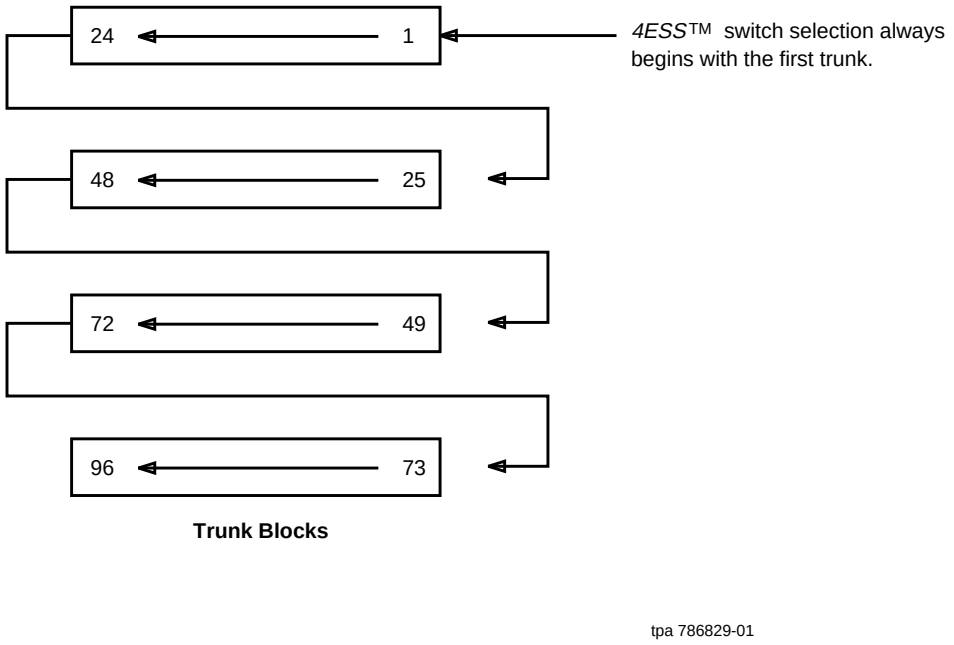

Figure 18-4. From The Top Trunk Hunt

B. Circular Trunk Hunt

1.07 The new Circular Trunk Hunt is similar to the existing Sequential Trunk Hunt With Memory, except that the hunt always searches through the entire TSG sequentially with memory before returning to the lowest numbered trunk. See Figure 18-5. This results in a hunt which circles through each of the trunks in the TSG before returning to the lowest numbered trunk. This trunk hunt option is active when the TSG MEM field is set to **YES**.

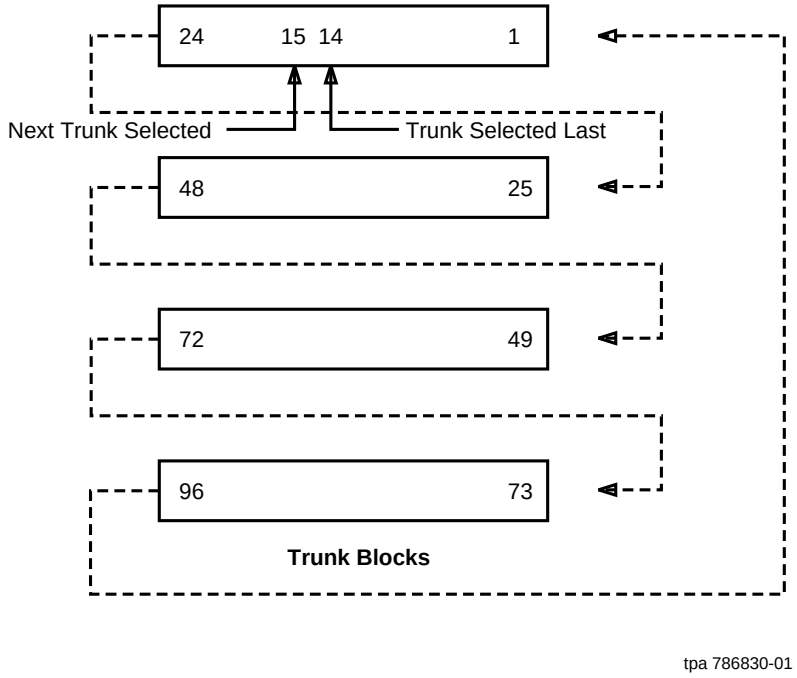

Figure 18-5. Circular Trunk Hunt

2. Call Flow (Not Affected)

3. Provisioning

Structures Affected

A. HT4TBNCORE Structure

3.01 For the 4E21 and 4E22 Generics only, one Trunk Sub-Group (TSG) field and item is used for this feature. Existing HT4TBNCORE item XL4TB_S5 is defined for TSG field S5. This item is word 5 in the Trunk Block. The meaning or use of field S5 is the same as the HUNT field for the 4E23 Release 1 Generic. In the 4E23 Release 1 Generic, field S5 becomes a spare field.

B. HT4TSG Structure

3.02 In the 4E23 Release 1 Generic and later, one new TSG item is copied to the call register. The new item, XL4TS_HUNT, has valid entries of blank or **CT**. This field is located on the 100-series Recent Change Forms and associated Verify Forms for 1-way incoming, 1-way outgoing, and 2-way TSGs.

Recent Change Forms Affected

3.03 For the 4E23 Release 1 Generic, Recent Change Forms 100, 101, 102, 107, 108, and 109 have added a new field identified as HUNT. The TSG functions for each of these forms are as follows:

- RC Form 100 - Adding a New Two Way Trunk Sub-Group
- RC Form 101 - Adding a New One Way Incoming Trunk Sub-Group
- RC Form 102 - Adding a New One Way Outgoing Trunk Sub-Group
- RC Form 107 - Changing a Two Way Trunk Sub-Group
- RC Form 108 - Changing a One Way Incoming Trunk Sub-Group
- RC Form 109 - Changing a One Way Outgoing Trunk Sub-Group.

3.04 The new HUNT field and the MEM field in each RC Form can have the following valid entries:

- HUNT Field is Blank = Traditional trunk hunt processing; the default is blank
- HUNT Field is **CT** = From the Top or Circular Trunk Hunt processing.
  - — From The Top Trunk Hunt = MEM set to **NO**
  - — Circular Trunk Hunt = MEM set to **YES.**

Verify forms Affected

3.05 For the 4E23 Release 1 Generic, Verify Forms 1a, 1b, and 1c have added a new field identified as HUNT. Valid entries for the HUNT field are as follows:

- **TD** = Traditional trunk hunt processing
- **CT** = From the Top or Circular Trunk Hunt processing.

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 to be running the 4E23 Release 1 Generic for this feature to be fully operational.

Turn On Mechanism

7.02 The new trunk hunts for this feature are turned-on on a Trunk Sub-Group (TSG) basis using the Recent Change (RC) Form that represents the TSG of interest.

The following sections, A through D, present procedures for selecting specific trunk hunts for incoming and outgoing TSGs.

A. Assigning From The Top Trunk Hunt to Existing TSG

7.03 To assign a From The Top Trunk Hunt to an existing TSG, new information must be entered on the RC Form representing the selected TSG.

From The Top Two Way TSG Assignment

7.04 For Assignment of a From the Top Trunk Hunt to a Two Way TSG, use RC Form 107, and do the following:

1. Enter **CT** in the HUNT field.
2. Enter **N** in the MEM field.

From The Top One Way Incoming TSG Assignment

7.05 For Assignment of a From the Top Trunk Hunt to a One Way Incoming TSG, use RC Form 108, and do the following:

1. Enter **CT** in the HUNT field.
2. Enter **N** in the MEM field.

From The Top One Way Outgoing TSG Assignment

7.06 For Assignment of a From the Top Trunk Hunt to a One Way outgoing TSG, use RC Form 109, and do the following:

1. Enter **CT** in the HUNT field.
2. Enter **N** in the MEM field.

B. Assigning Circular Trunk Hunt to Existing TSG

7.07 To assign a Circular Trunk Hunt to an existing TSG, new information must be entered on the RC Form representing the selected TSG.

Circular Two Way TSG Assignment

7.08 For Assignment of a Circular Trunk Hunt to a Two Way TSG, use RC Form 107, and do the following:

1. Enter **CT** in the HUNT field.
2. Enter **Y** in the MEM field.

Circular One Way Incoming TSG Assignment

7.09 For Assignment of a Circular Trunk Hunt to a One Way Incoming TSG, use RC Form 108, and do the following:

1. Enter **CT** in the HUNT field.
2. Enter **Y** in the MEM field.

Circular One Way Outgoing TSG Assignment

7.10 For Assignment of a Circular Trunk Hunt to a One Way Outgoing TSG, use RC Form 109, and do the following:

1. Enter **CT** in the HUNT field.
2. Enter **Y** in the MEM field.

C. Assigning From The Top Trunk Hunt to New TSG

7.11 To assign a From The Top Trunk Hunt to a new TSG, new information must be entered on the RC Form representing the selected TSG.

From the Top Two Way TSG Assignment

7.12 For Assignment of a From The Top Trunk Hunt to a Two Way TSG, use RC Form 100, and do the following:

1. Enter **CT** in the HUNT field.
2. Enter **N** in the MEM field.

From the Top One Way Incoming TSG Assignment

7.13 For Assignment of a From The Top Trunk Hunt to a One Way Incoming TSG, use RC Form 101, and do the following:

1. Enter **CT** in the HUNT field.
2. Enter **N** in the MEM field.

From the Top One Way Outgoing TSG Assignment

7.14 For Assignment of a From The Top Trunk Hunt to a One Way Outgoing TSG, use RC Form 102, and do the following:

1. Enter **CT** in the HUNT field.
2. Enter **N** in the MEM field.

D. Assigning Circular Trunk Hunt to New TSG

7.15 To assign a Circular Trunk Hunt to a new TSG, new information must be entered on the RC Form representing the selected TSG.

Circular Two Way TSG Assignment

7.16 For Assignment of a Circular Trunk Hunt to a Two Way TSG, use RC Form 100, and do the following:

1. Enter **CT** in the HUNT field.
2. Enter **Y** in the MEM field.

Circular One Way Incoming TSG Assignment

7.17 For Assignment of a Circular Trunk Hunt to a One Way Incoming TSG, use RC Form 101, and do the following:

1. Enter **CT** in the HUNT field.
2. Enter **Y** in the MEM field.

Circular One Way Outgoing TSG Assignment

7.18 For Assignment of a Circular Trunk Hunt to a One Way Outgoing TSG, use RC Form 102, and do the following:

1. Enter **CT** in the HUNT field.
2. Enter **Y** in the MEM field.

Turn Off Mechanism

7.19 The new trunk hunts for this feature are turned-off on a TSG basis using the RC Form that represents the TSG of interest. To return a TSG to the original trunk hunt type, use the 100 Series RC Form representing the trunk hunt of interest and do the following:

1. Return the HUNT field to blank. This assigns a traditional trunk hunt.
2. Return the MEM field to its original value. The MEM field value could have been changed when the HUNT field was changed to **CT**.

8. Input/Output Manual Pages

8.01 The **OP:TSGHC** output message is provided for this feature to output the address and the contents of the Trunk Sub-Group (TSG) Head Cell (TSGHC) and the address and contents of the adjunct TSG cell, if present.

Expansion of *4ESS*™ Switch OSPS Access ID Table Feature (5917)

19

Contents **Page**

Contents **Page**

Expansion of *4ESS*™ Switch OSPS Access ID Table Feature (5917)

19

1. Feature Description

1.01 This feature provides for the expansion of the Automatic Number Identification/Trunk Rating Number/True Billing Numbers (ANI/TRN/TBNs) that can be provisioned in the *4ESS*™ switch Operator Services Position System (OSPS) Access table and also provides for the expansion of the number of OSPS IDs that can be provisioned in the OSPS ID table.

2. Call Flow (Not Affected)

3. Provisioning

3.01 The following Data Administration requirements are defined to support the Expansion of OSPS tables in the *4ESS* switch:

- Increase the TBN to OSPS ID translator structures to accommodate an 8 bit OSPS ID
- Increase 3/6 Digit TBN entries to 6000
- Increase 10 Digit TBN entries to 1024.

Structures Affected

A. TBN to OSPSID Structures

3.02 These structures were created for the purpose of translating a TBN to an associated OSPSID. While a TBN is a 10-digit North American Numbering Plan (NANP) number, the translation to an OSPSID can be on a 3-digit (NPA), 6-digit NPA NXX), or 10-digit (NPA NXX XXXX) basis. The appropriate digits from the TBN are used to index these structures.

Three and Six Digit Structures

3.03 These 2-level structures, HT4TBHT0 and HT4TBHT1, each have headtables eight words in length and are used as part of the TBN to OSPSID translator. Only the first word of the headtable can point to a subtranslator where the 3- and 6-digit TBNs are located; the last seven words always contain the address of HT4ALLZERO and are provided for possible future growth. The subtranslator will consist of 6 consecutive 1024 subtranslator blocks totaling 6144 words of type 4XLSAUTA.

3.04 The two headtable/subtranslators provide two words of information for a TBN. A maximum of 6144 3- and 6-digit TBN entries are supported. The TBNs are sorted for a binary hunt and are stored as two single word components (in the same relative location). The first subtranslator entry contains one word of data consisting of digits 1-6 of the TBN. Each digit is stored in TELCO Binary Coded Decimal (BCD) and for 3-digit entries, digits 4, 5, and 6 contain "0" (in TELCO BCD). The second translator entry contains one word of data consisting of the OSPSID.

NOTE:
When using "VER:MISC:FHT OSPSTBNID!" command to print TBN to OSPSID table, the rule of printing sequence is by six digits TELCO BCD (in sequence 1, 2, ...9, 0).

Ten Digit Structures

3.05 These 2-level structures, HT4TTHT0 and HT4TTHT1, each have headtables eight words in length and are used as part of the TBN to OSPSID translator. Only the first word of the headtable can point to a subtranslator where the 10-digit TBNs are relocated; the last seven words always contain the address of HT4ALLZERO and are provided for possible future growth. The subtranslator, if it exists, is a 1024 word structure XL4OSPS_10DIG_0 and XL4OSPS_10DIG_1.

3.06 The two headtable/subtranslators provide two words of information for a TBN. A maximum of 1024 10-digit TBN entries are supported. The TBNs are sorted for a binary hunt and are stored as two single word components (in the same relative location). The first subtranslator entry contains one word of data consisting of digits 1-6 of the TBN. The second translator entry contains one word of data consisting of TBN digits 7-10 (in a mixed format: digit 7 in TELCO BCD and digits 8-10 in binary) and the OSPSID.

NOTE:
When using "VER:MISC FHT OSPSTBNID!" command to print TBN to OSPSID table, the rule of printing sequence is; first 7 digits by TELCO BCD (in sequence 1, 2, ...9, 0), the next 3 digits by decimal.

Growth and Retrofit

3.07 For only AT&T offices:

- The first entry of the HT4TBHT0 headtable must contain a subtranslator address and this subtranslator must contain 6144 consecutive words. All other entries in the headtable will contain the value of HT4ALLZERO. The first entry must always be populated by Office Data Management System (ODMS) with 6 consecutive 1024 subtranslator blocks totaling 6144 words.
- The first entry of the HT4TBHT1 headtable must contain a subtranslator address and this subtranslator must contain 6144 consecutive words. All other entries in the headtable will contain the value of HT4ALLZERO. The first entry must always be populated by ODMS with 6 consecutive 1024 subtranslator blocks totaling 6144 words.
- ODMS will populate the first entry of each of these headtables, HT4TBHT0 and HT4TBHT1, regardless of whether the first entries contain HT4ALLZERO or contain a valid subtranslator address in the previous generic or the contents of the translator is all zeros.
- The data stored in valid subtranslators located within the HT4TBHT0 and HT4TBHT1 headtables will be moved intact to the subtranslators in the new generic.
- When retrofitting to the new generic, all entries in the HT4TTHT0 and HT4TTHT1 headtables in the old generic that contain HT4ALLZERO will be replaced with HT4ALLZERO in the new generic.
- When retrofitting to the new generic, if the first entries in the HT4TTHT0 and HT4TTHT1 headtables in the old generic point to a subtranslator, store the fixed translator addresses in the first entry in the new generic. These are fixed compool structures grown from 64 to 1024 words:
  - — Fixed subtranslator for HT4TTHT0 is XL4OSPS_10DIG_0
  - — Fixed subtranslator for HT4TTHT1 0s XL4OSPS_10DIG_1.
- When retrofitting from an old generic to a new generic, the data contained within the subtranslator stored at the first entry in HT4TTHT0 will be moved intact to the fixed subtranslator in the new generic.

- When retrofitting from 4E22 to 4E23 Only, each populated (non-zero) word of data within the subtranslator stored at the first entry in HT4TTHT1 will be moved to the new fixed subtranslator in 4E23 using the following rules:
  - — Move bit position 23 from 4E22 entry to bit position 23 in the 4E23 entry.
  - — Move bit positions 22-19 from the 4E22 entry to bit positions 22-19 in the 4E23 entry.
  - — Bit position 18-7 contain 3 digits encoded in TELCO BCD in the 4E22 entry; these twelve bits must be converted to a binary value and stored in bits 18-9 in the 4E23 entry.
  - — Move bit positions 5-0 (bit 6 is unused) from the 4E22 entry to bit positions 7-0 in the 4E23 entry.
  - — After all of the ten digit entries have been processed as described in the four steps above, then the 10 digit entries must be resorted to achieve a binary sorted list, for the HT4TTHT0 and HT4TTHT1 structures.

  NOTE:
  These rules apply to each individual populated (non-zero) entry in the 4E22 subtranslator.

- For subsequent retrofits after 4E22 to 4E23, the data in the subtranslator located at the first entry of the HT4TTHT1 headtable will be moved intact to the subtranslator in the new generic.

Recent Change Forms Affected

A. Recent Change Message 6de

3.08 This message adds, changes, and deletes the TBN to OSPSID data.

Verify Forms/Messages Affected

A. Verify Message 16de

3.09 This message is to request verification of the TBN to OSPSID records.

B. Verify Message 6de

3.10 This message is to output the TBN to OSPSID records.

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Transition Planning

Ubiquity

7.01 It is not necessary for all *4ESS* switches in the network to be running the 4E23 Release 1 Generic for this feature to be fully operational. This feature is turned on automatically with software deployment.

8. Input/Output Manual Pages (Not Affected)

Originating Carrier Terminating Country Pair (OCTCP) and Carrier Identification Code (CIC) Table Enhancements Feature (6072)

20

Contents **Page**

Contents **Page**

Originating Carrier Terminating Country Pair (OCTCP) and Carrier Identification Code (CIC) Table Enhancements Feature (6072)

20

1. Feature Description

Originating Carrier Terminating Country Pair (OCTCP) Table Expansion

1.01 Prior to this feature, the OCTCP database had been limited to 256 entries in each *4ESS*™ switch. With this feature, the architecture now enables the operation system to provision 1024 entries in each *4ESS* switch and Gateway OCTCP Table, instead of the previous 256 entries. With the expansion of entries from 256 to 1024, the OCTCP now has sufficient capacity for the future as well as improved platform flexibility.

1.02 The International Switched Transit Service (ISTS) is an existing AT&T non-tariffed service that provides transport voice and voice-band data that originates from and terminates with a foreign Telecommunication Administration (TA) by way of AT&T. The ISTS Carrier Specific Routing (CSR) allows an originating foreign carrier to instruct AT&T, as transit carrier, to route ISTS calls to a terminating foreign carrier based on the preference specified by the originating carrier.

1.03 An Originating Carrier Terminating Country Pair (OCTCP) table, provisioned in all originating International Switching Centers (ISCs) and originating Gateways, is a switch-based database that stores the CSR related options and routing instructions. The OCTCP is recent changeable by way of a network provisioning system identified as the Common Network Routing Data Base (CNRDB). Each OCTCP entry defines how an ISTS-CSR call is routed by the AT&T Switched Network (ASN).

The OCTCP does this by providing the following:

- Carrier Specific Routing Treatment (CSRT): Chooses Mandatory, Preferred, or None
- Table Entry Index (TEI): Identifies a unique OCTCP Table entry (from 0 to 255 prior to this feature)
- Terminating Carrier and Overflow Carriers: Selects up to 7.

1.04 The ISTS-CSR platform is used by multiple projects (re-origination and ISTS), and OCTCP becomes a shared resource for these projects. However, it was anticipated that in the future, the capacity of the TEI would not be sufficient.

Carrier Identification Code (CIC) Table Enhancement

1.05 This feature expands the number of unique values supported by the *4ESS* switch for the TNS TYPE in the CIC Table from 8 unique values to 16 unique values. It does not define additional values for the TNS TYPE. As new features are developed that use the CIC Table in the *4ESS* switch, additional unique values can now be assigned to the CIC Table.

1.06 The Carrier Identification Code Table in the *4ESS* switch supports up to 10,000 CIC entries. See Figure 20-1. The CIC Table is used for both domestic and international incoming traffic to the Originating AT&T Switch (OAS) *4ESS* switch. For international calls, the Transit Network Selection Index (TNSI) is passed in signaling to the *4ESS* switch. For domestic calls, the TNSI is not signaled to the *4ESS* switch. As a result, the OAS *4ESS* switch uses a TNSI value of 0 for incoming domestic calls.

1.07 For each CIC entry in the table, there is an indexed array of 0-15 which the *4ESS* switch indexes with the TNSI to determine the Transit Network Selection (TNS) type for the call. In the past, the CIC table supported up to eight unique values for the TNS type. Three of these supported values were spares. These TNS types are Invalid (INV), International Outbound Transport (IOT), Global Software Defined Network (GSDN), RESELL (RSEL), and Featured RESELL. It was anticipated that, in the future, additional unique values would need to be supported by the CIC table and that the present number of values supported may not be enough. Also, the CIC Table was not targeted for transition to the Segmentation Directory (SD) Architecture, which would have solved this problem, until SD Phase 3. As a result, the previous limit of eight unique values for the TNS TYPE needed to be expanded.

CIC	TNSI	TNS-TYPE (3 Bit)
CIC1	0	Value1
	1	Value2
	.....	Value
	15	ValueM
CIC2	0	Value1
	1	Value2
	.....	Value
	15	ValueM
CICN	0	Value1
	1	Value2
	.....	Value
	15	ValueM

N = Up to 10,000 CICs
M = Up to 8 Unique Values

Logical View Prior to Feature 6072

CIC	TNSI	TNS-TYPE (4 Bit)
CIC1	0	Value1
	1	Value2
	.....	Value
	15	ValueM
CIC2	0	Value1
	1	Value2
	.....	Value
	15	ValueM
CICN	0	Value1
	1	Value2
	.....	Value
	15	ValueM

N = Up to 10,000 CICs
M = Up to 16 Unique Values

Logical View With Feature 6072

Legend:
CIC — Carrier Identification Code
TNS — Transit Network Selection
TNSI — Transit Network Selection Index

tpa 786826-01

Figure 20-1. Carrier Identification Code Table, Logical Views

2. Call Flow (Not Affected)

3. Provisioning

Structures Affected

A. OCTCP Table Expansion Structures

OD4MCT_OTCP Structure

3.01 This structure grows from 1K to 4K. The structure remains a one-level structure since a binary hunt is used to populate/retrieve OCTCP keys.

HT4OCTOCPOFAI Structure

3.02 This structure is always populated with an entry whenever an OCTCP key is populated in OD4MCT_OTCP. Currently these entries are a fixed size (16). Therefore, this structure quadruples from 4K to 16K.

B. CIC Table Enhancement Structures

HT4CCTTNS Structure

3.03 The size of this structure grows from 20K to 40K to support an expanded number of unique TNS-TYPE values. The TNS-TYPE items are being grown from 3 bits to 4 bits, causing each entry in the structure to grow from 2 words to 4 words.

Recent Change Forms Affected

A. OCTCP Table Expansion Recent Change Forms

Recent Change Form 662

3.04 The layout of this form changes by growing the TEI field from 3 characters to 4 characters to support up to 1023 entries.

B. CIC Table Enhancement Recent Change Forms

Recent Change Form 663

3.05 The layout of this form is not changing. Internally, the form supports the doubling of structure sizes and the growing of items.

Verify Forms Affected

A. OCTCP Table Expansion Verify Forms

Verify Form 6ba and 6bf

3.06 The layout of these forms has changed by the growing of the TEI field from 3 characters to 4 characters to support 1023 entries.

B. CIC Table Enhancement Verify Forms

Verify Form 6ai

3.07 The layout of this form has not changed but internally the form supports the doubling of structure sizes.

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 to be running the 4E23 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)

Additional Support Capabilities for 4E Local for Nodal Customers Phase 2 Feature (6142i)

21

Contents **Page**

Additional Support Capabilities for 4E Local for Nodal Customers Phase 2 Feature (6142i)

21

1. Feature Description

1.01 This feature provides additional support capabilities for the AT&T Digital Link feature (5371), introduced in the 4E22 Release 3 Generic, by updating the On-Site Operations Report (OSOR) format to include the Local Service Provider (LSP) output report of seizure counts as a separate item. The new measurement of the Machine Load Service Summary (MLSS) OSOR is planned for a future release.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

6.01 The source module EF20K maintains the MLSS database which provides counts every half hour in a rolling 24 hours for up to 430 measurements. Two separate databases create the 430 count. The MLSS database composes the first 239 counts, and the Load Distribution Reports (LDRs) and Load Service Reports (LSRs) database produces the remaining 191 counts. For this feature, one spare count is used at position 249 of 430, making it position 10 in the 191 count database.

6.02 The source module XS08 is the source that sets up the MLSS report. Table 21-A defines the measurements that are displayed for Integrated Services Digital Network (ISDN) User Part (ISUP)–LSP.

Table 21-A. ISUP–LSP Measurements

Measurement	Description
COUNT	Peg count for specified hour
%	Percentage of base that is represented by this count.
C/ET	Counters per equivalent ISUP trunks

7. Transition Considerations (Not Affected)

Ubiquity

7.01 It is not necessary for all *4ESS*™ switches in the network to be running the 4E23 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)

4ESS™ Switch CMS/ESS Audit Enhancement Feature (6156)

22

Contents **Page**

4ESS™ Switch CMS/ESS Audit Enhancement Feature (6156)

22

1. Feature Description

1.01 This feature provides an enhancement to the output data that is sent to the Testing, Operations, Provisioning and Administration System (TOPAS), or to CONNECT VU, in response to the AUD:TRKGRP message with the options of CAR, TSG and TSG/CAR. The message outputs the status of each trunk in the Trunk Sub-Group as a letter code. Prior to this feature the Maintenance Lockout (MTC.LKO) and the Circuit Administration Lockout (CAD.LKO) states received the same letter code, which was O.

1.02 With this feature, a different letter code will be used to identify each state, to allow them to be identified separately, as follows:

- The CAD.LKO trunks will receive the letter code C
- The MTC.LKO trunks will receive the letter code O.

All other states will retain the currently used codes.

1.03 This information about trunk status will be used to improve Out-Of-Service maintenance processes.

2. Call Flow (Not Affected)

3. Provisioning (Not Affected)

4. Recording (Not Affected)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting

6.01 This feature affects trunk maintenance, as described in the Feature Description.

7. Transition Considerations

Ubiquity

7.01 It is not necessary for all *4ESS*™ switches in the network to be running the 4E23 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)

NOTE:
The output message affected by this feature is a machine-to-machine message and is not documented in Input/Output Manual Pages. There were no changes to the Input message.

Multiple Carrier Treatment Expansion Feature (6363)

23

Contents **Page**

Multiple Carrier Treatment Expansion Feature (6363)

23

1. Feature Description

1.01 This AT&T proprietary feature identifies carriers and routing treatment in the multicarrier environment. The number of Multiple Carrier Treatment (MCT) tables has almost reached the maximum number because of growth in call types over the past few years. In order to support new services and features, the number of MCT tables has increased from 255 to 1023.

1.02 The following features benefit from the increase of MCT tables:

- Carrier Proportional Routing (CPR)
- Carrier Specific Routing (CSR)
- Carrier Specific Routing (CSR) for International Switched Transit Service (ISTS)
- Switch Digital International (SDI)
- Global Software Defined Network (GSDN)
- Facility Information (FAI) Expansion (5922).

2. Call Flow (Not Affected)

3. Provisioning

Recent Change Forms/Messages Affected

A. Recent Change Forms 339 and 340

3.01 These forms are used to add, change or delete multiple carrier treatment routing. The layout of these forms is not changing, but the MCTI form entry is revised to handle new values from 1 to 1023.

B. Recent Change Forms 300-304, 313-316 and 346

3.02 For the MCT calltype, the CALLDATA is revised to handle the new increased values for MCTIs 1 to 1023.

Verify Forms/Messages Affected

A. 13i, 3ac, and 3an

3.03 These forms and messages are changed to handle the new legal values for MCTI fields 1 to 1023.

B. 3a-3g, 3i-3l, 3n, 3v, 3w, 3z, 3ab, 3ak, 3al, 13f, 13g, 13m and 13w

3.04 These forms and messages are changed to input and output a new range of MCTI fields 1 to 1023 for the MCT calltype.

C. 6c

3.05 Form 6c, "**VER:MEMORY**", is changed to handle the new legal values 1 to 1023.

4. Recording (Not Affected)

5. Network Management

5.01 Network Management Operations System (NEMOS) supports the expansion of the MCT tables from 255 to 1023. Table 23-A defines the *4ESS*™ switch NEMOS messages that are expanded.

Table 23-A. Nemos Messages

Message Number	Data Type	Definition
5	5 Minute	MCT Traffic Data
42	Demand	Multiple Treatment Data
43	Demand	MCT Carrier Skip Control Status
49	Demand	Call Data
164	Control Request	MCT Carrier Skip Control Request

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 4E23 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 I/O manual pages are updated to reflect the new range of MCTI 1 to 1023 for the MCT calltype:

- Input message **VER:CODEGRP;OPT(MCT)**
- Input message **VER:RTGLIST**.

Project Radar Early Disconnect Feature (6468)

24

Contents **Page**

Project Radar Early Disconnect Feature (6468)

24

1. Feature Description

1.01 The Project Radar Early Disconnect feature prevents double billing when a caller uses Directory Assistance (DA) to request (domestic) information, but hangs up before receiving the information (early disconnect). When the customer hangs up, the recording *4ESS*™ switch does not receive the Signaling System 7 (SS7) Call Progress (CPG) message from the terminating *5ESS*® switch Operator Service Position System (OSPS)-Listing Services. The CPG message contains the Radar DA billing information.

1.02 While a billable Automatic Message Accounting (AMA) record is created at the terminating *5ESS* switch OSPS-Listing Services, one is also created at the originating *4ESS* switch, causing the customer to be double billed.

1.03 With the release of this feature, the AMA record is marked as unbillable when Radar DA data is not received.

2. Call Flow (Not Affected)

3. Provisioning

3.01 This feature is activated or deactivated by populating Recent Change (RC) Form 809. The population rules are as follows:

- FEATURE ITEM = **PF44**
- ON OR OFF = **ON** or **OFF**.

NOTE:
OFF (the default setting) means that Project R call processing will not be performed.

4. Recording

4.01 This feature prevents double billing of Project Radar Phase 2 calls recorded at the originating *4ESS* switch if the caller initiates an early disconnect before receiving the requested listing. Without this feature, both the *4ESS* switch and the OSPS-Listing Services generate a billable AMA record for the call.

4.02 If a call is identified as a DA Project Radar Phase 2 call and the DA Generic Operations Parameter (GOP) for DA Billing Information is not received by the *4ESS* switch from the terminating OSPS-Listing Services, the *4ESS* switch populates the Service Feature Table (AMA Table 12) with **892** in the AMA record created for the initial DA call. Table 24-A contains a description of AMA Table 12.

Table 24-A. AMA Table 12—Service Feature Table

BCD Character(s)	Description
1-3	Information Identifier 892 = Project Radar Phase 2 Early Disconnect—Non- billable AMA
4	SIGN (Hex C)

5. Network Management (Not Affected)

6. Maintenance/Troubleshooting (Not Affected)

7. Transition Considerations

Feature Dependencies

7.01 This feature depends on Feature 5532, *Project Radar Phase 2* (4E23 Release 1 Generic).

Ubiquity

7.02 It is necessary for all *4ESS* switches in the network to be running the 4E23 Release 1 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

7.03 This feature is turned on by setting the OD4PF44 bit using RC Form 809 (see **Provisioning**).

8. Input/Output Manual Pages (Not Affected)

Support for Go/No Go Screening (GNS) Call Type for ECOS Feature (6483)

25

Contents **Page**

Support for Go/No Go Screening (GNS) Call Type for ECOS Feature (6483)

25

1. Feature Description

1.01 This feature provides support for Go/No Go Screening (GNS) for Switched Digital International (SDI) transit calls, so that AT&T can selectively provide or deny service to different foreign Telecommunications Administrations (TAs). This enhances the capabilities of the End-To-End Class of Service (ECOS) Feature (3142) (4E20 Release 1), which did not allow a GNS Call Type for Non World Zone 1 (NWZ1) countries where ECOS was activated.

1.02 This feature allows ECOS routing from the GNS Call Type, which allows AT&T to provide selective switched digital transit service. Specifically, if number translation points to a GNS Call Type and the Far-End Area (FEAREA) parameter of the first Trunk Sub-Group (TSG) of the associated Routing Data Block (RDB) is populated and active, the *4ESS*™ switch will use ECOS routing logic to process the call.

1.03 Incoming SDI transit calls are received at an AT&T International Switching Center (ISC) on international trunks dedicated to switched digital traffic. SDI transit calls originate in one country and terminate in another, with part of the call path within the AT&T switched network.

1.04 SDI transit GNS provides the means of controlling incoming traffic from one or more foreign TAs. This allows AT&T to provide switched digital transit service selectively: providing service to TAs willing to pay the appropriate settlement fees and preventing non-cooperative TAs from using AT&T's transit facilities, either completely or partially.

NOTE:
This feature only supports the Dialed Number Service Type (DNST) of "Unassigned".

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 4E23 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)

Switch Solution for Software Defined Network (SDN) and 1 + Directory Link (DL) Feature Interaction Modification Request (MR) Feature (6617)

26

Contents **Page**

Switch Solution for Software Defined Network (SDN) and 1 + Directory Link (DL) Feature Interaction Modification Request (MR) Feature (6617)

26

1. Feature Description

1.01 This feature is a Modification Request (MR) for the Software Defined Network (SDN)-10288 Access to SDN Feature (3857), which was introduced in the 4E21 Release 4 Generic.

1.02 This feature assures that 10288 Access to SDN callers receive proper treatment and are not misrouted when they dial NPA-555-1212. Specifically, this feature forces a query to the SDN database each time 10288 SDN calls arrive at the *4ESS*™ switch, to make sure the calls are not sent to the 1 + Directory Link platform.

1.03 Prior to this feature, 10288 SDN calls arriving at the *4ESS* switch were incorrectly sent to the 1 + Directory Link (DL) platform, instead of initiating a query to the SDN database. This occurred because of the method used to activate the 1 + DL feature, and is corrected by this feature.

1.04 With this feature, the *4ESS* switch will ignore the AD3 value (AD3 = D) provisioned by Service NOW-Routing (SNOW-R) for DL service for incoming 10288 Access to SDN calls. Instead, the switch will process, route and generate billing records for the SDN call. 10288 Access to SDN calls will have precedence over 1 + DL calls.

2. Provisioning (Not Affected)

3. Recording (Not Affected)

4. Network Management (Not Affected)

5. Maintenance/Troubleshooting (Not Affected)

6. Transition Considerations

Ubiquity

6.01 It is not necessary for all *4ESS* switches in the network to be running the 4E23 Release 1 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

6.02 This feature is turned on automatically by software deployment.

7. Input/Output Manual Pages (Not Affected)

Ignore Calling Party Number on International Toll-Free Calls Feature (6638)

27

Contents **Page**

Ignore Calling Party Number on International Toll-Free Calls Feature (6638)

27

1. Feature Description

1.01 This feature is a Modification Request (MR) for the Inbound International 800 Separation of Country Code from Network Routing Number Feature (3957), which was introduced in the 4E18 Release 3 Generic, and the Inbound International 800 CSR and Enhanced Call Origination Feature (4785), which was introduced in the 4E21 Release 4 Generic.

1.02 This feature corrects the problems associated with completing Inbound International Toll-Free Subscriber (ITFS) calls. It assures that incoming international calls will not be killed because they include the Calling Party Number (CPN).

1.03 Some foreign carriers send the Calling Party Number (CPN) with the Initial Address Message (IAM) for international calls. Prior to this feature, the *4ESS*™ switch included this number and the Country Code (CC), which is provisioned on the trunk groups, in the query to the Direct Service Dialing (DSD) database. When the 2NCP received both the CPN and the CC, it would return an error message and instruct the switch to kill the call.

1.04 This feature corrects the problem by requiring the *4ESS* switch to ignore the CPN when it is received on international calls. Specifically, the switch will not use the CPN to populate the Automatic Number Identification (ANI) parameter of the Transaction Capabilities Application Part (TCAP) Begin message sent to the NCP. The ANI parameter will be empty as if there were no CPN. This applies to incoming ITFS calls originating from a country other than the NANP portion of the Caribbean or Mexico.

1.05 For incoming ITFS calls originating in the Caribbean or Mexico, and in the new Foreign Subscriber Identifying Telephone Number (FSIT) format, the switch will populate the ANI in the TCAP Begin message with the NPA-NXX-0000 obtained from the Trunk Sub-Group characteristics of the incoming trunk, and not with the received CPN.

2. Provisioning (Not Affected)

3. Recording (Not Affected)

4. Network Management (Not Affected)

5. Maintenance/Troubleshooting (Not Affected)

6. Transition Considerations

Ubiquity

6.01 It is not necessary for all *4ESS* switches in the network to be running the 4E23 Release 1 Generic for this feature to be fully operational.

Turn On/Turn Off Mechanism

6.02 This feature is turned on automatically by software deployment.

7. Input/Output Manual Pages (Not Affected)

MR to Payphone Compensation—Phase II Feature (6665)

28

Contents **Page**

MR to Payphone Compensation—Phase II Feature (6665)

28

1. Feature Description

1.01 This feature causes the *4ESS*™ switch to send a call to an Out of Band (OOB) announcement, rather than a "fast busy", when the payphone blocking announcement has to be played and the switch is not able to access Improved Service Announcement and Information Collection (ISAIC) sets S, B, or D. This OOB announcement indicates to the caller that the number dialed can not be reached from the caller's area. This prevents retries and indicates to the caller that blockage is due to the number being called, not the network.

1.02 In the 4E22 Release 4 Generic, the Payphone Compensation Phase II feature allows
the *4ESS* switch to block payphone originated 8YY calls, if requested by the 8YY subscriber. If the call is blocked, then the switch plays a new announcement to the caller via ISAIC announcement sets S, B, or D. If the switch can not access these sets, due to unavailable ports, the switch plays a "fast busy" to the caller. This "fast busy" can result in unsuccessful retries so a more informative announcement was needed.

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 4E23 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)

Release Summary—4E23 Release 1 Generic

29

Contents **Page**

Release Summary—4E23 Release 1 Generic

29

1. Growth and Retrofit Documents

1.01 The Growth and Retrofit Planning Group reports the following documentation impacts resulting from the 4E23 Release 1 Generic.

Please note that the 3B21D Processor is not release specific, and that it has its own quality gates. The documents listed here for the 3B21D Processor will not be available until near the end of the first quarter of 1998:

- 234-160-023: 4E22 to 4E23 Generic Retrofit and ODA Update
- 234-185-023: 4E22 to 4E23 1B Processor Retrofit and ODA Update Planning and Scheduling Guide
- 234-160-316: 4AP15 to 4AP16 Retrofit for the 3B Processor
- 234-353-400AC: Attached Processor System (APS) 3B20D to 3B21D Conversion
- 234-353-425: Attached Processor System 3B21D Growth/Degrowth
- 234-153-055: CNI Growth/Degrowth—DLN-AP30 Circuit Pack Update Feature (470)
- 234-153-055AC: CNI Growth/Degrowth—Interim D-Channel Expansion Feature (5361i).

2. Input/Output Messages

2.01 The following lists include the input and output messages for the 4E23 Release 1 Generic. All the messages are revised unless otherwise indicated:

- 4E23R1 Input Messages (IM-4B000-01)
  - AUD:GEN
  - AUD:LIBSYS
  - AUD:NWM
  - AUD:ODA
  - AUD:TPM
  - DGN:SFI (new)
  - EX:SFI (new)
  - LOAD:LIBSYS
  - OP:OOSUNITS
  - OP:SFISTAT (new)
  - OP:TSGHC
  - RMV:SFI (new)
  - RST:SFI (new)
  - SET:SOAK
  - TEST:SFI (new)
  - VER:INTLCODE.

- 4E23R1 Output Messages (OM-4B000-01)
  - AUD:0
  - AUDIT:AT-AUX-CLIEN
  - DGN/SFI-ILL (new)
  - DGN/SFI-NOT (new)
  - DGN/SFI-TERM (new)
  - DGN/SFI-TEST (new)
  - DGN/SFI (new)
  - EX/SFI-ADDR (new)
  - EX/SFI-ILL (new)
  - EX/SFI-LOOP (new)
  - EX/SFI-NOT (new)
  - EX/SFI-SUSP (new)
  - EX/SFI-TERM (new)
  - EX/SFI-TEST (new)
  - EX/SFI (new)
  - OP:SFISTAT (new)
  - OP:TSGHC
  - REPT:0
  - REPT:IAOFC
  - REPT:IATSG
  - REPT:SCS
  - RMV:SFI (new)
  - RST:IFB
  - RST:SFI (new)
  - TEST:SFI (new)
  - VER:CODEGRP-CCD
  - VER:EA-F-IIDIGIT
  - VER:EA-FUNC-OLI
  - VER:ECOS-AORL.

- Proprietary Input Messages
  - TEST:TCAPDSD
  - VER:EA-SC-IIDIG (new)
  - VER:EA-SC-OLI (new)
  - VER:MISC-FHTMAST (new)
  - VER:RTGLIST (new)
  - VER:VFUNC-PLUCHK (new).
- Proprietary Output Messages
  - REPT:IAOFC
  - REPT:IATSG
  - TEST:TCAPDSD
  - VER:CODEGRP-PLU (new)
  - VER:EA-IOSC (new)
  - VER:MISD-FHTOSID
  - VER:RTGLIST (new).

- 4AP16R1 Input Messages
  - ALW:DMQ
  - ALW:REX-RPCD
  - ALW:REX-RPCN
  - AUD:NMDATA
  - CMPR:ODA
  - COPY:APPTAPE
  - COPY:UPDATE
  - INH:DMQ
  - INH:REX-RPCD
  - INH:REX-RPCN
  - INIT:LN
  - LOAD:APPTAPE
  - LOAD:UPDATE
  - LOAD:UPDATE-CONT
  - LOAD:UPDATE-GEN
  - LOAD:UPDATE-NWM
  - LOAD:UPDATE-ODA
  - OP:APPFILE
  - OP:APPLOAD
  - OP:C7NET-B
  - SET:TRAP
  - VER:APPFILE
  - VER:APPTAPE
  - VER:GTT-CRCHK
  - VER:GTT-FEXPN
  - VER:SD-OLI (new)
  - VER:UPDATE.

- 4AP16R1 Output Messages
  - APP:APPENDIX-10
  - AUD:NMDATA-1
  - AUD:NMDATA-2
  - CMPR:ODA
  - COPY:UPDATE
  - INIT:LN
  - LOAD:UPDATE
  - LOAD:UPDATE-CONT
  - LOAD:UPDATE-GEN
  - LOAD:UPDATE-NWM
  - LOAD:UPDATE-ODA
  - OP:APPLOAD
  - OP:RING
  - OP:TRAP
  - REMACS:AUD
  - REPT:FAULT
  - REPT:IMSDRV-INIT
  - REPT:LN
  - REPT:RING-TRST-ER
  - REPT:RPCN
  - REPT:SPGTT
  - REPT:UPD-DCHN
  - VER:GTT-CRCHK
  - VER:GTT-FEXPN
  - VER:SD-OLI (new)
  - VER:UPDATE.

3. OS Interfaces

NOTE: The information in this item is based on the Project Plan and the Product Release Document for this release.

3.01 Several features in this release interface with various Operation Support Systems (OSSs). The following are interfaces with AMA, DARICS, IRAS, MACOSS, NEMOS, RICS, TDAS, and TOPAS. The items shown are based on the references in the Product Release Document (PRD) for the 4E 23 Release 1 Generic:

- 4880 AMA, DARICS, NEMOS
- 4908c IRAS,NEMOS
- 5060 DARICS
- 5129 AMA
- 5532 AMA, RICS
- 5816 AMA
- 5844a NEMOS, TDAS
- 6156 TOPAS
- 6363 NEMOS.

4. New or Changed Alarms

NOTE: The information in this item is based on the features documented in the Product Release Document for this release.

4.01 The **REPT:RING-TEST** output message is affected by Feature 505, *4ESS*™ Switch Header Validation. This message reports nine types of errors for the CNI ring.

5. Measurements/OSOR

The information in this item is based on the features documented in the current Product Release Document.

5.01 Feature 4880, Segmentation Directory Phase 2, introduces two new measurements, **PreSDQ_Blocked_FHT** and **PreSDQ_Blocked_Def**. In both cases, the SDQuery is blocked because of the Pre-SDQuery control. The former are given final handling treatment, while the latter are given default handling. In both cases, 5-minute counts are sent to NEMOS and hourly counts are sent to DEMS/DARICS.

5.02 Feature 4908c is a restricted feature. Separate documentation has been given to AT&T's *4ESS*™ Switch Technology Management Group for distribution to parties who need the information.

5.03 Feature 5844a, Announcement Set D on ISAIC, defines the following measurements that appear on the Traffic and Plant Measurement, On-site Operations, and TDAS Reports:

- The new Set D measurements for OSOR are the following:
  - **SETD_SZ**
  - **SETD_SU**
  - **SETD_OV**
  - **SETD_MU**.
- The following fields are being added to the NEMOS Message Type 12:
  - Maintenance Busy Threshold for Set D DTMF-only Service Circuits
  - Maintenance Busy Count for Set D DTMF-only Service Circuits
  - Equipment Active Count for Set D DTMF-only Service Circuits
  - Maintenance Busy Threshold for Set D ASR/DTMF Service Circuits
  - Maintenance Busy Count for Set D ASR/DTMF Service Circuits
  - Equipment Active Count for Set D ASR/DTMF Service Circuits.
- The **SCSD_NO_PORT** measurement now appears in the TDAS Measurement Report.

5.04 Feature 6142i, Additional Support Capability 4E Local for Nodal Customers Phase 2, updates the OSOR format to include the Local Service Provider output of seizure counts as a separate item. The following measurements are displayed for ISDN User Part–LSP:

- **COUNT** Peg count for specified hour
- **%** Percent of "BASE" that is represented by this count
- **C/ET** Counters per Equivalent ISUP Trunks.

6. Feature Activation Summary

6.01 The following is a summary of how the features documented in the Product Release Document for this release are activated:

(1) **Feature 478—*4ESS* Switch Attached Processor System RTR 21.17 Upgrade**

This feature is turned on automatically by software deployment.

(2) **Feature 496—Enhance TM Messages**

This feature is turned on automatically by software deployment.

(3) **Feature 505—*4ESS* Switch Header Validation**

This feature is turned on automatically by software deployment.

(4) **Feature 4880—Segmentation Directory Phase 2 Package 1**

If the Segmentation Directory Phase 1 Feature (4564) is turned on, this feature is turned on automatically by software deployment.

(5) **Feature 4904—Domestic ECOS Class of Service**

This feature is turned on automatically by software deployment. However, it does not affect egress routing until an AREA is defined and activated on the Trunk Sub-Group.

(6) **Feature 4908c—Circuit Selection Capabilities Routing**

This feature is turned on automatically by software deployment.

(7) **Feature 5060—Positive Lookup Table in Windowed Call Store**

This feature is turned on automatically by software deployment.

(8) **Feature 5123—Network Support for 8YY**

This feature is turned on automatically by software deployment.

(9) **Feature 5129—Inspection II Digits/Dialed Number**

This feature is turned on automatically by software deployment. All II/OLI-SC combinations default to "Allow" unless a Recent Change Form 348 input modifies it to "Deny."

(10) **Feature 5163—Positive Lookup Tools**

This feature is turned on automatically by software deployment.

(11) **Feature 5198a—CIC Based Resale**

This feature is turned on by software deployment and by recent change. See the chapter on Feature 5198a in the *4ESS* Switch Product Release Document (234-090-231AC).

(12) **Feature 5222—3B21D Attached Processor System Upgrade**

This feature consists of the installation of the 3B21D Processor.

(13) **Feature 5361—Internal D-Channel Expansion**

This feature is turned on by hardware and software deployment.

(14) **Feature 5532—Project Radar**

This feature is activated by an on/off bit with Recent Change Form 809. It can also be activated by an absolute word change.

REL	ON/OFF	ODA Word	Field Name	Address	Disp&Size
4E22	RC 809	OD4OFCCOPY2	OD4PF44	7145440+5	H=23 (octal),S=1
4E23R1	RC 809	OD4OFCCOPY2	OD4PF44	7126214+5	H=23 (octal),S=1

(15) **Feature 5711—Message Header Reduction *4ESS* Switch Attached Processor Interface**

This feature is activated by an on/off bit with Recent Change Form 809. Feature bit F14, which turns this feature on, is shared with Feature 5003, API Capacity Improvements, in the 4E22 Release 1 Generic. The two features are turned on and off together.

These features can also be activated by an absolute word change.

REL	ON/OFF	ODA Word	Field Name	Address	Disp&Size
4E23R1	RC 809	OD4OFCCOPY	OD4F14	6650746	H=15 (octal),S=1

(16) **Feature 5726—Per-Call Control–Network Evolution**

This is a restricted feature. The information about activation of this feature is contained in a Restricted PRD chapter which has been given to AT&T's Technology Management group for distribution to those who need it.

(17) **Feature 5816—CSCI Recording**

This feature is turned on automatically by software deployment.

(18) **Feature 5844a—Announcement Set D on ISAIC**

This feature shares an on/off bit with Feature 5794, *4ESS* Switch SCS Announcement Seconds Expansion. It is turned on automatically if that feature is on.

(19) **Feature 5898—Code Group Restructure**

This feature is turned on automatically by software deployment.

(20) **Feature 5915—Nodal Egress Sequential Trunk Hunt**

Trunk hunts are turned on by provisioning of the Trunk Sub-Groups.

(21) **Feature 5917—Expansion of OSPS Table in the *4ESS* Switch for CAT2**

This feature is turned on automatically by software deployment.

(22) **Feature 6072—OCTCP and CIC Table Expansion**

This feature is turned on automatically by software deployment.

(23) **Feature 6142i—Additional Support for *4ESS* Switch Local for Nodal**

This feature is turned on automatically by software deployment.

(24) **Feature 6156—*4ESS* Switch CMS/ESS Audit Enhancement**

This feature is turned on automatically by software deployment.

(25) **Feature 6363—Increase Number of MCT Tables**

This feature is turned on automatically by software deployment.

(26) **Feature 6468—Project Radar Early Disconnect**

This feature is turned on with Feature 5532. See the activation information for that feature.

(27) **Feature 6483—ECOS Support of GNS Call Type**

This feature is turned on automatically by software deployment.

(28) **Feature 6617—SDN and 1+DL Interaction MR**

This feature is turned on automatically by software deployment.

(29) **Feature 6638—Ignore Calling Party Number on ITFS Calls**

This feature is turned on automatically by software deployment.

(30) **Feature 6665—MR to Payphone Compensation Phase 2**

This feature is turned on automatically by software deployment.

Abbreviations and Acronyms

2CCP
No. 2 Customer Call Processing

2DSA
No. 2 Direct Services for ANIs

2DSD
2 Direct Services Dialing

2NCP
No. 2 Network Control Point

2STP
Number 2 Signal Transfer Point

A

ACM
Address Complete Message

ACCS
Automatic Calling Card Service

ACO
AT&T Call Organizer

ALA
Adjunct Logical Address

AMA
Automatic Message Accounting

ANI
Automatic Number Identification

ANITT
ANI Trigger Table

ANM
Answer Message

API
Attached Processor Interface

APN
Action Point Numbering

APS
Attached Processor System

ARU
Automatic Response Unit

ASN
AT&T Switched Network

ASTN
Alternate Signaling Transport Network

ATP
AT&T Trigger Platform

ATV
AT&T Trigger Validation

B

BCS-NCD
Business Communications Services-Network Call Denial

BLDS
Business Long Distance Service

BMD
Business Market Division

C

CAMA
Centralized Automatic Message Accounting

CC
Country Code

CCITT
Consultative Committee International Telegraph and Telephone

CCS
Common Channel Signaling

CFA4
Customer Features Available 4

CIC
Carrier Identification Code

CLD
Consumer Long Distance

CMDS-II
Centralized Message Data System II

CNI
Common Network Interface

CNRDB
Common Network Routing Data Base

COS
Class of Service

COS/RTNR
Class of Service/Real Time Network Routing

CPDL
Call Processing Data Link

CPPA
Calling Party Pays Airtime

CPR
Carrier Proportional Routing

CSC
Circuit Selection Capabilities

CSCI
Circuit Selection Capabilities Indicator

CSCR
Circuit Selection Capabilities Routing

CSR
Carrier Specific Routing

CSRO
Customer Specific Routing Option

CSRT
Carrier Specific Routing Treatment

CTIND
Call Type Indicator

D

DA
Directory Assistance

DARICS
Data Acquisition Reports and Integrated Communications System

DECOS
Domestic End to End Class of Service

DEMS
Dynamic Engineering Mechanized System

DFS
Directory Function Server

DL
Directory Link

DLN
Direct Link Node

DN
Dialed Number

DNST
Dialed Number Service Type

DRAR
Digital Radio Avoidance Routing

DSD
Direct Services Dialing

DTMF
Dual Tone Multi-Frequency

E

EAR
Error, Analysis, and Recovery

ECOS
End-To-End Class of Service

ERFISI
EasyReach Feature Interworking Service Indicator

ERPI
ECOS Routing Pattern Identity

F

FAI
Facility Information

FEAREA
Far-End Area

FITR
Forced Inter-Toll Routing

FVSR
Forced Via Switched Routing

G

GETS
Government Emergency Telecommunications Service

GNS
Go/No Go Screening

GOP
Generic Operation Parameter

GSDN
Global Software Defined Network

GTT
Global Translation Table

H

HAS
Handoff AT&T Switch

HDRN
High Density Ring Node

HTR
Hard To Reach

I

IAM
Initial Address Message

ICT
Incoming Trunk

IECOS
International End to End Class of Service

II
Information Indicator

IMS
Interprocess Message Switch

INV
Invalid

INWATS
Inward Wide Area Telephone Service

IOT
International Outbound Transport

iPCC
Individual Per-Call Control

IRAS
Integrated Routing Assignment System

IRN
Integrated Ring Node

IRN2
Integrated Ring Node2

IRN2B
IRN2 Modified to Support SRI2

IRN2B RPCN
RPCN using IRN2B

ISAIC
Improved Service Announcement and Information Collection

ISC
International Switching Center

ISDN
Integrated Services Digital Network

ISL
Intermediate Switch List

ISTS
International Switched Transit Service

ISUP
Integrated Services Digital Network User Part

ITN
Integrated Test Network

L

LDRs
Load Distribution Reports

LEC
Local Exchange Carrier

LS
Listing Service

LSP
Local Service Provider

LSRs
Load Service Reports

M

MCS
Main Call Store

MCT
Multiple Carrier Treatment

MF
Multi-Frequency

MLSS
Machine Load Service Summary

MR
Modification Request

MRT
Multiple Routing Table

MRTT
Multiple Routing Treatment Table

MSC
Measurement Subclass

MSGTYP
Message Type

MTP
Message Transfer Part

N

NAI
Network Access Interrupt

NAMACC
National Automatic Message Accounting Control Center

NANP
North American Numbering Plan

NCC
Network Control Center

NCD
Network Call Denial

NCP
Network Control Point

NEMOS
Network Management Operations System

NESAC
National Electronic Switching Assistance Center

NI
Network Interconnect

NID
Network Identification

NMDS
Network Management Display System

NPA
Numbering Plan Area

NSN
Network Switched Number

NWZ1
Non World Zone 1

O

OAS
Originating AT&T Switch

OCTAN
Octal Trunk Appearance Number

OCTCP
Originating Carrier Terminating Country Pair

ODA
Office Data Assembler

ODMS
Office Data Management System

OE
Operator Express

OLI
Origiinating Line Information

OMS
Output Measurement Set

OOB
Out of Band

OPC
Originating Point Code

OS
Operating System

OSOR
On Site Operations Report

OSPS
Operator Service Position System

P

PBX
Private Branch Exchange

PC/SSN
Point Code/Subsystem Number

PCC
Per Call Control

PCP
Positive Call Processing

PDD
Post Dial Delay

PECC
Product Engineering Control Center

PLU
Positive Look Up

PLUTO
Positive Look Up TOols

PMO
Present Mode of Operation

POTS
Plain Old Telephone Service

PRD
Product Release Document

Q

QHS
QuietHear System

R

RBOCS
Regional Bell Operating Companies

RC
Recent Change

RDB
Routing Data Block

REACH
Remote Adjunct Call Handling

RICS
Recorded Information Collection System

RNA
Ring No Answer

RPC
Ring Peripheral Controller

RPCN
Ring Peripheral Controller Node

RPI
Routing Pattern Identity

RSEL
Resell

RTNR
Real-Time Network Routing

RTR
Real Time Reliable

S

SA
Service Assist

SAFER
Split Access Flexible Egress Routing

SCP
Software Change Package

SCS
Service Circuit System

SCU
Service Circuit Unit

SD
Segmentation Directory

SDDN
Software Defined Data Network

SDI
Switched Digital International

SDI-CSR
Switched Digital International Carrier Specific Routing

SDIGM
Subsequent Digit Manual

SDN
Software Defined Network

SDS
Switched Digital Services

SDT
Subsequent Digit Type

SHARP
Shared Adjunct Resource Platform

SI
Service Identity

SII
Service Identity Indicator

SMO
SD Mode of Operation

SNOW
Service NOW

SNOW-R
Service Now-Routing

SP
Service Processor

SRI
Single Ring Interface VLSI Device

SRI2
SRI Chip Version 2

SS7
Signaling System 7

SSI
Small Scale Integration

SSP
Service Switching Point

STT
Success-To-The-Top

T

TA
Telecommunication Administration

TA
Toll and Assist

TAN
Trunk Appearance Number

TAS
Terminating AT&T Switch

TBN
True Billing Number

TC
Transport Capability

TCAP
Transition Capabilities Application Part

TDAS
Traffic Data Acquisition System

TEC
Transmission Enhancement Control

TEI
Table Entry Index

TG
Translation Guide

TGN
Trunk Group Number

TNR
Transmitted Noise Reduction

TNS
Transit Network Selection

TNSI
Transit Network Selection Index

TOPAS
Testing Operations Provisioning Administration System

TRN
Trunk Rating Number

TSG
Trunk Sub-Group

TSGHC
Trunk Sub-Group Head Cell

TUP
Telephone User Part

U

UGTT
Universal Global Title Translation

UIFN
Universal International Freephone Number

UP
User Part

USDS
Universal Subscriber Data Structure

USEC
Universal Services Echo Canceler

V

VAS
Via AT&T Switch

VBD
Voice Band Data

W

WCS
Windowed Call Store (WCS)

X

XPCC
XTSI Per Call Control

XTSI
Expanded Time Slot Interchange