



WESTERN ELECTRIC® Products

# NETWORK PLANNING LETTER

## Switching Systems

### **1A ESS™ SWITCH 1AE10/CCS7 GENERIC PROGRAM — NEW FEATURES AND ENRICHMENTS**

This letter contains planning information relative to the feature content for the 1A ESS switch 1AE10 generic program.

#### **REASON FOR REISSUE**

This NPL (Network Planning Letter) is reissued to update existing features and to add new features.

Note that the 1AE10 generic program features defined are currently planned to be released in several 1AE10 generic program PPU's (periodic partial updates). The specific PPU for each feature is indicated in the attachment.

The COEES (Central Office Equipment Engineering System) Information System has been updated to reflect the 1AE10 generic program features. The COEES hardware information was first available in June 1986. The complete COEES information for the 1AE10 generic program was available March 1987. The COEES information engineering document index for each feature is shown in the attachment.

There are two items related to the 1AE10 generic program that deserve special attention. The first is the conversion of existing trunks to CCS7 (Common Channel Signaling System 7) trunks. This conversion, required for each trunk, is accomplished in the 1A ESS switch via the RC:TKCNV7 recent change message.

The other item is the assignment of DPCs (destination point codes) and CICs (circuit identification codes). A DPC is the CCS7 address of a network node. A network node can be either a switching office, SSP (service switching point), or database. The DPC assignments have national significance and hence assignment of DPC values requires national coordination.

A CIC identifies a trunk and must have the same value at both ends of a trunk. Thus, assignment of CIC values requires coordination between telephone company switching systems.



The attachment contains a list of 1A ESS switch ISDN (Integrated Services Digital Network) User Part exceptions and 1A ESS switch SSP exceptions. Exceptions have been taken when:

- (a) The standard is not pertinent to domestic networks.
- (b) Substantial changes would be required to the existing switch to provide or utilize the standard.
- (c) The standard states requirements for features which the regional telephone holding companies have not specified in development requests.

The design has been implemented such that the exceptions will have no significant effect on the network.

This document is for planning purposes only and is not intended to modify or supplement specifications or warranties relating to AT&T products or services. For additional information or assistance, please contact your AT&T Account Executive.

**ATTACHMENT  
1A ESS™ SWITCH 1AE10/CCS7 GENERIC PROGRAM  
NEW FEATURES AND ENRICHMENTS**

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## 1. INTRODUCTION

Features discussed in this CIR are available with the 1AE10 generic program. Detailed Network Design requirements are included in the COEES (Central Office Equipment Engineering System) Information System. The COEES Information System has been updated and additional information will be published as it becomes available. For information on the 1AE10 generic program right-to-use fees, contact your local AT&T Account Executive.

The 1AE10 generic program features include base features, new optional features, and CCS7 versions of existing optional features. These features are briefly described in Parts 2, 3, and 4, respectively.

The special significance of the 1AE10 generic program is the implementation of SS7 (Signaling System 7) for the 1A ESS switch. The SS7 is the result of work initiated by the CCITT (International Telegraph and Telephone Consultative Committee). The CCITT is an international standards body that is working on an international standard for common channel signaling.

Another standards body, known as the T1 Committee of the Exchange Carriers Standards Association, specifies standards for North American signaling needs. The CCS7 (Common Channel Signaling System 7) protocol developed for the 1AE10 generic program is based on the American National Standard Signaling System 7, as defined by the T1 Committee and quoted in Bellcore (Bell Communications Research) TR-TSY-000317 Issue 1, August 1987. Table A provides issues (and their associated approval dates) being used as the base line for design for the CCS7 protocol requirements and the SSP (Service Switching Point)/800 Services features.

<b>TABLE A</b>		
<b>REQUIREMENTS DOCUMENT</b>	<b>ISSUE</b>	<b>DATE</b>
Message Transfer Part	T1X1.1, Issue 1	January 1985
Signaling Connection Control Part	T1X1.1, Issue 1	March 1985
Integrated Services Digital Network User Part	Bellcore - TR-TSY-000317	August 1987
Transaction Capabilities Application Part	T1X1.1, Issue 1	August 1985
Service Switching Point/800 Services	Bellcore - TR-TSY-000024	October 1985

Application of the CCITT/T1 SS7 to the 1A ESS switch will be known as CCS7. The CCS7 provides for the exchange of information between nodes (for example, processor equipped switching systems), which are identified as point codes, over a network of signaling data links. All signaling data, including the supervisory and address signals necessary to control ordinary call set-up and take-down and special service related signals, are exchanged by these systems over the signaling links. The CCS7 protocol is based on the seven-layer OSI (open system interconnection) model.

Among the significant advantages of CCS7 are:

- A multitude of new and improved services (possibly due to the flexibility and size of the CCS7 messages).
- New and improved services (will generate additional revenues).
- The improved efficiency and speed of interoffice call setup (allows lower facility and register costs for providing equivalent levels of service).
- Improved fraud prevention (since call setup signals are not sent over the facility used for the conversation).

The 1AE10 generic program features have been released in several 1AE10 generic program PPU's (periodic partial updates). The PPU for each feature is listed in Table B.

The COEES Information System is being updated to reflect the 1AE10 generic program. The COEES Information System Engineering Document Index for each feature is listed in Table C.

Part 9 defines documents for the 1AE10/CCS7 generic program.

Part 12 provides the 1A ESS switch ISDNUP exceptions to Bellcore TR-TSY-000317.

Part 13 provides the 1A ESS switch SSP exceptions to Bellcore TR-TSY-000024.

## **2. NEW OPTIONAL FEATURES**

These features are available beginning with the 1AE10 generic program retrofit (1AE[C9B10]10.00), (1AE[C9B10]10.01), or (1AE[C9B10]10.02).

The MIP, ISUP, SSP, 800 Service, TCAP, and the OFNS features are **only** applicable to 1A ESS Attached Processor System-equipped switches.

### **2.1 1AE10.01 Generic Update**

#### **2.1.1 Message Interface Processor**

In order to provide the functions and services of CCS7, a standard interface is required to connect a 1A ESS switch to the CCS7 network. This interface will provide Levels 1, 2, 3 and part of Level 4 functions of the CCS7 protocol. The MIP (Message Interface Processor) is the interface or vehicle for various applications to access the CCS7 signaling network. The term "application" in this context refers to any feature or service on the 1A ESS switch that utilizes the basic transport

capability provided by MIP.

This transport function is a fundamental capability for the CCS7 project. MIP will provide an internal function that will be independent of the network protocol. It will support a variety of services and functions. MIP will provide an interswitch transport function to transport packets of control information.

Within this transport capability, the following functions are performed:

- (a) Access to the CCS7 network.
- (b) Administrative functions that include database administration and measurements.
- (c) A message distribution function to deliver incoming messages to the proper destination (application).
- (d) CCS7 communication protocol functions.
- (e) Maintenance routines that are used to restore, remove, diagnose, and initialize the transport path.
- (f) Flow control information to indicate that a particular destination cannot be reached (for example, due to congestion) or a particular user part (that is, ISUP) is out of service.

Set card 9SMIP defines the feature group for the MIP feature.

### 2.1.2 Integrated Services User Part

**Note:** Although, in the 1A ESS switch, the term ISUP is used, its functionality is equivalent to ISDNUP as defined in the Bellcore TR-TSY-000317.

The ISUP (Integrated Services User Part) feature performs the signaling functions necessary for intra-LATA call setup, call tear-down, and trunk maintenance. The interactions between the ISUP feature and the telephone switch are similar to those of other signaling systems [for example, PTS (per trunk signaling)], but these interactions will be handled differently by ISUP than by other signaling systems. Set card 9SISUP defines the feature group for the ISUP feature.

Some advantages of ISUP include improved speed and efficiency of interoffice call setup and improved fraud prevention.

ISUP is based on the protocol specified in Bellcore TR-TSY-000317, August 1987.

### 2.1.3 Service Switching Point

The SSP (Service Switching Point) feature provides the TELCO switches with the structure to provide Number Services calls to the TELCO customers (refer to Bellcore TR-TSY-000024). Number Services calls are a collection of services that are triggered by the dialed number, provide inward call-management capabilities, and usually require access to a network database to complete the call. The 800 Number Services feature is the first application of SSP Number Services. The SSP feature can be resident at an EAEO (equal access end office), an AT (access tandem) office, or an EA tandem office (non-AT).

The SSP feature provides front-end processing for Number Services calls (for example, 800 Number Services calls) and will provide the telephone operating company switches with the base capabilities required for most identified Number Services call types. These capabilities include the ability to:

- (a) Recognize the special dialed numbers that indicate a request for a Number Services call.
- (b) Hand the call off (via routing translations) to an SSP switch if the SSP feature is not active in the originating office.
- (c) Generate a database query at the SSP (using the Transaction Capabilities of CCS7).
- (d) Use the information returned from the database to route the call.

A significant SSP capability is that of routing Number Services calls to specific ICs (inter-LATA carriers) or within the TELCO. Such routing will depend upon the arrangements made between the Number Services customer, the TELCO and the carriers. These arrangements may include different routing based upon time-of-day, day-of-week, and location at which the call originated.

The SSP feature requires either the AMASE (Automatic Message Accounting Standard Entries) or the OFNS (Old Format AMA Number Services) capability. Set card 9SSSP defines the feature group for the SSP feature.

#### **2.1.4 800 Services**

The 800 Services feature provides Equal Access for INWATS service in the divested environment (refer to Bellcore TR-TSY-000024). Either an AT office can serve as an SSP to which 800 calls are routed for processing, or the EAEO can perform the SSP function. The SSP office uses CCS7 to query a TELCO-owned database, which returns the routing number and the carrier to route the call. The routing number could be a DDD (direct distance dialing) number, an International DDD number, or an 800 number. Also, the returned information could indicate that the TELCO is the carrier and the DDD number will route intra-LATA. This routing information can be dependent on time-of-day, day-of-week, geographic location, or other arrangements made between the INWATS customer and the TELCO from which the call originated.

When an originating customer dials an 800 number, the SSP feature identifies the call as a Number Services 800 call and hands it off to the 800 Services feature. The 800 Services feature requests a database query be made and passes information needed in the query to the TCAP feature. The TCAP feature formats and sends a CCS7 message which queries the database for routing information. The TCAP feature receives a response message and returns to 800 Services a carrier number and DN for the call. The 800 Services subsequently routes the call to that number via the chosen carrier. Set card 9SSSP8 defines the feature group for the 800 Services feature.

### **2.1.5 Transaction Capability Application Part**

The TCAP (Transaction Capability Application Part) feature provides the protocol for messages that will allow control of noncircuit-related information exchanged between two or more signaling nodes via the CCS7 signaling network. Note that TCAP is **not an application feature**. It provides common services to all Number Services features. The TCAP feature is flexible enough to provide service (utilizing CCS7 TCAP protocol) to any application that requires information transfer between exchanges, service control points, and databases.

The first use of TCAP for a Number Services feature is for the 800 Services feature. Once 800 Services has control of a call, it must query an external database for routing instructions. The 800 Services feature depends directly on the TCAP feature for formation and initiation of outgoing messages and for correlation and distribution of incoming messages related to the query. The LASS feature also requires TCAP. Set card 9STCAP defines the feature group for the TCAP feature.

The MIP feature is required by TCAP (see section 3.1).

### **2.1.6 Recent Change Macro Enhancement**

This enhancement modifies the macro used in recent change data check tables to allow for logical expressions.

### **2.1.7 Call Gap Enhancement**

This feature provides the capability to activate network management controls that do **not** activate the OLC (outgoing load control) lamp in the 1A ESS switch. The control is requested via a new call gapping message.

With this control, an office can activate call gap controls on a semipermanent basis and not have these controls affect the OLC lamp. Thus, the OLC lamp will only indicate the presence of the temporary call gap controls.

### **2.1.8 Step by Step Circuit Conversion for CCIS6 and CCS7 Signaling**

Circuit SD-1A220 is used as an incoming trunk circuit from SXS (Step by Step) switches. After removal of the SXS switch, this circuit can be reassigned through translations (without hardware modification) as an incoming CCIS6 or CCS7 trunk.

### **2.1.9 Old Format AMA for Number Services**

The OFNS (Old Format Number Services) feature provides the option of old format AMA records for SSP/800 Services calls. When OFNS is activated, the AMA records are processed and formatted in the 1A ESS switch and then the AMA records are written onto an AMA tape. A copy of the AMA records for SSP/800 Services calls is sent to the APS (Attached Processor System) so that the appropriate termination notification message can be sent by the APS to the SCP (Signal Control Point). Set card 9SOFNS defines the feature group for the OFNS feature.

### **2.1.10 Single Line Remote Call Forwarding Without SFG(s)**

The SLRCF (Single Line Remote Call Forwarding) feature permits RCF (Remote Call Forwarding) from residential (non-centrex) base DN(s) to remote DN(s) without the requirement of SFG(s) to the RCF base DN(s). SFG(s) are removed on a customer by customer basis via recent change. If the SFG is removed from an individual base DN in a 1A ESS switch with SLRCF, all *interoffice/interswitch* calls to a remote DN (automatically) link a TPT (temporary transfer) register instead of an SFG register. (The TPT register is also known as the Call Forwarding Register.) SLRCF is activated by set card FF043.

### **2.1.11 Interoffice Multiple Call Forwarding**

The IMCF (Interoffice Multiple Call Forwarding) feature decreases the holding time of the TPT registers used with interoffice SLRCF calls. In addition, IMCF decreases the holding time for TPT registers assigned to all interoffice CFV and CFUP (Call Forwarding Usage Sensitive) calls. The IMCF capability allows multiple interoffice calls from a single base DN if the remote DN is assigned a feature such as multiline hunt group or series completion which allows for the handling of more than one call at a time. IMCF is assigned on a per switch basis and IMCF is activated by set card FF044.

### **2.1.12 DCT Continuity and Polarity Test Enhancement**

This enhancement provides line side tip and ring continuity and polarity tests. These changes to the diagnostic program for "Common System 48 Channel PCM Bank Type DCT CCU (Combined Channel Unit)" SD-3C329-01 improve the maintainability of these circuits. The changes help to resolve tip/ring reversals when the DCT CCU(s) are installed. The test circuit being used, SD-1A226-01 continuity and polarity test circuit, is an existing circuit and is a required test circuit in every switch.

### **2.1.13 AMASE - Verification Enhancement**

The AMASE/VFY enhancement provides (standard option) support for the new billing records added in the 1AE8A.04 generic program and later. This software allows a central office to concurrently create and record *old format* billing records (except for statistical records such as INWATS overflow counts, ESSX-1 counts, and carrier interconnect overflow counts etc.) on a 1A ESS switch tape and send *standard format* billing records to all Host Collectors. This option provides the operating company with the ability to match and compare billing records made by both systems. The AMASE/VFY option is turned on or off by the craft personnel.

AMASE/VFY also guarantees that during major and minor overload conditions or when the AMASE buffer becomes full on the 1A ESS switch, the AMASE/VFY option will produce only *old format* billing records.

Note that with the METS (Multientry Teleprocessing System) the benefits of AMASE Verification are lost since under that system AMA records are not assembled in the 1A ESS switch; and thus no completed AMA records are available to be written to tape.

#### **2.1.14 ETSBES Authorization Code Recording for the EEDP Enhancement**

Presently, a customer with the EEDP feature can dial and record class I calls with an authorization code, but cannot record class II calls with an authorization code. Class II EEDP calls are calls that terminate after dialing 7 or 10 digits. Class II EEDP calls are:

0	Operator Assistance
0+7/10 digits	Operator Assisted Calls
011 + digits	International Direct Distance Dialing (IDDD)
010	IDDD Operator
01+7/10 digits	TSPS Special Services
NXX	3-Digit Dialing Complete (Service Codes).

The ETSACRE enhancement allows authorization code dialing and recording with class II calls. This enhancement is activated for the customer by the customer's private network customer service supplementary auxiliary block. This is accomplished with the ETSACRE keyword on the RC:CUSTCB recent change input message. Both ETSBES (set card FF006) and EEDP (set card FF0015) must be present in the switch and activated for the customer.

#### **2.1.15 Flexible Route Selection of '555' Calls Enhancement**

The FRS (Flexible Route Selection) feature permits Centrex customers to specify a list of private facilities to be hunted for routing of predesignated call types. This hunt is triggered by dialing the flexible route access code. Normal digit analysis is performed and then screening for private routes begin. Currently, hard coded checks exist in the FRS code to route 10-digit 555 calls in the most economical manner for free calls. (Prior to equal access, private facilities was not the most economical manner.) Since '555' calls such as Directory Assistance are no longer free calls, this logic no longer applies. Competitive alternates exist and requests have been made to treat 10-digit 555 calls as regular FRS calls.

#### **2.1.16 Automatic Line Insulation Test Enhancement**

The ALIT (Automatic Line Insulation Test) feature provides the means to check for insulation leaks in the insulation of wire, cable sheath, and cable terminals. Currently, testing must be stopped manually with craft intervention. This enhancement provides a new parameter to the TC-TIME input message that is used when initiating ALIT. The new parameter provides the capability of automatically suspending testing at a given point. The capability to restart testing at the point where testing was suspended continues to work in the same manner as manual intervention.

#### **2.1.17 Report on Invalid Input Messages to Custom I/O Enhancement**

This enhancement detects erroneous input messages received for each customized I/O channel and reports these by printing a minor alarm message on a quarter-hour basis. The message is printed at the maintenance TTY. Only one message per channel is printed no matter how many bad input messages were received for that

channel. A maximum of 20 channels can be printed on the quarter-hour alarm message.

### **2.1.18 SD-1A166-05 Dedicated E911 Trunk Enhancement**

This enhancement allows the SD-1A166-05 to be used as a dedicated E911 trunk by defining an ANI request state and the transitions necessary to use this state.

### **2.1.19 Customer Carrier Identification Library Program**

Functionally, this program provides a method to verify customer carrier assignments in 1AE8A and later generics. Operationally, this program processes translations in an office to extract DN and PIC (primary inter-LATA carrier) information. The DN and PIC information is then output to tape for regional processing from which customer PIC assignment information is available.

### **2.1.20 Mapping of Temporary Recent Change Area and Customer Originated Recent Change Blocks by Data Mapping**

Currently, mapping of the TRCA (temporary recent change area) and CORC (customer originated recent change) blocks was only possible with a PDA and/or generic update. An enhancement has been made to DMAPLIB (1 and 2) to also map the TRCA and CORC blocks during a translations update as well. The enhancement is transparent to the craft.

## **2.2 1AE10.02 Generic Update**

### **2.2.1 HILO Capability for CCS7**

The HILO7 (HILO Capability for CCS7) feature enables CCS7 signaling to be done for HILO 4-wire trunks.

The PM01 TTY output message was changed for the HILO7 feature.

### **2.2.2 ITSO/HILO Conversion for CCS7**

The ITSO (Incoming Trunk Service Observing) feature provides the ability to perform service observing on incoming 2-wire trunk traffic that completes to a trunk or line. ITSO also performs service observing on incoming HILO 4-wire trunk traffic that completes to a trunk. This enhancement allows CCS7 2-wire and 4-wire calls to be observed by the Incoming Trunk Service Observing.

### **2.2.3 CCS7 Stream Outage Alarm Enhancement**

This enhancement to the Message Interface Processor feature provides a visual indication of CCS7 stream problems via the APS lamp on the MCC. When a CCS7 stream outage occurs, the APS lamp is lit red and the "CCS7 Traffic Stream Outage" output message is printed. This enhancement also provides the mechanism for having stream alarms, lamps, and messages inhibited during the period from retrofit of 1AE10 to activation of the CCS7 stream.

### **2.2.4 CCS7 Availability Enhancements**

The CCS7 (Common Channel Signaling System Number 7) Availability (C7AV) enhancements are a group of enhancements concerned with Network-Level availability. Network-Level availability concerns are trunks, end offices, access

tandem offices, and post-outage behavior. The C7AV enhancements, such as CCS7 Heartbeat, modify both the ISUP (Integrated Services User Part) and MIP (Message Interface Processor) features.

### **2.2.5 Higher Duplicated Call Store Feature**

This development creates a new duplicated call store area in the high memory spectrum. This new memory area is called HDCS (higher duplicated call store). HDCS has been created as an alternative memory spectrum in which to allocate LHBs (line history blocks) which are required by the LASS, and MSS features. Prior to this development, LHBs were always allocated in the DCS (duplicated call store) memory spectrum. HDCS is optionally available and can be ordered via the 9SHDCS set card. The set card HCSD is used to specify the size of the HDCS spectrum. In an office having HDCS, LHBs (if they are required) will be allocated in the DCS memory spectrum.

### **2.2.6 Digital Carrier Trunk Incoming Continuity and Polarity Diagnostic Enhancement**

This enhancement provides for manually (TTY or trunk test panel) requested CP (continuity polarity) diagnostic tests for incoming DCT (SD-3C329-01) trunks. These tests also test the line side ferrod for nonsaturation in an idle state. The diagnostic TTY output messages (TN01 and TN05) print the test results. The TN05 ATP message prints with the TC2 (Test Code 2) field (set to a 5) indicating only the CP test was performed on the trunk.

### **2.2.7 Selective Carrier Denial**

The SCD (Selective Carrier Denial) feature provides a capability which selectively inhibits certain carrier handled calls from those lines which have been designated as nonpayer subscribers. A line which is denied access to a particular carrier, is routed to error tone or announcement. This function is provided on a per line, per carrier basis. The calls affected by SCD are:

10XXX blocks everything to a denied XXX	DENIED by XXX
1+IDDD	DENIED by Carrier
1+NPA-555-1212	DENIED by Carrier
0+	DENIED by Carrier
00-	DENIED by Carrier
SAC 600, 700, 800, 900	DENIED by Carrier*
1+800	ALLOWED
1+911	ALLOWED
1+411	ALLOWED
1+950	ALLOWED

\* This is changed to ALLOWED in the 1AE10.03 generic program.

### **2.2.8 Denied Service Signature for Local Test Desk Enhancement**

This enhancement provides the denied service signature for the 1/1A ESS local test desk. The denied service signature provides a 1-second burst of dial tone followed by silence when a request to test subscriber line equipment for dial tone is

made. This is done for lines that are denied terminating, denied origination or full denial, thus preventing expensive false dispatches by ARSB (Automatic Repair Service Bureau) Maintenance Centers.

### **2.2.9 Improved Coin Fraud Prevention Feature**

The ICFP (Improved Coin Fraud Prevention) fast feature provides a mechanism to test and administer a coin phone out of service list for lines which fail to properly dispose of a deposit. The feature also provides the capability to take coin phones out of service and places them on the PSPD (permanent signal partial dial) low priority list after printing a new CN04 O/S message. It also attempts to collect the stuck coin after about a minute for all the PSPD coin phones. If successful on the collect, it restores the coin phone to service after printing a CN04 RST message. This also provides an input message (PSG-POHWLN-STC.) to list all out of service coin lines on the high and wet list. The ICPF (FF055) must be present in the switch and activated for the customer.

### **2.2.10 Coin Control Enhancement**

This enhancement provides better resolution for stuck coin determination and the detection of out of adjustment coin relays, as well as to be able to reduce the overall time required for this procedure.

### **2.2.11 Facility Restriction Level Enhancement**

When an ETS (Electronic Tandem Switching) customer dials a DN which results in an attempt to access a facility for which his FRL (facility restriction level) is insufficient, the call is routed to overflow. This enhancement provides a mechanism by which the call could be routed to an announcement or overflow via a different trunk group, rather than the normal overflow trunk group. This call is routed using a new pseudo route index (198), and eliminates the pegging of the count for the normal overflow trunk group, thus providing more accurate information for the proper engineering of the office.

### **2.2.12 Old Style Verify Message Problem Enhancement**

The old style verify message problem enhancement eliminates the entering of an incorrect IDENT value associated with a particular verify input message. This problem may cause either I/O handler error messages to print, or the inappropriate execution of another verify input message that is associated with the actual IDENT value supplied upon input. The enhancement provides for a valid range checking of the IDENT values input.

### **2.2.13 Routing Selected Transmission Control Redesign**

The RSTC (Routing Selected Transmission Control) feature enables the 1A ESS switch to insert gain into trunk-to-trunk transmission paths on a call-by-call basis when the operation of the RCF (Remote Call Forwarding) or SLRCF (Single Line Remote Call Forwarding) features could result in a degradation of transmission. This redesign makes the RSTC feature compatible with the CI (Carrier Interconnect) feature and central offices that have multiple rate centers.

## **2.3 1AE10.03 Generic Update**

### **2.3.1 Selective Carrier Denial Phase II**

The SCD (Selective Carrier Denial) Phase II feature provides additional recent change and verify capabilities for the SCD translator. The SCD—Phase I feature provides a capability which selectively inhibits certain carrier handled calls from those lines which have been designated as nonpayer subscribers. This function is provided on a per line, per carrier basis. The SCD translator is modified with the new phase II RC:SCD: recent change input message. The SCD translator can be verified with the VF:ICSVY input message using the new Phase II *SCD* keyword.

### **2.3.2 Call Wait Tone Enhancement for the Call Waiting Feature**

Previously, if 3-port conference circuits were not available or network blocking occurred in applying call wait tone, the 1A ESS switch connected a caller to busy tone. This operation of the Call Waiting feature has now changed. In the above mentioned cases, REORDER is now given to the caller.

### **2.3.3 Library Enhancement to Pident XLDC**

This enhancement verifies incoming/two-way trunks for proper setup of bits to allow AMA records to be made on inter-LATA terminating trunks. Any configuration of the bits checked in translations which are incorrect or erroneous, generates output messages. These messages provide craft personnel with exact information to investigate and correct any errors. Standard library output messages inform the craft of any error conditions found.

**Note:** Trunks with bits not set properly will not get equal access charges.

### **2.3.4 Automatic Identified Outward Dialing ANI Enhancement**

If the PBX has AIOD (Automatic Identified Outward Dialing), the station DN may be sent to the IC/INC if it is available at the time ANI (Automatic Number Identification) is to be transmitted instead of listed DN. The AIOD ANI enhancement provides the capability for both equal access signaling and operator services signaling. Previously, if a PBX has AIOD, the AIOD number would not be sent to the IC/INC but would be included in the AMA record if available. This enhancement is activated for the office by setting the office options table word 0 bit 5. The default is off.

### **2.3.5 Carrier Interconnect Inhibit Term Inter-LATA AMA**

By utilizing the AMA-BILL-options input message, this enhancement allows the craftsperson to inhibit all terminating unanswered IC/INC AMA records. If it is desired to monitor the records generated by a particular carrier or carriers (up to five), the craftsperson can enter these carriers on a phase protected list such that any TUIC records for these carriers will be recorded, while all other terminating unanswered records are discarded.

### **2.3.6 Calling Line Identification Enhancement**

This enhancement enables network managers to use the CLID (Calling Line Identification) feature to identify the calling line when the home NPA is part of the

dialed digits.

### **2.3.7 CCS7 (ISUP) Continuity Check Modification Enhancement**

Currently, if there are no CCS7 continuity check circuits available for the eighth CCS7 call on a trunk that has been identified for "1 out of 8" continuity checking, the call will be blocked. The optional CCS7 (ISUP) continuity check modification enhancement allows the eighth call to complete if no CCS7 continuity check circuits are available.

### **2.3.8 Global Title Translation Based on Service Feature Enhancement**

The GTT (Global Title Translation) Based on Service Feature enhancement provides the 1A ESS switch the capability of distributing GTT messages to the correct STP pair based on service feature. A capability code defines more than one signaling point. Each office must choose a capability code for those service features needing GTT done by an STP pair other than the home STP. This enhancement relies on the customer's nonlocal STPs to be addressed as a capability code (2STPs have this functionality) from the switching end office and local STP perspective. This enhancement is not applicable if the nonlocal STPs cannot be defined as a capability code.

### **2.3.9 TN08 Output Messages for CCS7 Trunks**

The TN08 output message is modified to include CCS7 signaling. The TN08 is printed in any of the following cases:

- A continuity check failure causes the TN08 to print in both the outgoing and incoming offices.
- A time-out while waiting for ACM (address complete message) causes the TN08 to be printed in the outgoing office.
- Too many, too few, or a bad steering digit received in an IAM (initial address message) causes the TN08 to be printed in the incoming office.

### **2.3.10 Number Service Database Alarm Enhancement**

The 800 Service feature was released in the 10.01 PPU, and introduced the use of a telephone company-owned SCP (Service Control Point) Database which is queried for detailed call handling instructions of 800 calls. The SCP should respond within 3 seconds after the query is made, and should return the 10-digit routing number to the carrier for completion of the call. The Number Service Database Alarm enhancement identifies a failed or unreachable SCP database. As part of the query sent by 800 Services, a bit is set which requests that queries which are unable to be delivered to the database be returned to 800 Service as a UDS (Unit Data Services) message. Currently, 800 Service handles UDS messages by connecting the caller to reorder, since the request for instructions to the SCP was undeliverable. With this enhancement, a TTY minor alarm is printed alerting the craft that there are problems with the switch's communication with the SCP, and giving the reason for return specified in the UDS message.

### 2.3.11 Automatic Call Distribution Customer Split Configuration Protection Enhancement

The ACD (Automatic Call Distribution) CSC (Customer Split Configuration) Protection enhancement provides an automatic means of protecting customer changeable split configurations on the 1A ESS switch. The customer defined ACD split configuration data is protected during any occurrence of a Phase 4 and the first occurrence of a Phase 5.

The ACD CSC Protection enhancement requires a PDA run to change the zeroing code of the VDCS (variable duplicated call store) table, Hotel-Motel Data Accumulation Groups from a Phase 4 zeroing to a Phase 6 only zeroing. On the occurrence of a call store memory shift during retrofits, restarts, or updates, this table, along with the Hotel-Motel Message and Cashier Console Registers VDCS table, is data mapped via an existing utility program.

### 2.3.12 Verify Trunk Network Number Enhancement

The verify TNN (trunk network number) enhancement feature impacts the verify display capabilities associated with the TNN field located in a circuit identification code block of the point code translator. This enhancement provides the verify capabilities to determine which TNN is associated with a given CCS7 (Common Channel Signaling 7) trunk state block address. Modifications are made to the input message VF:RUGRAT: to accept keyword TSBA along with input data representing a CCS7 TSBA. The input TSBA is an address pointer to a TSB (trunk state block). A TSBI (trunk state block index) can then be derived from the position of the TSB within the TSB variable call store structure. The point code translator can then be searched for a 2-word CIC block entry which contains the derived trunk state block index with its associated TNN. The TNN and trunk state block index are displayed by the VF25 output message.

## 2.4 1AE10.04 Generic Update

### 2.4.1 Route Index Loop Prevention

The Route Index Loop Prevention enhancement prevents new RIs (route indexes) from being built in a looped condition (via recent change). When the recent change message RC:RI is input with a RI and NRI (next route index) that cause a loop, a new validity error is output on the TTY.

**Note:** Prior to the 1AE10.04 PPU updating, it is recommended that the XLDC library program should be run to test for any looped RIs.

### 2.4.2 Retrieval of CORC Block Address Enhancement

A CORC (customer originated recent change) block is used to store the remote directory number for interoffice Call Forwarding Variable and Call Forwarding over Private Facilities. The address of this CORC block is difficult to derive manually. This enhancement provides a new input message to retrieve the address and size of the call forwarding CORC block(s) (CFCB) associated with the input DN. The existing TR20 output message is used to print the CORC block address and size in response to the new TAG-CFCB input message. The format of the message is "TAG-CFCB-xxxxxxx.", where xxxxxxx is the 7-digit forwarded base DN.

### **2.4.3 Station DN in the ANI on SSP AIOD Originations**

The SSP (service switching point) ANI (automatic number identification) information provides the station DN through a nondestructive read of the AIOD (automatic identified outward dialing) table. This is an enhancement to the AIOD ANI which is activated for the office by the office option table.

### **2.4.4 Diagnose All OOS Controllers 24-Hour Enhancement**

This enhancement allows a method to include the OOS (out-of-service) controllers in the 3 a.m. REX (routine exercise) of ISPI controllers. Those OOS controllers that pass REX (diagnostic) are returned to the ACT (active state). All ISPI controllers were automatically removed from service with the elimination of the ISPI magic number.

### **2.4.5 Cancel Call Waiting Per Line**

The CCWL (Cancel Call Waiting Per Line) feature is an enhancement to the CCW (Cancel Call Waiting) feature. The CCWL feature provides the ability to assign CCW service as a per line option. The CCW feature and set card FF059 are required.

### **2.4.6 ID01 Output Message Enhancement**

The CCS7 local point code is printed as part of the ID01 output message. The ID01 message is printed hourly or in response to input message WHO-RU-. A 9-digit number is printed representing the network, cluster and member. The point code is retrieved from the PDA location C7OFFICE\_PC.

### **2.4.7 Directory Numbers Associated With Route Indexes Enhancement**

The DNs associated with RIs (route indexes) enhancement allows the craft a means for verifying which DNs are associated with RIs. This enhancement also allows the craft with the verify capabilities to search through an entire office or a specific input range of DNs, for:

- Those DNs which are associated with a specific input RI.
- Those DNs which are associated with a RI which falls within a specific input RI range.

### **2.4.8 Attached Processor System Preconditioning Enhancement**

The preconditioning check is an enhancement to the system update process for 1A APS (Attached Processor System) offices. Loading certain 1A generic features requires prior APS feature activation. Failure to precondition the APS may result in lost AMA revenue and/or misrouted calls. The preconditioning check safeguards against this by verifying that in the presence of such features, if the APS has not been preconditioned, the system update will abort. Currently, the 1A features requiring prior APS conditioning include: AMASE, METS EBRCC, MIP, and OFNS.

### **2.4.9 Data Compression Feature**

The Data Compression feature sends the fast feature bits to the APS so that the APS knows which features are on or off. This feature also enables the APS to send compressed AMA data to a HOC (host collector) when compressed AMA data is

requested by the HOC. The APS can still send noncompressed AMA data when noncompressed AMA data is requested. The compressed AMA data will take less time to be teleprocessed and as a result save money. Set card FF057 defines the Data Compression feature.

## **2.5 1AE10.05 Generic Update**

### **2.5.1 Remote Access Service**

This feature provides the subscribing customers with the capability to access their applicable Custom Calling features from any touch-tone phone in a remote location. Remote access will interface with any CCF (custom calling feature) that has the remote access option. The first application of Remote Access Service is the RACF (Remote Access to Call Forwarding) feature.

### **2.5.2 Remote Access Service Enhancement**

This enhancement makes the Remote Access Service feature more consistent, user friendly, and transparent with the 5ESS switch. This enhancement includes changing the interdigital time-out from 2.5 seconds to 4 seconds, and allowing the # to be used as the end-of-dialing indicator for all announcements. It also includes changing the prompt for the PIN announcement to instruct the customer to dial a zero instead of an \* character and a new number when the customer realizes they have misdialed their home DN. Also, for centrex numbers, the centrex extension announcement was changed to be more informative and user friendly.

### **2.5.3 Remote Access to Call Forwarding**

The RACF (Remote Access to Call Forwarding) feature provides a POTS customer the means to activate or deactivate CFV (Call Forwarding Variable) or CFUP (Call Forwarding Usage Sensitive) from any DTMF (Dual Tone Multifrequency) telephone. This allows a CFV/CFUP customer the convenience of activating/deactivating CFV/CFUP for their home telephone from any location equipped with DTMF signaling. The existing CFV/CFUP features restrict the customer to the use of their home phone for activations or deactivations.

The RACF feature also uses interactive announcements which prompt the customer for the numbers to dial. The forward-to number is voiced back for the customer to confirm. Since the customer is given the chance to verify the number that they dialed, RACF does not make a courtesy call.

The RACF feature is not an independent feature but requires the RAS feature to also be loaded. RAS provides the basic remote access capability for subscribing customers to access selected features assigned to their home phone from a remote telephone. RAS is assigned on a per line basis. Once a customer subscribes to RAS, they can access any feature that has the remote access capability if that feature is available to their home phone. Currently, RACF is the only RAS feature available.

#### **2.5.4 Call Forwarding Don't Answer Capability Enhancement for Foreign Exchange Trunks**

The CFDA (Call Forwarding Don't Answer) capability enhancement allows CFDA to be activated on calls that originate from CMT (combined miscellaneous trunk)/DCT (digital carrier trunk) foreign trunks.

#### **2.5.5 Remote Switching System Ground Start Applique Alarm Enhancement**

The RSS (Remote Switching System) Ground Start Applique Alarm enhancement introduces an alarmed output message to inform the telephone operating company that the RSS requires an updated firmware issue.

### **2.6 1AE10.06 Generic Update**

#### **2.6.1 Simplified Message Service Interface Enhancement**

When SMSI (Simplified Message Service Interface) and MSS (Message Service System) are loaded, SMSI I/O message waiting indicator messages (OP:MWI, RMV:MWI) will be able to activate/deactivate visual MWI for a given 7-digit intraoffice DN contained in the SMSI I/O MWI message.

#### **2.6.2 Combined Trunk Group Usage Enhancement**

The Combined Trunk Group Usage enhancement allows the LASS and RAS features access to the ASC (announcement service circuit) through ATIs (announcement trunk interfaces) assigned in a single trunk group. This enhancement gives offices the flexibility to engineer anywhere from one register [RASRs (remote access service registers) or SLRs (screen list registers) per ATI to two registers (RASR and SLR) per ATI in a shared trunk group.

#### **2.6.3 Improved Network Management Call Gapping Enhancement**

The Improved Network Management Call Gapping enhancement allows Call Gapping on the Home NPA (numbering plan area) in a multiple NPA, multiple Rate Center environment and/or on conflict codes. This enhancement will also allow Call Gapping on a TDIAC (Ten-Digit Intraoffice Calling) type call.

#### **2.6.4 Remote Access Service 5ESS<sup>®</sup> Switch Transparency Enhancement**

The Remote Access Service 5ESS Transparency enhancement gives the RAS customers three chances to dial their PIN (personal identification number). This enhancement will also not require the billing keyword to be input when assigning a PIN, and will allow the PIN to be displayed via a verify message.

#### **2.6.5 SMDR Via 1A APS IOP Enhancement**

The SBVA [SMDR (Station Message Detail Recording) to BCP (Basic Communications Package) via 1A APS] enhancement allows a data facility to receive a message detail record composed of call attempts and related data for cost allocation and telecommunication system management. With the SBVA feature, a copy of SMDR/XMDR records that are sent to the RAO (revenue accounting office) via MDRRAO will be sent to the BCP or equivalent device via the APS. These records are sent over an asynchronous data link in ASCII format. Set card FF061 controls operation of this feature.

### **2.6.6 Outgoing Trunks Call Cutoff Enhancement**

The Outgoing Trunks Call Cutoff enhancement provides a new output message that can be used to detect defective outgoing trunks. These defective outgoing trunks may be causing call cutoffs. Printing the LT01 message with the outgoing trunks phase is controlled by the MISC-FLAG input message. The LT01 output message is output 10 or 11 seconds after a line to outgoing trunk connection has disconnected at the trunk side and the line is still off-hook. This enhancement is only useful when used in conjunction with the SCCS programs to gather and pattern outgoing information retrieved from the LT01 outgoing message.

### **2.6.7 Inhibit Hard-Coded Feature Access Code Enhancement**

The IHFAC (Inhibit Hard-Coded Feature Access Code) enhancement will keep the unprefixed access codes of 72, 73, 74, and 75 from being recognized as feature access codes. Without the IHFAC enhancement, 4-second critical timing may be performed after the digits 72 through 75 are dialed and, if time-out occurs, the appropriate feature activation procedure begins. This can result in unintentional misdials. With the IHFAC enhancement active, access to the Call Forwarding and Speed Calling features must be provided via PACT entries.

## **2.7 1AE10.07 Generic Update**

### **2.7.1 AMASE Verify On/Off Enhancement**

The AMASE (Automatic Message Accounting Standard Entry) VFY (Verification) On/Off enhancement provides the ability to activate/deactivate AMASE/VFY via an input message. This feature also activates AMVF by having the AMASE Verification bit set in the office option table. Since both methods of activation is possible, AMASE/VFY must be deactivated by the same method by which it was activated.

### **2.7.2 Queueing Intraflow Enhancement**

The Queueing Intraflow enhancement provides the option on a per queue basis of giving solid zip tone on calls that intraflow to another queue. These calls are normally given stutter zip tone. This enhancement is activated by setting bit 22 in word 13 (decimal) of the unit type 55 auxiliary block for the queue that the call is intraflowing from.

### **2.7.3 Presubscription for Coin Lines Custom Feature**

The PCL (Presubscription for Coin Lines) Custom feature allows for two different PICs (primary interexchange carriers) to be used when providing service for single coin lines depending upon the digits dialed. The PCL custom feature enables the switch to route 1+ or 011+ inter-LATA calls from a coin line to either the PIC of the line or to the coin line office default carrier in the office option table if the PIC does not have the capability of handling 1+/011+ traffic. 0+, 01+, and 00 inter-LATA coin calls continue to route to the coin line PIC.

### **2.7.4 Inhibit Ring Current Tests on CFDA Calls Enhancement**

The INHRCT (inhibit ringing current test) enhancement is automatically active when this PPU is loaded. This enhancement skips the ringing current failure print (NT02

RC) when the test cannot isolate a specific problem. In the Call Forwarding Don't Answer case, a sectionalization test cannot be performed because the ringing trunk must be idled to execute the test. However, in the CFDA case, the ringing trunk must be reserved for possible reuse when alerting the remote DN. The NT02 RC message is printed with no useful information in the CFDA case. These extraneous prints may be turned back on via MISC-FLAG-S 14.

### **2.7.5 Intraoffice Call Forwarding Limit Treatment Enhancement**

One call may be intraoffice forwarded using Call Forwarding Variable or Call Forwarding Busy Line as many as five times. If the call attempts to forward a sixth time, the intraoffice call forwarding limit is reached. At this point, call forwarding is inhibited and the call attempts to terminate to the base station of the sixth forwarded DN. All nonforwarding terminating treatment applies to this attempt (for example, Call Waiting Termination, Series Completion, etc.).

If the intraoffice call forwarding limit is reached, terminating treatment may be altered by setting the ICFLT translations item (bit 11, word 1) in the office options table. With this option set, a call is routed to busy tone when the intraoffice call forwarding limit is reached. This limit does not apply to the Call Forwarding Don't Answer feature.

### **2.7.6 ISPI Firmware Issue Retrieval and ISPI Heartbeat Enhancement**

The heartbeat tests provided for ISPI controllers run continuously in the background on all active controllers for the following issue of firmware:

- For ASC - MC6A002-A1, Issue 4 and later
- For ISU - MC6A004-A1, Issue 5 and later.

The heartbeat test provides a sanity check on both of the IOP channels connected to the controller. This enhancement also checks the issue numbers of the firmware to determine if heartbeat tests can run for a given controller.

### **2.7.7 Operator Busy Line Verification Enhancement**

The Operator Busy Line Verification enhancement will provide the operator, possibly a TSPS (Traffic Service Position System) attempting to verify a busy line in a ROH (receiver off-hook) condition, with an off-hook supervision response.

### **2.7.8 INWATS Line Class Code Display Enhancement**

The INWATS Line Class Code Display enhancement provides the craft with a means for verifying which LCCs (line class codes) are used for INWATS service. The verification of the USOC (universal service order code) translator is changed to display the condition of the DNINW bit. This bit indicates whether or not each LCC is used for INWATS service. In response to the VF:DNSVY input message, the TR200 output message is used to display the DNINW indicator.

### **2.7.9 Periodic Traffic Count Enhancement**

The PTC (periodic traffic count) enhancement assists maintenance personnel in analyzing repairs made to faulty carrier systems after a failure. The PTC

enhancement will separately accumulate (on an hourly basis) both incoming and outgoing trunk time-outs. Each hour these counts will be printed at the maintenance TTY via (new) output message TN24. The HINTO (first) count will hold the accumulated value of incoming trunk time-outs and the HOUTO (second) count will hold the accumulated value of outgoing trunk time-outs. Each hour these values will be zeroed thus ensuring that the TN24 output message reflects only the most recent hourly collection of counts.

#### **2.7.10 Station Message Detail Recording - Electronic Tandem Switching Account Code Enhancement**

The SMDR (Station Message Detail Recording) - ETS (Electronic Tandem Switching) account code enhancement will optionally provide CDAR (customer dialed account recording) digits in the ETS account code digit field of the SMDR record sent to the customer. This enhancement also removes the ETS account code restriction of dialing a lead account digit in the range of 2 through 9. Also, the recent change restriction that customers must have XMDR (Expanded Message Detailed Recording) to set MDRD not equal to 0 (XMDR recording digits) on CDAR access codes will be removed.

## **2.8 LASS Enhancement Features**

### **2.8.1 1AE10.01 Generic Update**

#### **2.8.1.1 Local Area Signaling Services Conversion**

Feature Conversion provides the capability for existing features to be compatible with CCS7 Signaling. The first feature defined for conversion is LASS (Local Area Signaling Services). Primitives are required to create building blocks for collecting and storing information used by features. The following primitives are converted for CCS7 signaling.

- RCLDN (Retrieval of Calling Line Directory Number) primitive for CCS7 allows the DN and privacy status indicator to be transported to a terminating office by ISUP call processing as part of an IAM (initial address message) when an interoffice call is originated.
- RDLS (Retrieval of Distant Line Status) primitive for CCS7 allows interoffice queries and responses for distant DN status to be sent as noncircuit related messages provided by the TCAP capability.

#### **2.8.1.2 Separation of Automatic Recall/Automatic Callback With Two Line History Blocks**

The separated AR (Automatic Recall) capability allows each LEN/DN in the office to access the LOCDN (last outgoing call directory number) or extension (last party called by the customer). The separated AC (Automatic Callback) capability allows each LEN/DN to access the LICDN (last incoming call directory number) or extension (last party to alert the customer). The separated Automatic Recall (9SAR2) and Automatic Callback (9SAC2) may be obtained as individual features or individual capabilities as a combined feature (9SAR). The Separation of AR/AC feature requires the Two Line History Blocks feature (9S2LHB).

### **2.8.1.3 Automatic Recall/Automatic Callback 5ESS Switch Transparency**

AR/AC (Automatic Recall/Automatic Callback) Transparency Items feature provides transparency of AR/AC with a 5ESS switch. The first change defines the default for the number of ringbacks to the customer to one to be compatible with the 5ESS switch arrangement. This default value may be changed by assigning a different number to set card LARBNM. The second change is if an AR/AC request to a terminating DN is made and a LSRB (Line Status Request Block) has already been allocated, a second LSRB will not be allocated. Instead, the block timer in the already allocated block is reinitialized, and an AMA record is made. This feature is compatible with the AR/AC feature and the Separation of AR/AC With Two Line History Blocks.

### **2.8.1.4 Customer Originated Trace—Basic Service II**

The COT (Customer Originated Trace) Basic Service II provides time and date information to the information already provided as a result of a customer originated trace of the last call received.

### **2.8.1.5 LASS Option Word L Recent Change Enhancement**

The LASS Recent Change Option L enhancement allows the assigning of LASS features more efficiently. Currently, the initial assignment of LASS features to an individual line requires the craft person to specify each LASS feature being allowed and the type of access (usage-sensitive, subscription, or denied). Any LASS feature not assigned at this time defaults to 0 (usage-sensitive). The craft person must deny each feature not wanted. This enhancement allows the setup of a default option word L in the office option table. Recent change uses the default option word L to fill in the unspecified fields.

### **2.8.1.6 LASS Verify for Line Equipment Number Enhancement**

This enhancement generates a display of those LASS features associated with a given LEN provided that the LEN is assigned usage-sensitive, subscription billing, or denied access. This display eliminates the need for randomly choosing the individual LASS features with associated billing until the right combination is displayed. This capability only allows for the display of LASS features designated in option word "L" of the LEN supplementary auxiliary block. No additional software or hardware is required.

### **2.8.1.7 LASS Directory Number Verify Enhancement**

This enhancement provides the LEN verify enhancement to be extended to verify the LASS Usage-Sensitive/Subscription Billing features associated with the DN. The option word L of the LEN supplementary auxiliary block is required to be built in LUCS.

### **2.8.1.8 Coin Line Option for Automatic Callback**

The Coin Line Option for Automatic Callback feature provides an office the option of denying callbacks to a coin line in the operation of the AC feature. This feature should assist in minimizing any loss of coin revenue that might occur through the use of the AC feature.

### **2.8.1.9 Screen Lists in Higher Unduplicated Call Store**

The Screen Lists in HUCS (Higher Unduplicated Call Store) feature is **nonoptional**. Currently, the LASS screen lists are restricted to the LUCS (lower unduplicated call store). The new capability will allocate screen lists in HUCS if the memory is available. If no memory is available in HUCS, the screen lists will be built in LUCS. This will be done internally by RC when the screen lists are accessed.

## **2.8.2 1AE10.02 Generic Update**

### **2.8.2.1 Higher Duplicated Call Store for Line History Blocks**

The HDCS (higher duplicated call store) feature for LHBs (line history blocks) uses a new DCS (duplicated call store) area in the high memory spectrum. The memory to be used for this new duplicated call store area is presently designed as the HUCS (higher unduplicated call store) growth area. This new duplicated call store area will be called HDCS.

The HDCS memory spectrum is being provided as an alternative call store area to build LHBs. Prior to this development, LHBs were always allocated in the DCS memory spectrum. In an office where this feature is loaded, LHBs will be built in the HDCS memory spectrum rather than in the DCS memory spectrum. Thus, valuable DCS memory is made available for other uses.

### **2.8.2.2 LASS Bimodal**

The LBMO (LASS Bimodal) capability provides for a smooth transition between CCIS6 and CCS7 direct signaling messages. This allows the office to convert from a CCIS6 network to a CCS7 network. This capability also allows an office to continue to use CCIS6 direct signaling for LASS. This enables the office to load the 1AE10 generic program, possibly for a desirable feature set, but not convert to CCS7 signaling for LASS.

The LASS Bimodal capability is controlled by set card FF051.

### **2.8.2.3 Single Activation Selective Call Forwarding**

The SCF (Selective Call Forwarding) feature is one of the LASS subfeatures developed for 1AE9. The SCF customers are required to subscribe to the CFV (Call Forwarding Variable) feature. To activate SCF for 1AE9, the SCF customer has to activate both the CFV feature and the SCF feature. The Single Activation Selective Call Forwarding feature allows the SCF customer to activate SCF with one activation request. That is, the SCF customer is prompted for the remote DN before editing the SCF screening list. The SCF customers no longer have to subscribe to CFV. Customers may now subscribe to either SCF or CFV or both features. However, only one of these features may be activated at any time.

### **2.8.2.4 Selective Call Forwarding Centrex Enhancement**

The characters \* and # are used as special characters in the LASS screening list editing session. The character # means cancel timing for next digit and start processing the DN entered. The character \* means cancel timing for next digit and do not process the digits entered. Presently, SCF centrex customers are unable to use \* and # during the remote DN entering process because these two

characters may be used in the dialing plan (for example, dial out access code = \*9). This Selective Call Forwarding Centrex enhancement allows the centrex customers to tailor the \* and # characters to fit their needs. Two bits are defined in centrex common block to specify the \* and # options. These bits are set as follows:

- 0 0 \* and # are not used to cancel timing (default).
- 0 1 \* is used to cancel timing and ignore the digits entered.
- 1 0 # is used to cancel timing.
- 1 1 \* and # are both used to cancel timing.

### **2.8.2.5 Screen List Editing Privacy Custom Feature**

In the standard offering of SLE (Screen List Editing), entries added to a customer's screening list from the line history block are always marked private. If set card FF050 is assigned, SLEPR marks an entry made from the LHB as private only if the privacy indicator is set. Otherwise, the entry from the LHB will be marked as public on the screening list. Public entries are voiced back while private entries are not. SLEPR (Screen List Editing Privacy) is a custom feature controlled by FF050. SLEPR requires 9SSLE, 9SISPI, and 9SVM11 feature groups and 9FSLE feature to be loaded.

### **2.8.3 1AE10.03 Generic Update**

#### **2.8.3.1 Total Separation of Selective Call Forwarding**

The SCF (Selective Call Forwarding) is one of the many features provided by LASS. SCF was first introduced as a feature with the requirement that CFV (Call Forwarding Variable) must be active. This requirement was changed so that now complete separation of SCF allows SCF and CFV to be active concurrently. Complete separation of SCF stores the last valid and confirmed remote DN. The remote DN is not permanently stored if the customer's screening list is empty.

#### **2.8.3.2 Automatic Call Back Two-Level Announcement**

The AC (Automatic Call Back) Two-Level Announcement feature provides the AC customer, by voicing back, the last incoming called DN if not marked private, and optionally provides the time and date the call was received. The AC customer will then be requested to dial "1" to activate the AC request or hang up to cancel.

#### **2.8.3.3 Customer Originated Trace Two-Level Announcement**

The COT (Customer Originated Trace) Two-Level Announcement feature informs the customer, by voicing back, that the COT feature has been accessed and optionally provides the associated COT charges. The COT customer will then be requested to dial "1" to activate the trace or hang up to cancel.

#### **2.8.3.4 LASS Transparency Group A Enhancements**

LTAE (LASS Transparency Group A Enhancements) is intended to clarify and change the requirements for some of the existing LASS features. The reason for these changes is to provide transparent feature offerings for both the 1A ESS and 5ESS switches.

LTAE consists of the following parts:

- Verify at the far end office that the service key parameter contains both a 10-digit calling party number and 10-digit destination DN. If not, send a response message containing a Return Error Component with an Error Code of Unexpected Data. This change is made for requests for terminating and originating characteristics.
- If the DN was invalid (unassigned in the terminating switch), the response message is Return Error with an Error Code of Data Unavailable. This response also contains the DN to line services type mapping (DN-LSTM) parameter with its DN match field set to No Match. The originating switch uses this information to determine if short- or long-term denial should be returned to the calling party.
- Both the RBOCs and Bellcore have requested uniqueness in the multiline hunt groups. To be transparent with the 5ESS switch offering, this change is implemented on the 1A ESS switch as word 0 bit 6 in the office options translator. When this bit is set, queries to nonunique MLHG members are allowed, and when reset, these queries are denied.

#### **2.8.3.5 Uniqueness Indicator in the Calling Party Number Parameter Enhancement**

As part of the LASS conversion for CCS7 signaling (10.01 PPU), the RCLDN (Retrieval of Calling Line Directory Number) primitive was updated to provide the calling party information to the terminating office of CCS7 interoffice calls. The calling party information is used by the LASS features and is provided to the terminating office via parameters in the IAM (initial address message). This information includes the calling party directory number, privacy status, and uniqueness status. The uniqueness status specifies whether the calling directory number, sent in the CGPN parameter, is an unique (or true) directory number.

RCLDN puts the calling party directory number and the privacy status in the CGPN (calling party number) parameter and the uniqueness status in the SLI (supplementary line information) parameter. The Uniqueness Indicator in the CGPN parameter enhancement eliminates usage of the SLI parameter and, instead, puts the uniqueness status in the CGPN parameter of the IAM. The calling party directory number and the privacy status is still provided in the CGPN parameter.

#### **2.8.4 1AE10.04 Generic Update**

##### **2.8.4.1 Dequeue Capability**

DQ (Dequeue Capability) provides the means to notify a terminating switch to remove a camp-on entry from a queue. This capability is provided to correctly interface with the 5ESS switch and other vendors' switches that use queues to hold calling directory numbers camped-on to a particular line. DQ is incorporated into the RDLS (retrieval of distant line status) primitive that retrieves distant line status information for client features.

#### **2.8.4.2 LASS Group D Enhancement**

The LASS Group D enhancement consists of the following:

- (a) For the AR/AC feature, currently there are two different originating scan rates (set card LASTRB specifies the amount of time for scanning before first ring back and set card LARBST specifies the scanning rate after ring back goes unanswered). This enhancement provides a primary scan rate specified by set card LASTRB before ring back. Following an unanswered ring back, there is a delay specified by set card LARBST, and then scanning resumes using the LASTRB scan rate.
- (b) The 5ESS switch does not assign a lead DN to a multiparty (4- or 8-party) group while the 1A ESS switch does assign a lead DN to the group. The LASS (1A ESS switch) features take advantage of this DN to deliver calling party number information to the called customers. The operating companies want the 1A ESS and 5ESS switches to offer transparent offerings of the LASS features. Because of the operating companies' request, the 1A ESS switch is changed to not send the calling party number information for DNs in multiparty groups.
- (c) The operating companies have requested that our switches always deliver 10 digits to the customer premises equipment for nonprivate calling party originations. This delivery includes both local calls and extension dialed centrex calls. This information is delivered only if the ICLID feature is assigned to the called DN and the calling party DN is available.

#### **2.8.4.3 Customer Originated Trace Call Waiting Indicator Custom Feature**

The COT (Customer Originated Trace) Call Waiting Indicator Custom feature reflects the value of the call-waiting indicator of the Line History Block in the COT output message. If the COT call waiting indicator feature is turned on and the LCDN is a call waiting DN, then the call-waiting indicator bit will be set. This feature makes the 1A ESS switch offering of COT transparent with the 5ESS switch offering.

#### **2.8.4.4 LASS Privacy Enhancements**

The LASS Privacy enhancement consists of interactions between the AR/AC feature and the Privacy feature. The interactions were changed by the Per Call Privacy Toggle and Saving Privacy Status.

The Per Call Privacy Toggle feature uses a toggle access code instead of the activation/deactivation code used in earlier generics. When a customer dials the per-call privacy toggle access code, the privacy status for that call is changed to the opposite of their permanent privacy status value (for example, if the permanent privacy status is public, the privacy status for this call is private).

In conjunction with the preceding, the privacy status is also saved in the outgoing line history block. Therefore, if the customer activated an AR, the call that is generated by the AR request has the same privacy status as the original call.

#### **2.8.4.5 LASS Transparency Group B Enhancements**

For the AR/AC and SLE features, TCAP (Transaction Capabilities Application Part) provides the interface between the originating and terminating offices for noncall related messages. The TCAP protocol requires initiation of a timer in the originating switch to wait for the response from the terminating switch. This timer will be an office option with a range of 1 to 6 seconds and stored in the Office Options Table Translator (bits 7 through 9 in word 0).

#### **2.8.4.6 Verify of the LASS Feature Restrictions Access on a Line Enhancement**

This enhancement allows the craft a means for verifying a DN's ability to access LASS features (AR, COT, DA, SCR, SCF, AC and AR2). The enhancement will combine the restrictions at all levels and show whether a DN is denied access, or what type of billing (usage-sensitive, subscription) a DN is assigned for each individual LASS feature. A simple verify request will either use the PACT or the CTXDI, CLSI translator, and option word L of the LEN supplementary auxiliary block to determine a DN's accessibility and/or billing type for each individual LASS feature.

#### **2.8.4.7 Option Word L Bit Map Enhancement**

This is an enhancement to the APT47 library package that will provide the following functions:

- For offices with single line history blocks (9S2LHB=0), the AR field of the supplementary LEN auxiliary block option word L is the only used field. The three possible fields are AR2, AC, and AR. In order for the line recent change to work correctly, the AR2 and AC fields must be marked denied. Running the APT47 library program will mark these fields denied for all lines found having option word L.
- For offices with two line history block (9S2LHB=1), the AR2 and AC field in option word L of the supplementary auxiliary block are used and the AR field is unused. When the APT47 program is run, the AR field will be marked denied for all lines found having option word L.
- For offices that loaded a PDA run that changes 9S2LHB=0 to 9S2LHB=1, the APT47 library program provides a mapping function that, after combining all levels of restriction and the current value for the AR field at option word L of the supplementary LEN auxiliary block, maps this data into the AR2 and AC fields.

### **2.8.5 1AE10.05 Generic Update**

#### **2.8.5.1 Directory Number to Line Service Type Mapping Enhancement**

This enhancement aligns the 1A ESS switch LASS protocol with the 5ESS switch protocol.

#### **2.8.5.2 Option Word L Removal Enhancement**

If a line is restricted access to all LASS features at the PACT (prefixed access code translator), CTXDI [centrex digit interpreter (for CTX lines)], and/or class of service

information levels, option word L in the LEN supplementary auxiliary block will not be built. This access checking is performed when running an RC:LINE: new or change message. This results in a savings of allocated call store words.

### **2.8.5.3 Request for Terminating Scanning Feature**

This feature provides the 1A ESS switches the capability to request the terminating switch to monitor the busy/idle status of the LCDN (last call directory number). This feature is designed for 1A ESS switches that are in a multioffice LASS complex with switches that already have the terminating scanning capability. Set card FF060 defines this feature.

### **2.8.5.4 Selective Call Forwarding Announcement Enhancement**

This enhancement provides the Single Activation of SCF (Selective Call Forwarding) user and Total Separation of SCF user with more information. First, the user is told that their SCF service is now off, then that no resources are available, and then given dial tone.

### **2.8.5.5 LASS Call Trace Enhancement**

The LASS Call Trace enhancement changes the printing of CT03 and CT04 messages when calls terminate to traced DNs. The CT03 message will only be printed for traced intraoffice calls and the CT04 message will be printed for interoffice calls. The CT04 will include both the incoming TNN (trunk network number) and the calling DN if it is available.

### **2.8.5.6 LASS AR/AC Idle/Call Waiting Status Enhancement**

The AR/AC Idle/Call Waiting Status feature is available as a special feature. This feature will respond idle for the initial query if the called party is busy in a stable state and has call waiting. Subsequent queries (delayed processing queries) will return busy. Prior to this special feature, busy was returned for all calls that were off-hook. Set card FF058 is required for this enhancement.

## **2.8.6 1AE10.06 Generic Update**

### **2.8.6.1 Multiparty LASS Restriction Enhancement**

The Multiparty LASS Restriction enhancement restricts two-party and multiparty lines from using the LASS features [access codes] without requiring changes to be made to the class of service information translations.

### **2.8.6.2 Ignore Match Status Enhancement**

For an AR/AC activation to an interoffice DN, the RDLS (retrieval of distant line status) primitive sends a TCAP query message to the FEO (far end office) requesting terminating-initial information. This enhancement lets AR/AC ignore a match status of "no match" when the line service type is multiline hunt. If the queried DN is a multiline hunt DN, the 1A ESS switch always returns a line service type of "multiline hunt" and a DN match status of "match" in the DN to line service type mapping parameter of the return result component in the TCAP response message.

### **2.8.6.3 Single Level AR/AC Announcement Enhancement**

The Single Level AR/AC Announcement enhancement provides an announcement for single level AR/AC customers who are denied activation because of characteristics of the far end line. The characteristics of the far end line include CFV, SCF with the calling DN on the list, or the far end line is temporarily out of service with a DN match status of match. Pseudo route index 195 needs to be built to provide the announcement.

### **2.8.7 1AE10.07 Generic Update**

#### **2.8.7.1 Selective Call Forwarding Message Enhancement**

The Selective Call Forwarding Message enhancement changes the announcement to prompt the customer for confirmation of the remote DN. This is done to become transparent with the 5ESS switch announcement. The new message is as follow:

Your calls will be forwarded to {remote DN digits}. If the number is correct, dial one. If this number is not correct dial zero. Please dial now.

## **2.9 Library Programs**

### **2.9.1 Simultaneous Trunk Conversion via Automated Recent Change**

This program provides an automated method for two 1A ESS switches, or one 1A ESS switch and one 5ESS switch, to simultaneously convert trunks to support CCS7 signaling. Operationally, this package, via automated recent change, enables two 1A ESS switches to convert their trunks, update their databases, and test and verify the voice path. In addition, this package also enables a 1A ESS switch and a 5ESS switch (using their version of this package), via automated recent changes, to convert their trunks, update their databases, and "test and verify" the voice path between the switches. At the completion of "trunk conversions", the converted trunks in both switches can be placed in a predetermined state. Ordering information for the 1A ESS switch must be taken from J6A002AC-1 under package name "APT44, List 44".

### **2.9.2 1AE8A to 1AE10 Retrofit**

This program and documentation provides a method to skip a generic in the 1A ESS switch retrofit procedure primarily through translation data mapping control enhancements. Operationally, this package enables 1A ESS switches, currently on any supported 1AE8A PPU, to retrofit to any supported 1AE10 PPU. Ordering information for the 1A ESS switch is available from J6A002AC-1 under package name "APT45, List 45".

### **2.9.3 LASS Feature Support**

This package contains a program (SCFMAP) that supports the initialization of LASS features that have been loaded in a 1AE10 switch. Operationally, this software maps translations associated with the supported LASS features after the features have been loaded in a switch. Ordering information for the 1A ESS switch must be taken from J6A002AC-1 under package name "APT47, List 47".

Listed are the SCFMAP tests and the feature supported by each:

- Test 1 - Designed to map Call Forwarding Variable (CFV) to CFV and Selected Call Forwarding (SCF). This is needed for switches planning to retrofit or update to 1AE10.02 or later generics.
- Test 2/3 - Designed to map Automatic Recall (AR) to AR and Automatic Callback. This is needed for switches planning to retrofit or update to 1AE10.01 or later generics.

### **3. HARDWARE**

The following changes and additions have been made for the 1AE10 generic program. For detailed hardware engineering requirements associated with each feature, see the COEES Information System.

The hardware discussed in sections 5.1 through 5.7 is specifically required by the MIP (Message Interface Processor) feature to provide the CCS7 signaling capability. Thus, any feature that uses CCS7 signaling requires this hardware.

#### **3.1 Common Network Interface Ring Node Frame**

The CNI (common network interface) ring node frame is the physical interface to the signaling network for all user applications. The CNI ring node frame contains the hardware and software needed to implement CCS7 communication protocol functions that are common to all switching applications.

The CNI ring node frame consists of nodes containing microprocessors that are programmed to perform the required functions. The 1A ESS switch CNI ring node frame consists of a duplicated RPCN (ring peripheral controller node), a duplicated DLN (direct link node), and up to five pairs of CCS7 LN (link nodes). These nodes are located on an AT&T 3B interface unit and a link node unit mounted on a CNI ring node frame. The RPCN and the DLN are connected to the APS via DSCH (dual serial channels). The LNs are connected to the modems on the DFA (digital facility access) rack frame.

#### **3.2 Direct Link Node**

The function of the direct link node is to:

- (a) Provide a high-speed link for delivering CCS7 messages to and receiving messages from the CNI ring node frame.
- (b) Create the connection capability to send messages to other nodes on the CNI ring node frame.

#### **3.3 Ring Peripheral Controller**

The RPC (ring peripheral controller) transports internal control messages between the APS subsystem and the CNI ring node frame. It provides administrative and maintenance support for the CNI ring. It creates an interface for maintenance routines that are used to restore, remove, diagnose, and initialize CNI ring node frame hardware.

### **3.4 Link Node**

The LN (link node) provides the physical interface to the data links for transmitting and receiving messages.

### **3.5 Digital Facility Access Rack Frame**

The DFA (digital facility access) rack frame contains DFA units that provide the interface between the CNI ring node frame and the transmission facility. The DFA units are ordered separately from the CNI DFA rack frame but will be factory mounted to the frame. A maximum of two DFA units can be furnished for the CCS7 feature. One DFA unit will support four pairs of LNs on the CNI ring node frame.

### **3.6 Attached Processor System**

The CNI ring node frame homes on the APS (Attached Processor System). The APS provides the capability to initialize, monitor, administer, and maintain the CNI ring node frame.

The APS consists of a duplicated AT&T 3B computer and duplicated API (Attached Processor Interface) units that connect the DMA (direct memory access) channels of the 1A and 3B computers. For additional information on the APS and its memory requirements, refer to COEES Information System document, Index 21.

### **3.7 1A Processor**

The 1A Processor subsystem interfaces the MIP call processing subsystem to the APS to provide the message transfer. This subsystem includes the API hardware.

## **4. FIRMWARE**

New firmware is required in the API (Attached Processor Interface) for the 1AE10 generic program. New firmware is also required in the CNI ring node frame. For detailed firmware, see the COEES Information System.

## **5. SWITCHING CONTROL CENTER SYSTEM GENERIC REQUIREMENTS**

The SCCS (Switching Control Center System) Issue 2BSC11.2 is compatible with the 1AE10 generic program.

## 6. DOCUMENTATION

The documents listed below refer to the features covered in this network planning letter. These documents are now available.

<b>TABLE B</b>	
<b>DOCUMENT NUMBER</b>	<b>TITLE</b>
231-301-005	APS GENERAL SYSTEM APPLICATION
231-301-302	CCS7 TRUNK MAINTENANCE
231-318-325	LINE RECENT CHANGE FORMATS*
231-318-334	TRUNK RECENT CHANGE FORMATS
231-318-336	RATE AND ROUTE RECENT CHANGE FORMATS
231-318-340	LASS RECENT CHANGE IMPLEMENTATION PROCEDURES
231-318-355	CENTREX RECENT CHANGE FORMATS
231-318-375	CCS7 RECENT CHANGE IMPLEMENTATION PROCEDURES AND TRUNK CONVERSION
231-318-376	CCS7 SSP TRANSLATION IMPLEMENTATION PROCEDURES†
231-390-063	AMA FEATURE DOCUMENT, Appendix 1
231-390-069	AMASE AND METS FEATURE DOCUMENT
231-390-207	TRAFFIC MEASUREMENT FEATURE DOCUMENT‡
231-390-236	SELECTIVE CALL FORWARDING FEATURE DOCUMENT
231-390-239	AR/AC LASS FEATURE DOCUMENT§
231-390-241	COT LASS FEATURE DOCUMENT
231-390-410	ITSO FEATURE DOCUMENT
231-390-500	CCS7 GENERAL DESCRIPTION FEATURE DOCUMENT¶
231-390-502	ISUP CCS7 FEATURE DOCUMENT**
231-390-508	TCAP CCS7 FEATURE DOCUMENT
231-390-509	SSP CCS7 FEATURE DOCUMENT††
231-390-510	800 SERVICE CCS7 FEATURE DOCUMENT
See footnotes on next page.	

<b>TABLE B (CONTD)</b>	
<b>DOCUMENT NUMBER</b>	<b>TITLE</b>
231-390-515	LASS CCS7 GENERAL DESCRIPTION FEATURE DOCUMENT†‡
231-390-523	TOTAL SEPARATION SELECTIVE CALL FORWARDING FEATURE DOCUMENT
231-361-025	APS GROWTH
231-361-026	CCS7 CNI RING IMPLEMENTATION GUIDE (AP3 B)
231-368-019	CCS7 CNI RING DESCRIPTION§§
231-368-020	APS OPERATION MAINTENANCE RECOVERY (AP3 B) USER GUIDE
254-201-002	API FRAME DESCRIPTION
254-251-016	API FRAME TOP
<p>* Line Recent Change Formats also include separation of automatic recall with two line history blocks.</p> <p>† CCS7 SSP Translation Implementation Procedures also include OFNS (Old Format AMA Number Services).</p> <p>‡ Traffic Measurement feature document includes all 1A ESS switch traffic information.</p> <p>§ AR/AC LASS CCS7 feature document includes coin line option for automatic callback, separation of automatic recall with two line history blocks, and 5ESS switch transparency.</p> <p>¶ CCS7 feature document includes description of CNI ring node frame and MIP.</p> <p>** ISUP CCS7 feature document includes HILO conversion.</p> <p>†† SSP CCS7 feature document also includes OFNS.</p> <p>‡‡ LASS CCS7 feature document includes LEN/DN verify, optional word L, RDLS (retrieval of distant line status), RCLDN (retrieval of calling line DN), screen lists in HUCS (higher unduplicated call store), and line history in HDCS (higher duplicated call store).</p> <p>§§ CCS7 CNI Ring Description also includes the DFA rack frame.</p>	

<b>TABLE C</b>	
<b>FEATURE</b>	<b>SYSTEM ENGINEERING DOCUMENT INDEX</b>
MIP (Message Interface Processor)	60
ISUP (Integrated Services Digital Network User Part)	60
Call Gap Enhancement	60
Master Directory Number	60
Recent Change Macro Enhancement	60
SSP (Service Switching Point)	60
OFNS (Old Format AMA Number Services)	60
800 Services	60
TCAP (Transaction Capability Application Part)	60
LASS (Local Area Signaling Services)	38
Coin Line Option for AC (Automatic Callback) Feature (ARCE) (LASS)	38
HUCS (Higher Unduplicated Call Store) (LASS)	38
RAS (Remote Access Service)	71
RACF (Remote Access to Call Forwarding)	71
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## 7. SCHEDULES FOR AVAILABILITY

The 1AE10 generic program is available now.

## 8. ACRONYMS

AC	- Automatic Callback
ACD	- Automatic Call Distribution
ACG	- Automatic Call Gap
ACM	- Address Complete Message
AIOD	- Automatic Identified Outward Dialing
AMA	- Automatic Message Accounting
AMASE	- Automatic Message Accounting Standard Entries
ANI	- Automatic Number Identification
API	- Attached Processor Interface
APS	- Attached Processor System
AR	- Automatic Recall
ASC	- Announcement Service Circuit
AT	- Access Tandem
ATI	- Announcement Trunk Interface
BCP	- Basic Communications Package
CCF	- Custom Calling Feature
CI	- Carrier Interconnect
CCIS	- Common Channel Interoffice Signaling
CCITT	- International Telegraph and Telephone Consultative Committee
CCS7	- Common Channel Signaling System 7
CCW	- Cancel Call Waiting
CCWL	- Cancel Call Waiting Per Line
CDAR	- Customer Dialed Account Recording
CFBL	- Call Forwarding Busy Line
CFDA	- Call Forwarding Don't Answer
CFO	- Call Forwarding Outside
CFPF	- Call Forwarding Over Private Facilities
CFV	- Call Forwarding Variable
CIC	- Circuit Identification Code
CIR	- Customer Information Release
CIS	- COEES Information System
CLID	- Calling Line Identification
CMT	- Combined Miscellaneous Trunk

CNI - Common Network Interface  
COEES - Central Office Equipment Engineering System  
CORC - Customer Originated Recent Change  
COT - Customer Originated Trace  
CPE - Customer Premises Equipment  
CRI - Continuity Recheck Incoming  
CTO - Call Transfer Outside  
CTX - Centrex  
CTXDI - Centrex Digit Interpreter  
DA - Distinctive Alerting  
DCS - Duplicated Call Store  
DCT - Digital Carrier Trunks  
DDD - Direct Distance Dialing  
DFA - Digital Facility Access  
DLN - Direct Link Node  
DMA - Direct Memory Access  
DN - Directory Number  
DQ - Dequeue Capability  
DSCH - Dual Serial Channel  
EA - Equal Access  
EAEO - Equal Access End Office  
EBRCC - E911 Bulk Recent Change  
ETS - Electronic Tandem Switch  
FEO - Far End Office  
FRS - Flexible Route Selection  
FX - Foreign Exchange  
GSC - Group Speed Call  
GTT - Global Title Translation  
HDCS - Higher Duplicated Call Store  
HILO - High Impedance at the Modulator/Low Impedance  
at the Demodulator  
HOC - Host Collector  
HUCS - Higher Unduplicated Call Store  
IAM - Initial Address Message  
IC - Interexchange Carrier  
ICFLT - Intraoffice Call Forwarding Limit Treatment  
ICLID - Individual Calling Line Identification  
IHFAC - Inhibit Hard-Coded Feature Access Code

INHRCT - Inhibit Ring Current Tests  
INWATS - Inward WATS  
ISDNUP - Integrated Services Digital Network User Part  
ISPI - Intelligent Simplex Peripheral Interface  
ISU - ICLID Service Unit  
ISUP - Integrated Services User Part  
ITSO - Incoming Trunk Service Observing  
LASS - Local Area Signaling Services  
LATA - Local Access and Transport Area  
LBMO - LASS Bimodal  
LCC - Line Class Codes  
LCDN - Last Call Directory Number  
LEN - Line Equipment Number  
LHB - Line History Block  
LN - Link Node  
LUCS - Lower Unduplicated Call Store  
METS - Multientry Teleprocessing System  
MF - Multifrequency  
MIP - Message Interface Processor  
MSC - Message Service Center  
MSS - Message Service System  
MTP - Message Transfer Part  
MWI - Message Waiting Indicator  
NPA - Numbering Plan Area  
NRI - Next Route Index  
OFNS - Old Format AMA Number Services  
OLC - Outgoing Load Control  
OOS - Out-of-Service  
OSI - Open System Interconnection  
PAM - Pass Along Messages  
PCL - Presubscription for Coin Lines  
PIC - Primary Interexchange Carrier  
PIN - Personal Identification Number  
POP - Point of Presence  
PPU - Periodic Partial Update  
PTC - Periodic Traffic Count  
PTS - Per Trunk Signaling  
RA - Remote Access

RACF - Remote Access to Call Forwarding  
RAO - Revenue Accounting Office  
RAS - Remote Access Service  
RASR - Remote Access Service Registers  
RC - Recent Change  
RCLDN - Retrieval of Calling Line Directory Number  
RDLS - Retrieval of Distance Line Status  
RI - Route Index  
ROH - Receiver Off-Hook  
RPC - Ring Peripheral Controller  
RPCN - Ring Peripheral Controller Node  
RSS - Remote Switching System  
RTM - Ready To Manufacture  
SASCF - Single Activation Selective Call Forwarding  
SBVA - SMDR to BCP via 1A APS  
SCCP - Signaling Connection Control Part  
SCCS - Switching Control Center System  
SCF - Selective Call Forwarding  
SCR - Selective Call Rejection  
SLE - Screen List Editing  
SLEPR - Screen List Editing Privacy  
SLR - Screen List Registers  
SMDR - Station Message Detail Recording  
SMSI - Simplified Message Service Interface  
SS7 - Signaling System 7  
SSP - Service Switching Point  
TCAP - Transaction Capability  
TDIAC - Ten-Digit Intraoffice Calling  
TML - Trunk Maintenance List  
TNN - Trunk Network Number  
TSCF - Total Separation of Selective Call Forwarding  
USOC - Universal Service Order Code  
UUI - User to User Information  
VPA - Voice Path Assurance  
WATS - Wide Area Telephone Service  
XMDR - Expanded Message Detailed Recording.